

APPEAL NO. 18-13592-EE

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IN THE UNITED STATES COURT OF APPEALS  
FOR THE ELEVENTH CIRCUIT

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DREW ADAMS,  
Plaintiff-Appellee,

v.

THE SCHOOL BOARD OF ST. JOHNS COUNTY, FLORIDA  
Defendant-Appellant.

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On Appeal from the United States District Court  
for the Middle District of Florida, Jacksonville Division  
District Court No. 3:17-cv-00739-TJC-JBT

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**APPELLANT'S APPENDIX IN SUPPORT OF INITIAL BRIEF  
VOLUME IV**

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**DE 41-7**

UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF FLORIDA  
JACKSONVILLE DIVISION

DREW ADAMS, a minor, by and through  
his next friend and mother, ERICA  
ADAMS KASPER,

Plaintiff,

v.

Case No.: 3:17-cv-00739-TJC-JBT

THE SCHOOL BOARD OF ST. JOHNS  
COUNTY, FLORIDA; TIM FORSON, in his  
official capacity as Superintendent of  
Schools for the St. Johns County School  
District; and LISA KUNZE, in her official  
capacity as Principal of Allen D. Nease High  
School,

Defendants.

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DECLARATION OF MICHAEL P. SPELLMAN

I, Michael P. Spellman, pursuant to 28 U.S.C. §1746, declare as follows:

1. I am over the age of eighteen (18), am of sound mind, and am competent to testify to the matters set forth herein. I give the following information of which I have personal knowledge, both freely and truthfully and without any threat of coercion or promise of reward.

2. I am an attorney with Sniffen & Spellman, P.A., and counsel for the St. Johns County School District in this litigation. I am licensed to practice law in the State of Florida, and admitted to practice before this Court. I make this declaration in support of Defendants' Response to Plaintiff's Motion for Preliminary Injunction.

3. Attached as Exhibit 1 is a true and correct copy of the Expert Declaration of Paul W. Hruz, M.D., Ph.D, Doc. 149-9, filed in *Carcano, et al., v. McCrory, et al.*,

Case No. 1:16-CV-00236-TDS-JEP, and *United States of America v. State of North Carolina, et al.*, Case No. 1:16-CV-00425-TDS-JEP, United States District Court, Middle District of North Carolina.

4. Attached as Exhibit 2 is a true and correct copy of the Declaration of Quentin L. Van Meter, M.D., Doc. 149-10, filed in *Carcano, et al., v. McCrory, et al.*, Case No. 1:16-CV-00236-TDS-JEP, and *United States of America v. State of North Carolina, et al.*, Case No. 1:16-CV-00425-TDS-JEP, United States District Court, Middle District of North Carolina.

5. Attached as Exhibit 3 is a true and correct copy of the Declaration of Allan M. Josephson, M.D., Doc. 149-11, filed in *Carcano, et al. v. McCrory, et al.*, Case No. 1:16-CV-00236-TDS-JEP, and *United States of America v. State of North Carolina, et al.*, Case No. 1:16-CV-00425-TDS-JEP, United States District Court, Middle District of North Carolina.

6. Attached as Exhibit 4 is a true and correct copy of the Declaration of Lawrence S. Mayer, M.D., M.S., Ph.D., Doc. 149-12, filed in *Carcano, et al., v. McCrory, et al.*, Case No. 1:16-CV-00236-TDS-JEP, and *United States of America v. State of North Carolina, et al.*, Case No. 1:16-CV-00425-TDS-JEP, United States District Court, Middle District of North Carolina.

7. Attached as Exhibit 5 is a true and correct copy of Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), *Gender Dysphoria* (2013).

8. Attached as Exhibit 6 is a true and correct copy of American Psychological Association, *Answers to Your Questions: About Transgender People, Gender Identity, and Gender Expression* (2014), available at <http://www.apa.org/topics/lgbt/transgender.aspx>.

9. Attached as Exhibit 7 is a true and correct copy of American College of Pediatricians, *Gender Dysphoria in Children* (June 2017), available at <https://www.acped.org/the-college-speaks/position-statements/gender-dysphoria-in-children>.

10. Attached as Exhibit 8 is a true and correct copy of The New Atlantis, A Journal of Technology & Society, *Sexuality and Gender: Findings from the Biological, Psychological, and Social Sciences*, Lawrence S. Mayer, M.B., M.S., Ph.D. and Paul R. McHugh, M.D. (2016), available at <http://www.thenewatlantis.com/publications/executive-summary-sexuality-and-gender>.

11. Attached as Exhibit 9 is a true and correct copy of United States Department of Justice and United States Department of Education, *Dear Colleague Letter on Transgender Students* (May 13, 2016), available at <https://www2.ed.gov/about/offices/list/ocr/letters/colleague-201605-title-ix-transgender.pdf>.

12. Attached as Exhibit 10 is a true and correct copy of *Dear Colleague Letter* dated February 22, 2017, by United States Department of Justice and United States Department of Education, and *Dear Colleague Letter* dated January 7, 2015, by United States Department of Justice and United States Department of Education, available at <https://www2.ed.gov/about/offices/list/ocr/letters/colleague-201702-title-ix.pdf>.

13. Attached as Exhibit 11 is a true and correct copy of a letter dated December 28, 2015, from Virgil Hollis, United States Department of Education, Office for Civil Rights, to Dr. Joseph G. Joyner, Superintendent, St. Johns County School District, re OCR Complaint #04-16-1110.

14. Attached as Exhibit 12 is a true and correct copy of a January 15, 2016, letter from Dr. Joseph G. Joyner, Superintendent, St. Johns County School District, to

Virgil Hollis, United States Department of Education, Office for Civil Rights, re Response to OCR Complaint #04-16-1110.

15. Attached as Exhibit 13 is a true and correct copy of a March 30, 2016, letter from Frank Upchurch, III, to Roger Mills, United States Department of Education, Office for Civil Rights, Region IV, re Response to OCR Complaint #04-16-1110.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 4th day of August, 2017.

  
Michael P. Spellman

**UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF NORTH CAROLINA**

JOAQUÍN CARCAÑO *et al.*,

Plaintiffs,

v.

PATRICK MCCRORY *et al.*,

Defendants

CASE NO. 1:16-CV-00236-TDS-JEP

UNITED STATES OF AMERICA,

Plaintiff,

v.

STATE OF NORTH CAROLINA *et al.*,

Defendants

CASE NO. 1:16-CV-00425-TDS-JEP

**EXPERT DECLARATION OF Paul W Hruz, M.D., Ph.D**

1. I have been retained by counsel for Defendants as an expert in connection with the above-captioned litigation. I have actual knowledge of the matters stated in this declaration. My professional background, experience, and publications are detailed in my curriculum vitae, a true and accurate copy which is attached as Exhibit A to this declaration. I received my doctor of philosophy degree from the Medical College of Wisconsin in 1993. I received my medical degree from the Medical College of Wisconsin in 1994. I am currently the Director of the Division of Pediatric Endocrinology and Diabetes at Washington University School of Medicine.

EXHIBIT 1

I served as the Director of the Pediatric Endocrinology Fellowship Program at Washington University from 2008-2016.

2. I am board certified in Pediatrics and Pediatric Endocrinology. I have been licensed to practice medicine in Missouri since 2000.

3. My professional memberships include the American Academy of Pediatrics, the Pediatric Endocrine Society, the Endocrine Society, and the American Association for Biochemistry and Molecular Biology.

4. I have extensive experience in treating infants and children with disorders of sexual development and am an active member of the multidisciplinary Disorders of Sexual Development (DSD) program at Washington University. The DSD Team at Washington University is part of the DSD-Translational Research Network, a national multi-institutional research network that investigates the genetic causes and the psychologic consequences of DSD.

5. In the nearly 20 years that I have been in clinical practice I have participated in the care of hundreds of children with disorders of sexual development including but not limited to congenital adrenal hyperplasia, 3 $\beta$ -hydroxysteroid dehydrogenase deficiency, partial and complete androgen insensitivity, 17-hydroxysteroid dehydrogenase deficiency, cloacal extrophy, aphallia, and Turner syndrome.

6. In my role as the director of the Division of Pediatric Endocrinology at Washington University, I have extensively studied the existing literature related to the incidence, potential etiology and treatment of gender dysphoria as efforts were made to develop a Transgender clinic at Saint Louis Children's Hospital. I have also participated in local and national meetings where the endocrine care of children with gender dysphoria has been discussed and debated. Pediatric patients referred to our practice for the evaluation and treatment of gender dysphoria are cared



for by an interdisciplinary team of providers that includes a psychologist and pediatric endocrinologist who have been specifically chosen for this role based upon a special interest in this rare patient population. Due to serious concerns regarding the safety, efficacy, and ethics of the current treatment paradigm, I have not directly engaged in hormonal treatment of patients with gender dysphoria.

7. My opinions as detailed in this declaration are based upon my knowledge and direct professional experience in the subject matters discussed. The materials that I have relied upon are the same types of materials that other experts in my field of clinical practice rely upon when forming opinions on the subject. A list of the sources I have relied on is attached as Exhibit B to this declaration.

8. Over my career, I have provided expert medical record review and testified at deposition in less than a dozen cases. I have never testified at trial and I have not been involved in any depositions in the past four years.

9. I am being compensated at an hourly rate for actual time devoted, at the rate of \$350 per hour. My compensation does not depend on the outcome of this litigation, the opinions I express, or the testimony I provide.

### **Basic Terminology**

10. Biological sex is a term that specifically refers to a member of a species in relation to the member's capacity to either donate (male) or receive (female) genetic material for the purpose of reproduction. This remains the standard definition that has been accepted and used by scientists, medical personnel, and society in general.

11. Gender, a term that had traditionally been reserved for grammatical purposes, is currently used to describe the psychologic and cultural characteristics of a person in relation to biological sex. Gender therefore exists in reference to societal perceptions, not biology.
12. Gender identity refers to a person's individual perception of being male or female.
13. Sexual orientation refers to a person's arousal and desire for sexual intimacy with members of the male or female sex.

**Human sexuality in relation to fundamental biology and observed variations**

14. Sex is genetically encoded at the moment of conception due to the presence of specific DNA sequences (i.e. genes) that direct the production of signals that influence the formation of the gonad to develop either into a testis or ovary. This genetic information is normally present on X and Y chromosomes. Chromosomal sex refers to the normal complement of X and Y chromosomes (i.e. normal human males have one X and one Y chromosome whereas normal human females have two X chromosomes). Genetic signals are mediated through the activation or deactivation of other genes and through programmed signaling of hormones and cellular transcription factors. The default pattern of development in the absence of external signaling is female. The development of the male appearance (phenotype) depends upon active signaling processes.
15. For members of the human species, sex is normatively aligned in a binary fashion (i.e., either male or female) in relation to biologic purpose. Medical designation of an individual as male or female is typically made at birth according to external phenotypic expression of primary sexual traits (i.e., presence of a penis for males and presence of labia and vagina for females).

16. Due to genetic and hormonal variation in the developing fetus, normative development of the external genitalia in any individual differs with respect to size and appearance while maintaining an ability to function with respect to biologic purpose (i.e. reproduction). Internal structures (e.g. gonad, uterus, vas deferens) normatively align with external genitalia.

17. Reliance upon external phenotypic expression of primary sexual traits is a highly accurate means to assign biologic sex. In over 99.9% of cases, this designation will correlate with internal sexual traits and capacity for normal biologic sexual function.

18. Due the complexity of signals that are involved in normal sexual development, it is not surprising that a small number of individuals are born with defects in this process. Defects can occur either through inherited or de novo mutations in genes that are involved in sexual determination or through environmental insults during critical states of sexual development. Persons who are born with such abnormalities are considered to have a disorder of sexual development (DSD). Most often, this is first detected as ambiguity in the appearance of the external genitalia.

19. Normal variation in external genital appearance (e.g. phallic size) does not alter the basic biologic nature of sex as a binary trait. "Intersex" conditions represent disorders of normal development, not a third sex.

20. Medical care of persons with DSDs is primarily directed toward identification of the etiology of the defect and treatment of any associated complications. Similar to other diseases, tools such as the Prader scale are used to stage the severity of the deviation from normal. In children with DSDs, characterization based upon phenotype alone does not reliably predict chromosomal sex nor does it necessarily correlate with potential for biological sexual function.

Decisions on initial sex assignment in these rare cases require detailed assessment by a team of expert medical providers.

21. Standard medical practice in the treatment of persons with DSDs has evolved with growing understanding of the physical and psychologic needs and outcomes for affected individuals. Previously, it was felt that a definitive sex assignment was necessary shortly after birth with the belief that this would allow patients with DSDs to best conform to the assigned sex. Current practice is to defer sex assignment until the etiology of the disorder is determined and, if possible, a prediction can be made on likely biologic and psychologic outcomes. When this cannot be done with confidence, a presumptive sex assignment is made. Factors used in making such decisions include chromosomal sex, phenotypic appearance of the external genitalia, and parental desires. The availability of new information can in rare circumstances lead to sex reassignment. Decisions on whether to surgically alter the external genitalia to align with sex are generally deferred until the patient is able to provide consent.

### **Gender Dysphoria in relation to Biological Sex**

22. Although gender usually aligns with biological sex, some individuals experience discordance in these distinct traits. Specifically, biologic females may identify as males and biologic males may identify as females. As gender by definition is distinct from biological sex, one's gender identity does not change a person's biological sex.

23. Individuals who experience significant distress due to discordance between gender identity and sex are considered to have "gender dysphoria". Although the prevalence of gender dysphoria has not been established by rigorous scientific analysis, estimates reported in the DSM-V are between 0.005% to 0.014% for adult males and 0.002% to 0.003% for adult females.

Thus, gender dysphoria is a rare condition. It is currently unknown whether these estimates are falsely low due to under-reporting, or if changing societal acceptance of transgenderism and the growing number of medical centers providing medical intervention for gender dysphoria affects the number of persons who identify as transgender. Recent data suggests that the number of people seeking care for gender dysphoria is increasing with some estimates as high as 4-fold.

24. Most people with gender dysphoria have normally formed and functional sexual organs. The etiology of gender dysphoria in these persons remains to be identified. Theories include prenatal hormone exposure, genetic variation, and postnatal environmental influences. Based upon the currently available but incomplete dataset, it is likely that gender dysphoria is multifactorial with differing qualitative and quantitative influences in any given individual. There is strong evidence against the theory that gender identity is determined at or before birth and is unchangeable. This comes from identical twin studies where siblings share genetic complements and prenatal environmental exposure but have differing gender identities.

25. Further evidence that gender identity is not fixed comes from well established peer reviewed literature demonstrating that the vast majority (80-95%) of children who express gender dysphoria revert to a gender identity concordant with their biological sex by late adolescence. It is not known whether individuals with gender dysphoria persistence have differing etiologies or severity of precipitating factors compared to desisting individuals.

26. The limited emerging data has suggested structural and functional differences between brains from normal and transgender individuals. These data do not establish whether these differences are innate and fixed or acquired and malleable. The remarkable neuronal plasticity of the brain is known and has been studied extensively in gender-independent contexts related to health and disease, learning and behavior.

### **Gender Ideology**

27. The modern attempt to equate gender identity with sex is not based upon sound scientific principles but rather is based upon ideology fueled by advocacy. Although worldviews among scientists and physicians, similar to society at large, differ, science is firmly grounded in physical reality not perception. The inherent link between human sexual biology and teleology is self-evident and fixed.

28. The claims of proponents of transgenderism, which include opinions such as “Gender defines who one is at his/her core” and “Gender is the only true determinant of sex” must be viewed in their proper philosophical context. There is no scientific basis for redefining sex on the basis of a person’s psychological sense of ‘gender’. It is erroneous and potentially damaging to equate these opinions as established medical fact.

29. The prevailing, constant and accurate designation of sex as a biological trait grounded in the inherent purpose of male and female anatomy and as manifested in the appearance of external genitalia at birth remains the proper scientific and medical standard. Redefinition of what is normal based upon pathologic variation is not established medical fact.

### **Potential Harm Related to Gender Dysphoria Treatments**

30. The fundamental purpose of the practice of medicine is to treat disease and alleviate suffering. An essential tenet of medical practice is to avoid doing harm in the process. Due to the frequent lack of clear and definitive evidence on how to best accomplish this goal, treatment approaches can and do frequently differ among highly knowledgeable, competent, and caring physicians.

31. Persons with gender dysphoria as delineated in the DSM-V experience significant psychological distress related to their condition with elevated risk of depression, suicide, and other morbidities. Thus, attempts to provide effective medical care to affected persons are clearly warranted.

32. Efforts to effectively treat persons with gender dysphoria require respect for the inherent dignity of those affected, sensitivity to their suffering, and maintenance of objectivity in assessing etiologies and long-term outcomes. Desistance (i.e. reversion to gender identity concordant with sex) provides the greatest lifelong benefit and is the outcome in the majority of patients and should be maintained as a desired goal. Any intervention that interferes with the likelihood of resolution is unwarranted and potentially harmful.

33. There is an urgent need for high quality controlled clinical research trials to determine ways to develop supportive dignity affirming social environments that maintain affirmation of biological reality.

34. The Endocrine Society published in 2009 clinical guidelines for the treatment of gender dysphoric patients which include temporary suppression of pubertal development of children with GnRH agonists (hormone blockers normally used for children experiencing precocious puberty) followed by hormonal treatments to induce the development of secondary sexual traits consistent with one's gender identity. This guideline was developed using the GRADE (Recommendations, Assessment, Development, and Evaluation) system for rating clinical guidelines. As directly stated in the Endocrine Society publication, "the strength of recommendations and the quality of evidence was low or very low." According to the GRADE system, low recommendations indicate "Further research is very likely to have an important

impact on our confidence in the estimate of effect and is likely to change the estimate”. Very low recommendations mean that “any estimate of effect is very uncertain”.

35. There is little or no data to support pubertal suppression as a safe or effective treatment for gender dysphoria in children or adolescents. As noted, it is well established that 80-95% of children with gender dysphoria will resolve by the end of puberty without direct intervention to affirm transgender identity. Unfavorable long-term psychiatric outcomes for transgender adults point to gender resolution following puberty as the best hope for gender dysphoric children and adolescents.

36. In addition, treatment of gender dysphoric children with hormonal treatment (pubertal suppression and cross-hormone therapy) carries significant risk. It is generally accepted, even by advocates of transgender hormone therapy, that hormonal treatment results in sterility which in many cases is irreversible. Emerging data also show that treated patients have lower bone density which may lead to increased fracture risk later in life. Other potential adverse effects include disfiguring acne, high blood pressure, weight gain, abnormal glucose tolerance, breast cancer, liver disease, thrombosis, and cardiovascular disease.

37. Since strategies for the treatment of transgendered children as summarized by the Endocrine Society guidelines are relatively new, long-term outcomes are unknown. Evidence presented as support for short term reductions in psychological distress following social transition in a “gender affirming” environment remains inconclusive. When considered apart from advocacy based agendas, multiple potential confounders are evident. The most extensive long-term data on this question comes from the Dutch experience. Although appropriate caution is warranted in extrapolating these outcomes with current treatments, adults who have undergone

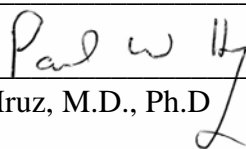


social transition with or without surgical modification of external genitalia continue to have rates of depression and suicide far above the background population.

38. With regard to public restrooms and other intimate facilities, there is no evidence to support social measures that promote or encourage gender transition as a medically necessary or effective treatment for gender dysphoria. If anything, one might expect that such social affirmation measures would interfere with known rates of gender resolution. Any activity that encourages or perpetuates transgender persistence for those who would otherwise desist can cause significant harm, including permanent sterility, to these persons. This is particularly concerning given that children are likely incapable of making informed consent to castrating treatments.

39. There remains a significant and unmet need to better understand both the biological, psychological, and environmental basis for the manifestation of discordance of gender identity in affected individuals together with rigorous controlled investigation of long-term outcomes including adverse consequences of attempted intervention. Uncontrolled social experimentation including the forced acceptance of altered norms for distinguishing persons according to biological sex is a potentially harmful and unscientific approach to dealing with this serious condition.

Pursuant to 28 U.S.C § 1746, I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Date: 08/09/2016  
Signed:   
Paul W. Hruz, M.D., Ph.D

**Exhibit B****Hruz Sources**

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44. Olson, K. R., Durwood, L., DeMeules, M., and McLaughlin, K. A. (2016) Mental Health of Transgender Children Who Are Supported in Their Identities. *Pediatrics* **137**, e20153223
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50. Schwarz, K., Fontanari, A. M., Mueller, A., Soll, B., da Silva, D. C., Salvador, J., Zucker, K. J., Schneider, M. A., and Lobato, M. I. (2016) Neural Correlates of Psychosis and Gender Dysphoria in an Adult Male. *Arch Sex Behav* **45**, 761-765
51. Sharon, N. (2016) Psychiatry's Role in Supporting Healthy Development in Gender Diverse Children. *Psychiatr Ann.* **46(6)**: 355-360.
52. Shumer, D. E., Nokoff, N. J., and Spack, N. P. (2016) Advances in the Care of Transgender Children and Adolescents. *Adv Pediatr* **63**, 79-102
53. Shumer, D. E., and Spack, N. P. (2013) Current management of gender identity disorder in childhood and adolescence: guidelines, barriers and areas of controversy. *Curr Opin Endocrinol Diabetes Obes* **20**, 69-73
54. Shumer, D. E., and Spack, N. P. (2015) Paediatrics: Transgender medicine--long-term outcomes from 'the Dutch model'. *Nat Rev Urol* **12**, 12-13

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56. Spack, N. (2005) Transgenderism. *Med Ethics (Burlingt Mass)* **12**, 1-2, 12
57. Spack, N. P. (2013) Management of transgenderism. *JAMA* **309**, 478-484
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60. Steensma, T. D., and Cohen-Kettenis, P. T. (2011) Gender transitioning before puberty? *Arch Sex Behav* **40**, 649-650
61. Steensma, T. D., and Cohen-Kettenis, P. T. (2015) More than two developmental pathways in children with gender dysphoria? *J Am Acad Child Adolesc Psychiatry* **54**, 147-148
62. Steensma, T. D., Kreukels, B. P., de Vries, A. L., and Cohen-Kettenis, P. T. (2013) Gender identity development in adolescence. *Horm Behav* **64**, 288-297
63. Steensma, T. D., McGuire, J. K., Kreukels, B. P., Beekman, A. J., and Cohen-Kettenis, P. T. (2013) Factors associated with desistence and persistence of childhood gender dysphoria: a quantitative follow-up study. *J Am Acad Child Adolesc Psychiatry* **52**, 582-590
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65. Trumbull, D., Cretella, M. A., and Grossman, M. (2015) Puberty is not a disorder. *Pediatrics* **135**, e1366
66. van de Grift, T. C., Cohen-Kettenis, P. T., Steensma, T. D., De Cuypere, G., Richter-Appelt, H., Haraldsen, I. R., Dikmans, R. E., Cerwenka, S. C., and Kreukels, B. P. (2016) Body Satisfaction and Physical Appearance in Gender Dysphoria. *Arch Sex Behav* **45**, 575-585
67. VanderLaan, D. P., Blanchard, R., Wood, H., Garzon, L. C., and Zucker, K. J. (2015) Birth weight and two possible types of maternal effects on male sexual orientation: a clinical study of children and adolescents referred to a Gender Identity Service. *Dev Psychobiol* **57**, 25-34
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76. Zucker, K. J. (1999) Gender identity disorder in the DSM-IV. *J Sex Marital Ther* **25**, 5-9
77. Zucker, K. J. (2002) Evaluation of sex- and gender-assignment decisions in patients with physical intersex conditions: a methodological and statistical note. *J Sex Marital Ther* **28**, 269-274

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83. Zucker, K. J. (2010) Reports from the DSM-V Work Group on sexual and gender identity disorders. *Arch Sex Behav* **39**, 217-220
84. Zucker, K. J., Beaulieu, N., Bradley, S. J., Grimshaw, G. M., and Wilcox, A. (2001) Handedness in boys with gender identity disorder. *J Child Psychol Psychiatry* **42**, 767-776
85. Zucker, K. J., Bradley, S. J., Ben-Dat, D. N., Ho, C., Johnson, L., and Owen, A. (2003) Psychopathology in the parents of boys with gender identity disorder. *J Am Acad Child Adolesc Psychiatry* **42**, 2-4
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87. Zucker, K. J., Bradley, S. J., and Hughes, H. E. (1987) Gender dysphoria in a child with true hermaphroditism. *Can J Psychiatry* **32**, 602-609
88. Zucker, K. J., Bradley, S. J., Kuksis, M., Pecore, K., Birkenfeld-Adams, A., Doering, R. W., Mitchell, J. N., and Wild, J. (1999) Gender constancy judgments in children with gender identity disorder: evidence for a developmental lag. *Arch Sex Behav* **28**, 475-502
89. Zucker, K. J., Bradley, S. J., Owen-Anderson, A., Kibblewhite, S. J., and Cantor, J. M. (2008) Is gender identity disorder in adolescents coming out of the closet? *J Sex Marital Ther* **34**, 287-290
90. Zucker, K. J., Bradley, S. J., Owen-Anderson, A., Kibblewhite, S. J., Wood, H., Singh, D., and Choi, K. (2012) Demographics, behavior problems, and psychosexual characteristics of adolescents with gender identity disorder or transvestic fetishism. *J Sex Marital Ther* **38**, 151-189
91. Zucker, K. J., Bradley, S. J., and Sanikhani, M. (1997) Sex differences in referral rates of children with gender identity disorder: some hypotheses. *J Abnorm Child Psychol* **25**, 217-227
92. Zucker, K. J., Bradley, S. J., Sullivan, C. B., Kuksis, M., Birkenfeld-Adams, A., and Mitchell, J. N. (1993) A gender identity interview for children. *J Pers Assess* **61**, 443-456
93. Zucker, K. J., Finegan, J. K., Doering, R. W., and Bradley, S. J. (1984) Two subgroups of gender-problem children. *Arch Sex Behav* **13**, 27-39
94. Zucker, K. J., Green, R., Coates, S., Zuger, B., Cohen-Kettenis, P. T., Zecca, G. M., Lertora, V., Money, J., Hahn-Burke, S., Bradley, S. J., and Blanchard, R. (1997) Sibling sex ratio of boys with gender identity disorder. *J Child Psychol Psychiatry* **38**, 543-551
95. Zucker, K. J., Green, R., Garofano, C., Bradley, S. J., Williams, K., Rebach, H. M., and Sullivan, C. B. (1994) Prenatal gender preference of mothers of feminine and masculine boys: relation to sibling sex composition and birth order. *J Abnorm Child Psychol* **22**, 1-13
96. Zucker, K. J., Lawrence, A. A., and Kreukels, B. P. (2016) Gender Dysphoria in Adults. *Annu Rev Clin Psychol* **12**, 217-247
97. Zucker, K. J., and Wood, H. (2011) Assessment of gender variance in children. *Child Adolesc Psychiatr Clin N Am* **20**, 665-680
98. Zucker, K. J., Wood, H., Wasserman, L., VanderLaan, D. P., and Aitken, M. (2016) Increasing Referrals for Gender Dysphoria. *J Adolesc Health* **58**, 693-694

## Curriculum Vitae

**Paul W. Hruz, MD, PhD**

Date: August 9, 2016

### Personal Information

Date of birth: November 22, 1965

Place of birth: WI

Citizenship: USA

### Address and Telephone Numbers

University: Washington University School of Medicine  
Department of Pediatrics  
Division of Endocrinology and Diabetes  
660 South Euclid Avenue, Campus Box 8208  
St. Louis, MO 63110  
Phone: 314-286-2797  
Fax: 314-286-2892  
email: hruz\_p@kids.wustl.edu

### Present Position

Associate Professor of Cell Biology and Physiology  
Associate Professor of Pediatrics  
Division Director, Pediatric Endocrinology and Diabetes

### Education and Training

1987 B.S., Chemistry, Marquette University, Milwaukee, WI  
1993 Ph.D., Biology and Physiology, Medical College of Wisconsin, Milwaukee, WI  
1994 M.D., Medicine, Medical College of Wisconsin, Milwaukee, WI  
1994 - 1997 Pediatric Residency, University of Washington - Pediatric, Seattle, Washington  
1997 - 2000 Pediatric Endocrinology Fellowship, Washington University - Pediatric Endocrinology, Saint Louis, MO

### Academic Positions and Employment

1996 - 1997 Locum Tenens Physician, Group Health of Puget Sound Eastside Hospital, Group Health of Puget Sound Eastside Hospital, Seattle, WA  
2000 - 2003 Instructor of Pediatrics, Washington University, St. Louis, MO  
2003 - 2011 Assistant Professor of Pediatrics, Washington University, St. Louis, MO

- 2004 - 2011 Assistant Professor of Cell Biology and Physiology, Washington University, St. Louis, MO
- 2011 - Pres Associate Professor of Pediatrics, Washington University, St. Louis, MO
- 2011 - Pres Associate Professor of Cell Biology and Physiology, Washington University, St. Louis, MO
- 2012 - Pres Division Director, Pediatric Endocrinology and Diabetes, Washington University, St. Louis, MO

## Appointments and Committees

### NIH Study Sections:

- 2005 NIH- NIDDK Special Emphasis Panel ZDK1 GRB-6 (Non-Standing Member)
- 2009 NIH- ACE Competitive Revisions ZRG1 AARR-H (95) S (Non-Standing Member)
- 2009 NIH- AIDS and AIDS Related Research IRG (Standing Member)
- 2011 NIH- Pediatric Endocrinologist K12 ZDK1 GRB-C (Non-Standing Member)
- 2014 NIH- Special Emphasis Panel ZRG1 BBBPY 58 (Non-Standing Member)
- 2014 NIH- AIDS and AIDS Related Research IRG (Standing Member)
- 2015 NIH- Cardiovascular and Respiratory Sciences Special Emphasis Panel ZDK1 GRB-J (02) (Non-Standing Member)
- 2015 NIH- NIDDK Special Emphasis Panel ZRG1 CVRS-Q (80) (Non-Standing Member)

### University Affiliations:

- 2008 - Pres Director, Pediatric Endocrinology & Diabetes Fellowship Program
- 2010 - Pres Pediatric Computing Facility Advisory Committee
- 2012 - Pres Disorders of Sexual Development Interdisciplinary Care Program
- 2012 - Pres Director, Division of Pediatric Endocrinology & Diabetes
- 2014 - Pres Research Consultant, ICTS Research Forum - Child Health
- 2014 - Pres Director, Pediatric Diabetes Research Consortium

### Hospital Affiliations:

- 2000 - Pres Attending Physician, St. Louis Children's Hospital

### Thesis Committees (\* Chair)

- | <u>Thesis Committees (* Chair)</u> | <u>Advisor</u>        |
|------------------------------------|-----------------------|
| 2008 - 2011 Kelly Diggs-Andrews    | Simon Fisher          |
| 2008 - 2010 Irwin Puentes          | Simon Fisher          |
| 2008 - 2010 Tony Frovola           | Kelle Moley           |
| 2009 - 2010 Lauren Flessner        | Kelle Moley           |
| 2010 - 2012 Katie Boehle           | Kelle Moley           |
| 2010 - 2013 Candace Reno*          | Simon Fisher          |
| 2011 -Pres Thomas Kraft            | Paul Hruz             |
| 2013 - 2015 Chi Lun Pui            | Audrey Odom           |
| 2013 -Pres Leah Imlay              | Audrey Odom           |
| 2014 -Pres Anne Robinson           | Katie Henzler-Wildman |



2015 -Pres Allyson Mayer Brian DeBosch

Scholarship Oversight Committees

2013 -Pres Brittany Knipsein (Advisor: David Rudnick)

**Licensure and Certifications**

1997 - 2016 Board Certified in General Pediatrics  
2000 - 2014 MO State License #2000155004  
2001 - Pres Board Certified in Pediatric Endocrinology & Metabolism

**Honors and Awards**

1987 National Institute of Chemists Research and Recognition Award  
1987 Phi Beta Kappa  
1987 Phi Lambda Upsilon (Honorary Chemical Society)  
1988 American Heart Association Predoctoral Fellowship Award  
1994 Alpha Omega Alpha  
1994 Armond J. Quick Award for Excellence in Biochemistry  
1994 NIDDK/Diabetes Branch Most Outstanding Resident  
1998 Pfizer Postdoctoral Fellowship Award  
2002 Scholar, Child Health Research Center of Excellence in Developmental  
Biology at Washington University  
2013 Julio V Santiago, M.D. Scholar in Pediatrics

**Editorial Responsibilities**

Editorial Boards:

2014 - Pres Endocrinology and Metabolism Clinics of North America

Ad Hoc Reviewer:

AIDS  
AIDS Research and Human Retroviruses  
American Journal of Pathology  
American Journal of Physiology  
British Journal of Pharmacology  
Circulation Research  
Clinical Pharmacology & Therapeutics  
Comparative Biochemistry and Physiology  
Diabetes  
Experimental Biology and Medicine  
Future Virology  
Journal of Antimicrobial Chemotherapy  
Journal of Biological Chemistry  
Journal of Clinical Endocrinology & Metabolism  
Journal of Molecular and Cellular Cardiology  
Obesity Research

**Professional Societies and Organizations**

1992 - 2004 American Medical Association  
 1994 - 2005 American Academy of Pediatrics  
 1995 - 2014 American Association for the Advancement of Science  
 1998 - Pres American Diabetes Association  
 1998 - Pres Endocrine Society  
 1999 - Pres Pediatric Endocrine Society  
 2004 - Pres American Society for Biochemistry and Molecular Biology  
 2004 - Pres Society for Pediatric Research  
 2004 - 2007 American Chemical Society  
 2005 - Pres Full Fellow of the American Academy of Pediatrics  
 2013 - Pres International Society for Pediatric and Adolescent Diabetes

**Major Invited Professorships and Lectures**

2002 St. Louis Children's Hospital, Pediatric Grand Rounds, St. Louis, MO  
 2004 National Disease Research Interchange, Human Islet Cell Research  
 Conference, Philadelphia, PA  
 2004 NIDA-NIH Sponsored National Meeting on Hormones, Drug Abuse and  
 Infections, Bethesda, MD  
 2005 The Collaborative Institute of Virology, Complications Committee Meeting,  
 Boston, MA  
 2005 University of Indiana, Endocrine Grand Rounds, Indianapolis, IN  
 2006 Metabolic Syndrome Advisory Board Meeting, Bristol-Meyers Squibb,  
 Pennington, NJ  
 2007 American Heart Association and American Academy of HIV Medicine  
 State of the Science Conference: Initiative to Decrease Cardiovascular  
 Risk and Increase Quality of Care for Patients Living with HIV/AIDS,  
 Chicago, IL  
 2007 Medical College of Wisconsin, MSTP Annual Visiting Alumnus Lecture,  
 Milwaukee, WI  
 2007 St Louis Children's Hospital, Pediatric Grand Rounds, St Louis, MO  
 2007 University of Arizona, Minority Access to Research Careers Seminar,  
 Tucson AZ  
 2008 Boston University, Division of Endocrinology, Diabetes and Nutrition,  
 Boston, MA  
 2009 St Louis Children's Hospital, Pediatric Grand Rounds, St Louis, MO  
 2010 American Diabetes Association Scientific Sessions, Symposium Lecture  
 Orlando, FL  
 2010 University of Missouri Kansas City, School of Biological Sciences, Kansas  
 City, MO  
 2011 Life Cycle Management Advisory Board Meeting, Bristol-Myers Squibb,  
 Chicago, IL  
 2013 St Louis Children's Hospital, Pediatric Grand Rounds, St Louis MO  
 2013 St Louis Children's Hospital CPU Lecture, St Louis MO

2014 Pediatric Academic Societies Meeting, Vancouver, Canada, May 5, 2014  
2014 American Diabetes Association 74th Scientific Sessions, San Francisco, CA, June 13, 2014

### **Consulting Relationships and Board Memberships**

1996 - 2012 Consultant, Bristol Myers Squibb  
1997 - 2012 Consultant, Gilead Sciences

### **Research Support**

#### Governmental Support

R01 (Hruz) 9/20/2009 - 5/31/2014 (NCE)

NIH

Direct Effects of Antiretroviral Therapy on Cardiac Energy Homeostasis

The goal of this project is to characterize the influence of antiretroviral therapies on myocardial energy homeostasis and to elucidate how these changes in substrate delivery adversely affect cardiac function in the stressed heart.

Role: Principal Investigator

R01 (Hruz) 4/1/2007 - 1/31/2012 (NCE)

NIH

Mechanisms for Altered Glucose Homeostasis During HAART

The goal of this project is to identify the cellular targets of HIV protease inhibitors that lead to peripheral insulin resistance, impaired beta-cell function, and alterations in hepatic glucose production and to elucidate the molecular mechanisms of these effects.

Role: Principal Investigator

#### Non-Governmental Support

Research Program (Hruz) 6/1/2009 - 5/31/2012 (NCE)

MOD

Regulation of GLUT4 Intrinsic Activity

The major goals of this project are to investigate the ability of the GLUT4 tethering protein TUG and an UBL-domain containing N-terminal fragment of this protein to alter the intrinsic activity of the insulin responsive facilitative glucose transporter, to determine whether protein ubiquitination influences this association, and to characterize the role of the GLUT4 binding site on the modulation of glucose transport.

Role: Principal Investigator

(Hruz) 3/9/2010 - 6/8/2011 (NCE)

Bristol-Myers Squibb

Protective Effect of Saxagliptin on a Progressive Deterioration of Cardiovascular Function

Role: Principal Investigator

(Hruz)

Gilead Pharma

Novel HIV Protease Inhibitors and GLUT4

Role: Principal Investigator

II (Hruz)

2/1/2008 - 1/31/2011 (NCE)

CDI

Insulin Resistance and Myocardial Glucose Metabolism in Pediatric Heart Failure

Role: Co-Principal Investigator

Completed Support

R01 Student Supp (Hruz)

6/10/2009 - 8/31/2011

NIH

Mechanisms for Altered Glucose Homeostasis During HAART

II (Hruz)

2/1/2012 - 1/31/2015

CDI

Solution-State NMR Structure and Dynamics of Facilitative Glucose Transport Proteins

**Past Trainees**

2002 - 2002 Nishant Raj- Undergraduate Student (Other)

Study area: Research

2003 - 2004 Johann Hertel (Medical Student)

Study area: Research

Present position: Assistant Professor, University of North Carolina, Chapel Hill, NC

2003 John Paul Shen (Medical Student)

Study area: Research

2004 - 2005 Carl Cassel- High School Student (Other)

Study area: Research

2004 - 2004 Christopher Hawkins- Undergraduate Student (Other)

Study area: Research

2004 - 2004 Kaiming Wu- High School Student (Other)

Study area: Research

2005 Helena Johnson (Graduate Student)

2005 Jeremy Etkorn (Medical Student)

Study area: Research

Present position: Assistant Professor, University of Pennsylvania

2006 Ramon Jin (Graduate Student)

Study area: Research

2006 Taekyung Kim (Graduate Student)

Study area: Research

2007 - 2008 Kai-Chien Yang (Graduate Student)

Study area: Research

Present position: Postdoctoral Research Associate, University of Chicago

2007 Paul Buske (Graduate Student)

Study area: Research

Present position: Postdoctoral Fellow, UCSF, San Francisco CA

2007 Randy Colvin (Medical Student)  
Study area: Research

2007 - 2007 Jan Freiss- Undergraduate Student (Other)  
Study area: Research

2008 - 2011 Arpita Vyas, MD (Clinical Fellow)  
Study area: Research  
Present position: Assistant Professor, Michigan State University, Lansing MI

2008 - 2009 Candace Reno (Graduate Student)  
Study area: Research  
Present position: Research Associate, University of Utah

2008 Temitope Aiyejorun (Grad Student)  
Study area: Research

2008 - 2012 Dennis Woo- Undergraduate Student (Other)  
Study area: Research  
Present position: MSTP Student, USC, Los Angeles CA

2009 Stephanie Scherer (Grad Student)  
Study area: Research

2009 Anne-Sophie Stolle- Undergraduate Student (Other)  
Study area: Research

2009 - 2009 Matthew Hruz- High School Student (Other)  
Study area: Research  
Present position: Computer Programmer, Consumer Affairs, Tulsa OK

2010 Constance Haufe- Undergraduate Student (Other)  
Study area: Research

2010 - 2011 Corinna Wilde- Undergraduate Student (Other)  
Study area: Researcher

2010 - 2010 Samuel Lite- High School Student (Other)  
Study area: Research

2011 - 2011 Amanda Koenig- High School Student (Other)  
Study area: Research

2011 - 2012 Lisa Becker- Undergraduate Student (Other)

2011 - 2011 Melissa Al-Jaoude- High School Students (Other)

2002 - 2010 Joseph Koster, PhD (Postdoc Fellow)  
Study area: Research

2005 Dominic Doran, DSc (Postdoctoral Fellow)  
Study area: HIV Protease Inhibitor Effects on Exercise Tolerance  
Present position: Faculty of Science, Liverpool John Moores Institute

2014 - 2014 David Hannibal (Clinical Research Trainee)

2010 - 2014 Lauren Flessner, PhD (Postdoctoral Fellow)  
Present position: Instructor, Syracuse University

2011 - 2016 Thomas Kraft (Graduate Student)  
Study Area: Glucose transporter structure/function  
Present position: Postdoctoral Fellow, Roche, Penzberg, Germany

## Clinical Responsibilities

General Pediatrician, General Pediatric Ward Attending: 2-4 weeks per year, St. Louis Children's Hospital

Pediatric Endocrinologist, Endocrinology Night Telephone Consult Service: Average of 2-6 weeks/per year, St. Louis Children's Hospital

Pediatric Endocrinologist, Inpatient Endocrinology Consult Service: 4-6 weeks per year, St. Louis Children's Hospital

Pediatric Endocrinologist, Outpatient Endocrinology Clinic: Approximately 50 patient visits per month, St. Louis Children's Hospital

## Teaching Responsibilities

Facilitator, Biology 5011- Ethics and Research Science, 6 hours/year

Facilitator, Cell Biology Graduate Student Journal Club, 4 hour/year

Facilitator, Discussion: Pituitary, Growth & Gonadal Cases, 2 hours/year

Facilitator, Medical Student Endocrinology and Metabolism Course, Small group

Lecturer, Cell Signaling Course, Diabetes module, 3 hours/year

Lecturer, Markey Course-Diabetes Module

Lecturer, Medical Student Growth Lecture (Women and Children's Health Rotation): Variable

Lecturer, Metabolism Clinical Rounds/Research Seminar: Presentations twice yearly

Lecturer, Pediatric Endocrinology Journal Club: Presentations yearly

## Publications

1. Hruz, P. W., Narasimhan, C., Miziorko, H. M. (1992). 3-Hydroxy-3-methylglutaryl coenzyme A lyase: affinity labeling of the *Pseudomonas mevalonii* enzyme and assignment of cysteine-237 to the active site. *Biochemistry*, 31 (29), 6842-7 PubMed: [1637819](#).
2. Hruz, P. W., Miziorko, H. M. (1992). Avian 3-hydroxy-3-methylglutaryl-CoA lyase: sensitivity of enzyme activity to thiol/disulfide exchange and identification of proximal reactive cysteines. *Protein Sci*, 1 (9), 1144-53. PMCID: [PMC2142181](#) PubMed: [1304393](#).
3. Mitchell, G. A., Robert, M. F., Hruz, P. W., Wang, S., Fontaine, G., Behnke, C. E., Mende-Mueller, L. M., Schappert, K., Lee, C., Gibson, K. M., Miziorko, H. M. (1993). 3-Hydroxy-3-methylglutaryl coenzyme A lyase (HL). Cloning of human and chicken liver HL cDNAs and characterization of a mutation causing human HL deficiency. *J Biol Chem*, 268 (6), 4376-81 PubMed: [8440722](#).
4. Hruz, P. W., Anderson, V. E., Miziorko, H. M. (1993). 3-Hydroxy-3-methylglutaryldithio-CoA: utility of an alternative substrate in elucidation of a role for HMG-CoA lyase's cation activator. *Biochim Biophys Acta*, 1162 (1-2), 149-54 PubMed: [8095409](#).
5. Roberts, J. R., Narasimhan, C., Hruz, P. W., Mitchell, G. A., Miziorko, H. M. (1994). 3-Hydroxy-3-methylglutaryl-CoA lyase: expression and isolation of the recombinant

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### Invited Publications

1. Hruz, P. W., Mueckler, M. M. (2001). Structural analysis of the GLUT1 facilitative glucose transporter (review). *Mol Membr Biol*, 18 (3), 183-93 PubMed: [11681785](#).
2. Hruz, P. W., Murata, H., Mueckler, M. (2001). Adverse metabolic consequences of HIV protease inhibitor therapy: the search for a central mechanism. *Am J Physiol Endocrinol Metab*, 280 (4), E549-53 PubMed: [11254460](#).
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6. Hruz, P. W. (2008). HIV protease inhibitors and insulin resistance: lessons from in-vitro, rodent and healthy human volunteer models. *Curr Opin HIV AIDS*, 3 (6), 660-5. PMCID: [PMC2680222](#) PubMed: [19373039](#).
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  9. Hruz, P.W. (2014). HIV and endocrine disorders. *Endocrinol Metab Clin North Am*, 43 (3), xvii–xviii PubMed: [25169571](#).

#### **Book Chapters (most recent editions)**

1. Henderson KE, Baranski TJ, Bickel PE, Clutter PE, Clutter WE, McGill JB "Endocrine Disorders in HIV/AIDS ." *The Washington Manual Endocrinology Subspecialty Consult*. Philadelphia, PA: Lippincott Williams and Wilkins, 2008. 321-328.

**UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF NORTH CAROLINA**

JOAQUÍN CARCAÑO *et al.*,

Plaintiffs,

v.

PATRICK MCCRORY *et al.*,

Defendants

CASE NO. 1:16-CV-00236-TDS-JEP

UNITED STATES OF AMERICA,

Plaintiff,

v.

STATE OF NORTH CAROLINA *et al.*,

Defendants

CASE NO. 1:16-CV-00425-TDS-JEP

**DECLARATION OF QUENTIN L. VAN METER, MD**

1. I have been retained by counsel for Defendants as an expert in connection with the above-captioned litigation. I have actual knowledge of the matters stated in this declaration. My professional background, experience, and publications are detailed in my curriculum vitae, a true and accurate copy which is attached as Exhibit A to this declaration.

2. I received my B.A. in Science at the College of William and Mary, and my M.D. from the Medical College of Virginia, Virginia Commonwealth University.

EXHIBIT 2

3. I am currently a pediatric endocrinologist in private practice in Atlanta Georgia. I am the President of Van Meter Pediatric Endocrinology, P.C. I am on the clinical faculties of Emory University School of Medicine and Morehouse College of Medicine, in the role of adjunct Associate Professor of Pediatrics.

4. I am board certified in Pediatrics and Pediatric Endocrinology. I have been licensed to practice medicine in Georgia since 1991. I have been previously licensed to practice medicine in California, Louisiana, and Maryland.

5. I did my Pediatric Endocrine fellowship at Johns Hopkins Hospital from 1978-1980. The faculty present at that time had carried on the tradition of excellence established by Lawson Wilkins, M.D. Because of the reputation of the endocrine program as a center for exceptional care for children with disorders of sexual differentiation, I had well-above average exposure to such patients. As a Pediatric Fellow, I was also exposed to adults with Gender Identity Disorder, then called Trans-Sexuality, and received training from John Money, Ph.D., in his Psycho-hormonal Division.

6. I have maintained a continued interest in gender discordance since my fellowship years and have read extensively the literature in scientific peer-reviewed journals and have attended national and international pediatric endocrine conferences where this subject is presented and discussed. I am also familiar with the wide array of commentary on the subject.

7. My professional memberships include The Pediatric Endocrine Society, the Endocrine Society, the American Association of Clinical Endocrinologists where I hold a position on the Pediatric Scientific Committee, the American Diabetes Association, and I am a fellow of the American College of Pediatricians, currently serving on the Board of Directors as Vice

President. I am on the Board of Directors of Camp Kudzu, a non-profit organization which provides diabetes camp experience in Georgia.

8. My opinions expressed in this report are based upon my education, training, and experience in the subject matters discussed. The materials that I have relied upon are the same types of materials that other experts in my field rely upon when forming opinions. Specific sources upon which I rely in this declaration are footnoted.

9. Over my career, I have served as an expert witness in medical malpractice cases for both plaintiff and defense. I have testified at Georgia State Legislative Committee hearings. In the past four years, I have testified by deposition in *Harlen Schneider v. J. Enrique Lujan, M.D. et al.*, in the circuit court of the first judicial circuit of Okaloosa County, FL, Civil Division, on 7 Feb 2014; and in the case of plaintiff Kimora Gilmer, represented by attorneys at the Birmingham, AL, firm of Pittman Dutton on 22 May 2014.

10. My publications include a textbook chapter, case studies, and articles generated by clinical research studies. I serve on the speaker's bureau of major pharmaceutical companies.

11. I am being compensated at an hourly rate for actual time devoted, at the rate of \$250 per hour. My compensation does not depend on the outcome of this litigation, the opinions I express, or the testimony I provide.

### **Sexual Differentiation in the Fetus**

12. From the moment of conception, a fetus is determined to be either a male (XY), female (XX), or in rare cases, to have a combination of sex-determining chromosomes, many of which are not compatible with life, and some of which are the cause of identifiable clinical syndromes. The presence of a Y chromosome in the developing fetus directs the developing gonadal tissue to develop as a testicle. The absence of a functional Y chromosome allows the gonadal tissue to

develop as an ovary. Under the influence of the mother's placental hormones, the testicle will produce testosterone which directs the genital tissue to form a penis and a scrotum.

Simultaneously, the testicle produces anti-Müllerian Hormone (AMH) which regresses development of the tissue that would otherwise develop into the uterus, fallopian tubes, and upper third of the vagina.

13. This combination of actions in early fetal development is responsible for what we subsequently see on fetal sonograms, and what we observe at birth as male or female genitalia. It is only when the genital structures are ambiguous in appearance that sex assignment is withheld until a thorough expert team evaluation has occurred.

14. For reasons most often occurring as random events, there are malfunctions of the normal differentiation. These aberrations of normal development are responsible for what we classify as Disorders of Sexual Differentiation (DSD) and they represent a very small fraction of the human population. The incidence of such circumstances occurs in 1:4500 to 1:5500 births.<sup>1</sup>

15. Sex is binary, male or female, and is determined by chromosomal complement and corresponding reproductive role. The exceedingly rare DSDs are all medically identifiable deviations from the human binary sexual binary norm. The 2006 consensus statement of the Intersex Society of North America and the 2015 revision of the Statement does not endorse DSD as a third sex.<sup>2</sup>

16. DSD outcomes range from appearance of female external genitalia in an XY male (complete androgen insensitivity syndrome) to appearance of male external genitalia in an XX female (severe congenital adrenal hyperplasia). As one would expect, there are variations of the

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<sup>1</sup> Lee PA et al, Global Disorders of Sex Development Update since 2006: Perceptions, Approach and Care, 2016 *Horm Res Paediatr*.

<sup>2</sup> Lee PA et al, Consensus Statement on Management of Intersex Disorders, *Pediatrics* 2006; 118 e488-e500.

degree of hormonally driven changes that create ambiguous genital development that prevent assigning of a specific classification as either male or female at birth.

17. DSD patients are not “transgender”; they have an objective, physical, medically verifiable, physiologic condition. Transgender people generally do not have intersex conditions or any other verifiable physical anomaly. People who identify as “feeling like the opposite sex” or “somewhere in between” do not comprise a third sex. They remain biological men or biological women.

18. In some DSDs there exist more than one set of chromosomes. When there is a divergence of the appearance of the external genitalia from the chromosomally-determined sex due to the presence of both an ovarian and testicular cell lines in a patient simultaneously, the patient is classified as having ovo-testicular DSD (formerly termed a true hermaphrodite). When there is a disruption in the development of genital structures but there is solely testicular tissue present in the chromosomal male or solely ovarian tissue in the chromosomal female, the term 46 XY DSD or 46 XX DSD is used instead respectively (formerly termed male pseudohermaphrodite or female pseudohermaphrodite).

19. The decision to assign a sex of rearing is complex and is specific to the diagnosis. Patients with complete androgen insensitivity (CAIS) are XY DSD but are never reared as a male. Because testosterone never influences development, they become happy, functional female adults with infertility. Females with severe congenital adrenal hyperplasia (CAH) are XX DSD but are not reared as males despite the male appearance of the genitalia at birth. Although these girls may show a tendency for male play behaviors as children, they generally assume a female sexual identity.

20. Therapeutic interventions in the DSD individuals from infancy onward are aimed at what function can be expected from their disordered sexual anatomy in terms of function and fertility. Most often, the chromosomal sex aligns with the sex of rearing.

### **Gender Identity**

21. “Gender” is a term that refers to the psychological and cultural characteristics associated with biological sex. It is a psychological concept and sociological term, not a biological one. The term gender possessed solely a linguistic meaning prior to the 1950s. This changed when sexologists of the 1950s and 1960s manipulated the term to conceptualize cross-dressing and transsexualism in their psychological practice.

22. “Gender identity” is a term coined by my former endocrine faculty member John Money in the 1970s and has come to refer to an individual’s mental and emotional sense of being male or female. The norm is for individuals to have a gender identity that aligns with one's biological sex.

23. Gender discordance (formerly Gender Identity Disorder) is used to describe a psychological condition in which a person experiences marked incongruence between his experienced gender and the gender associated with his biological sex. He will often express the belief that he is the opposite sex.

24. Gender discordance occurs in 0.001% of biological females and in 0.0033% of biological males.<sup>3</sup> Exact numbers are hard to document since reporting is often anecdotal. Gender discordance is not considered a normal developmental variation.

25. “Gender Dysphoria” is a diagnostic term to describe the emotional distress caused by gender incongruity.<sup>4</sup>

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<sup>3</sup> Seaborg E, About Face, Endocrine News 2014 (May) 16-19.

<sup>4</sup> American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 5th ed; 2013:451-459.



26. John Money played a prominent role in the early development of gender theory and transgenderism. He understood gender to be “the social performance indicative of an internal sexed identity.”<sup>5</sup> He joined the Johns Hopkins faculty in 1951 specifically to have access to children diagnosed with DSD, hoping to prove his theory that gender was arbitrary and fluid.

27. Money experimented with DSD infants by assigning them to the opposite biological sex through surgical revision, counseling, and hormonal manipulation during puberty. His mode of operation was to have a theory and then experiment with patients to see how his theory worked. This kind of endeavor does not anticipate or prevent adverse outcomes and is the antithesis of ethical science. Money never submitted his research proposals for review; today, Institutional Review Boards (IRBs) serve to rigorously review proposed clinical research protocols to prevent all potential and real harm to patients.

28. Because of his experience with infants, Money initially garnered support from endocrine colleagues and surgical colleagues, and Johns Hopkins became a renowned center for care of patients with DSD in the 1970s, garnering referrals from around the world. Follow-up studies on these infants later showed, however, that altering their natal sexual identity via social intervention could lead to severe psychological harm. Clinical case reports of children with DSD have revealed that gender identity is indeed biologically influenced though not immune to environmental input.<sup>6</sup>

29. Meanwhile Money had expanded into the field of adult patients with persistent gender identity disorder. This very small group of patients chose voluntarily, as adults, to enter a very precise protocol which began with living socially as the opposite sex for a year, eventually receiving hormonal therapy to change their physical appearance to some extent. The final step

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<sup>5</sup> Jeffeys, Sheila. *Gender Hurts: A feminist analysis of the politics of transgenderness*. Routledge. 2014 (p. 27).

<sup>6</sup> Whitehead, N. *My Genes Made Me Do It*. Chapter 5.

was surgical revision of the body structures that would otherwise be at odds with their desired gender. This small group of patients was followed for a number of years past their final surgical procedures and required continuous counseling. These patients expressed some degree of subjective satisfaction, but showed no objective improvement in overall wellbeing.<sup>7</sup>

30. The legacy of John Money fell into disrepute and the transsexual treatment program at Johns Hopkin was closed in the 1980s based on the lack of evidence that this protocol produced an effective cure.

### **Etiology of Gender Disorders**

31. Transgender affirming professionals claim transgender individuals have a "feminized brain" trapped in a male body at birth and vice versa based upon various brain studies.

Diffusion-weighted MRI scans have demonstrated that the pubertal testosterone surge in boys increases white matter volume. A study by Rametti and colleagues found that the white matter microstructure of the brains of female-to-male (FtM) transsexual adults, who had not begun testosterone treatment, more closely resembled that of men than that of women.<sup>8</sup> Other diffusion-weighted MRI studies have concluded that the white matter microstructure in both FtM and male-to-female (MtF) transsexuals falls halfway between that of genetic females and males.<sup>9</sup> These studies, however, are of limited clinical significance due to the small number of subjects and failure to account for neuroplasticity.

32. Neuroplasticity is the well-established phenomenon in which long-term behavior alters brain microstructure. For example, the MRI scans of experienced cab drivers in London are distinctly different from those of non-cab drivers, and the changes noted are dependent on the

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<sup>7</sup> Meyer J.K. and Reter D. Sex Reassignment Follow-up . Arch. Gen. Psychiatry 36:1010-1015, 1979.

<sup>8</sup> Rametti G, Carrillo B, Gomez-Gil E, et al. White matter microstructure in female to male transsexuals before cross-sex hormonal treatment. A diffusion tensor imaging study. *J Psychiatr Res* 2011;45:199-204.

<sup>9</sup> Kranz GS, Hahn A, Kaufmann U, et al. White matter microstructure in transsexuals and controls investigated by diffusion tensor imaging. *J Neurosci* 2014;34(46):15466-15475.

years of experience.<sup>10</sup> There is no evidence that people are born with brain microstructures that are forever unalterable, but there is significant evidence that experience changes brain microstructure.<sup>11, 12</sup> Therefore, any transgender brain differences would more likely be the result of transgender behavior than its cause.

33. Furthermore, infants' brains are imprinted prenatally by their own endogenous sex hormones, which are secreted from their gonads beginning at approximately eight weeks' gestation.<sup>13, 14, 15</sup> There are no published studies documenting MRI-verified differences in the brains of gender-disordered children or adolescents. The DSD guidelines also specifically state that current MRI technology cannot be used to identify those patients who should be raised as males or raised as females.<sup>16</sup>

34. Behavior geneticists have known for decades that while genes and hormones influence behavior, they do not hard-wire a person to think, feel, or behave in a particular way. The science of epigenetics has established that genes are not analogous to rigid "blueprints" for behavior. Rather, humans "develop traits through the dynamic process of gene-environment interaction. ... [genes alone] don't determine who we are."<sup>17</sup>

35. Regarding transgenderism, twin studies of adults prove definitively that prenatal genetic and hormone influence is minimal. The largest twin study of transgender adults found that only

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<sup>10</sup> Maguire EA et al, Navigation-related structural change in the hippocampi of taxi drivers, *PNAS* 2000;97:4398-4403.

<sup>11</sup> Gu J, Kanai R. What contributes to individual differences in brain structure? *Front Hum Neurosci* 2014;8:262.

<sup>12</sup> Sale A, Berardi N, Maffei L, Environment and Brain Plasticity: Towards an Endogenous Pharmacotherapy, *Physiol Rev* 2014; 94: 189–234.

<sup>13</sup> Reyes FI, Winter JS, Faiman C. Studies on human sexual development fetal gonadal and adrenal sex steroids. *J Clin Endocrinol Metab* 1973; 37(1):74-78.

<sup>14</sup> Lombardo M. Fetal testosterone influences sexually dimorphic gray matter in the human brain. *J Neurosci* 2012; 32:674-680.

<sup>15</sup> Campano A. [ed]. Geneva Foundation for Medical Education and Research. *Human Sexual Differentiation*; 2016. Available at: [www.gfmer.ch/Books/Reproductive\\_health/Human\\_sexual\\_differentiation.html](http://www.gfmer.ch/Books/Reproductive_health/Human_sexual_differentiation.html). Accessed May 11, 2016.

<sup>16</sup> Lee PA et al, Consensus Statement on Management of Intersex Disorders, *Pediatrics* 2006; 118 e488-e500.

<sup>17</sup> Shenk, D. *The Genius in All of Us: Why everything you've been told about genetics, talent, and IQ is wrong*. (2010) New York, NY: Doubleday; p. 18.

20 percent of identical twins were both transgender-identified.<sup>18</sup> Since identical twins contain 100 percent of the same DNA from conception and develop in exactly the same prenatal environment exposed to the same prenatal hormones, if genes and/or prenatal hormones contributed to a significant degree to transgenderism, the concordance rates would be close to 100 percent. Instead, 80 percent of identical twin pairs were discordant. This would indicate that at least 80 percent of what contributes to transgenderism as an adult in one co-twin consists of one or more non-shared post-natal experiences including but not limited to non-shared family experiences.

36. These findings also mean that persistent GD is due predominately to the impact of non-shared environmental influences. These studies provide compelling evidence that discordant gender is not hard-wired genetically.

### **Gender Dysphoria vs. Gender Identity Disorder**

37. Up until the recent revision of the DMS-IV criteria, the American Psychological Association (APA) held that Gender Identity Disorder (GID) was the mental disorder described as a discordance between the natal sex and the gender identity of the patient.

38. Dr. Kenneth Zucker, who is a highly respected clinician and researcher from Toronto carried on evaluation and treatment of GID patients for forty years. His works, widely published, found that the vast majority of boys and girls with GID identify with their biological sex by the time they emerge from puberty to adulthood, through either watchful waiting or family and individual counseling.<sup>19</sup> His results were mirrored in studies from Europe.<sup>20, 21</sup>

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<sup>18</sup> Diamond, M. "Transsexuality Among Twins: identity concordance, transition, rearing, and orientation." *International Journal of Transgenderism*, 14(1), 24–38.

<sup>19</sup> Zucker KJ, Gender Identity Disorder, in Rutter M, Taylor EA, editors. *Child and Adolescent psychiatry*, 4<sup>th</sup> ed, Malden Mass: Blackwell, 2006: 737-753.

<sup>20</sup> Wallien MS, Cohen-Kettenis PT. Psychosexual outcome of gender-dysphoric children. *J AM Academy Child Adolescent Psychiatry* 2008; 47:1413-1423.

39. When the DMS-V revision of the diagnosis of GID was proposed by the APA committee responsible for revision, Dr. Zucker strongly opposed the change to the term Gender Dysphoria, which purposefully removed gender discordance as a mental disorder apart from the presence of significant emotional distress. With this revision, Gender Dysphoria describes the mental anguish which is experienced by the gender discordant patient.

40. The theory that societal rejection is the root cause of Gender dysphoria was validly questioned by a study from Sweden which showed that the dysphoria was not eliminated by hormones and sex reassignment surgery even with widespread societal acceptance.<sup>22</sup>

### **Treatment of Gender Dysphoria**

41. The treatment of the child and adolescent with gender discordance and accompanying gender dysphoria should include an in-depth evaluation of the child and family dynamics. This provides a basis on which to proceed with psychologic therapy. The entire biologic and social family should be involved in psychological therapy designed to assist the patient, if at all possible, to align gender identity with natal sex. Psychological support by competent counselors with an intent of resolving the gender conflict should be provided as long as the patient continues to suffer emotionally. Given the high degree of eventual desistance of gender discordance/dysphoria by the end of puberty, it would be ethical and logical to counsel the patient and family to rear the child in conformity with natal sex.

42. There should be no interruption of natural puberty. Natural pubertal maturation in accordance with one's natal sex is not a disease. It is designed to carry a malleable, immature individual forward to be a healthy adult capable of conceiving their own progeny. It affects

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<sup>21</sup> Schechner T. Gender Identity Disorder: A Literature Review from a Developmental Perspective. *Isr J Psychiatry Related Sci* 2010; 47:42-48.

<sup>22</sup> Dhejne, Cecilia et al. Long-term Follow- up of transsexual Persons Undergoing Sex Reassignment Surgery: Cohort Study in Sweden *PLoS One* February 2011 Vol 6 Issue 2, e16885

physical changes, some of them painful, unique to the natal sex to reflect the laws of nature. Interruption of puberty has been reserved for children who begin puberty at an age much younger than normal in an effort to preserve final height potential and avoid the social consequences of precocious maturation. There are a number of physical changes that are a consequence of normally-timed puberty which could be classified as disadvantageous: changes in body proportions can alter success with dance and gymnastics; acne can be severe and disfiguring; a boy soprano can suddenly hardly carry a tune. It has not been the ethical standard of care to stop puberty so that these changes can be circumvented.

43. Erikson described the stage of adolescence as "Identity versus Role Confusion" during which the teen works at developing a sense of self by testing roles then integrating them into a single identity.<sup>23</sup> This process is often unpleasant regardless of the presence or absence of gender identity conflicts. The major benefit of enduring puberty in a GD patient is that it provides a strong likelihood of alignment of his gender identity with his natal sex. There is no doubt that these patients need compassionate care to get them through their innate pubertal changes. The light at the end of the tunnel for them is the proven scientific evidence that 80%-95% of pre-pubertal children with GD will come to identify with their biological sex by late adolescence. Some will require lifelong supportive counseling, and others will not.<sup>24</sup>

44. Intervention at a young age with gonadotropin releasing hormone analogs (often referred to as puberty blockers) to either stop puberty early on or prevent it from starting before it naturally occurs is suggested by guidelines developed by WPATH without scientific basis.

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<sup>23</sup> Erikson, E. H. (1993). *Childhood and society*. WW Norton & Company. Erikson, E. H. (1993). *Childhood and society*. WW Norton & Company.

<sup>24</sup> Zucker KJ, Gender Identity Disorder, in Rutter M, Taylor EA, editors. *Child and Adolescent psychiatry*, 4<sup>th</sup> ed, Malden Mass: Blackwell, 2006: 737-753.

There is evidence that bone mineral density is irreversibly decreased if puberty blockers are used during the years of adolescence.<sup>25</sup>

45. To treat puberty as a pathologic state of health that should be avoided by using puberty blockers (GnRH analogs) is to interrupt a major necessary physiologic transformation at a critical age when such changes can effectively happen. We have definite evidence of the need for estrogen in females to store calcium in their skeleton in their teen years. That physiologic event can't be put off successfully to a later date. It is very difficult to imagine ethical controlled clinical trials that could elucidate the effects of delaying puberty until the age of consent (18 years). The use of cross-sex hormones during this same time frame has no basis of safety and efficacy. The use of such treatment in adults raises scientifically valid concerns that were amply expressed in the 2009 Endocrine Society Guidelines on Transgender treatment.

46. The next step in WPATH-recommended intervention is to use cross-sex hormone therapy during the time when the patient would naturally be experiencing endogenous pubertal changes. This too is not based on scientifically proven theories. The use of cross-sex hormones can cause permanent infertility.<sup>26</sup>

47. The final recommended step is so-called "sex reassignment surgery," which can include surgical removal of the breasts in natal females, or removal of the penis and scrotum in natal males. Each of these steps have adverse outcomes, some reversible and others not. Mastectomies leave scars, and there is great difficulty in creating a functional vaginal-like orifice, and certainly no success in creating an innervated erectile penis where none existed previously. Sex reassignment surgery is, by nature, permanent.

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<sup>25</sup> *J Clin Endo Metab* 2008;93:190-195.

<sup>26</sup> Hembree WC et al, Endocrine Treatment of Transsexual Persons: and Endocrine Society Clinical Practice Guideline, *J Clin Endo Metab*2009; 94:3132-3154.

### Science vs. Pseudoscience

48. The advent of “centers of excellence” for gender-disordered patients<sup>27</sup> combined with sociologic agenda in academia has created the impression that there is scientific validity to gender discordance as a variation of normal. There has been a flurry of non-peer-reviewed articles in journals and newsletters circulated to general pediatricians that promote the ideology of transgenderism without scientific support.<sup>28, 29, 30, 31</sup> Mainstream clinicians and scientists who consider gender discordance to be a mental disorder have been deliberately excluded in the makeup of the steering committees of academic and medical professional societies which are promulgating guidelines that were previously unheard of.

49. The Endocrine Society published such a document in 2009.<sup>32</sup> Its recommendations promoted the use of psychological evaluation, counseling, blocking of pubertal maturation at the onset of puberty, the subsequent use of cross- sex hormones, and possible surgical intervention at the age of consent. Of the 22 recommendations contained in the document, only three were supported by scientific proof. These three warned of potential adverse effects of hormonal manipulation. The remaining 19 recommendations were nearly evenly split into a group that was based on very limited scientific evidence and a group that was based on absolutely no scientific evidence at all. The response to these guidelines was an exponential burgeoning of Gender Identity Clinics in the United States from three to over forty-five in a period of seven years.

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<sup>27</sup> Hsieh S and Leninger J, Resource List: Clinical Care Programs for Gender-Nonconforming Children and Adolescents, *Pediatr Ann* 2014;43:238-244.

<sup>28</sup> Prager, LM, A boy who wants to be a girl, *Contemporary Pediatrics* 2008; 25:56-58.

<sup>29</sup> Garafolo R Tipping points in caring for the gender-non-conforming child and adolescent, *Pediatr Ann* 2014; 43:227-229.

<sup>30</sup> Steever J, Cross-gender Hormone therapy in adolescents, *Pediatr Ann* 2014;43: e-138-e-144.

<sup>31</sup> Simons LK et al, Understanding gender variance in Children and Adolescents, *Pediatr Ann*2014;43:e-126-e131.

<sup>32</sup> Hembree WC et al, Endocrine Treatment of Transsexual Persons: and Endocrine Society Clinical Practice Guideline, *J Clin Endo Metab*2009; 94:3132-3154.



50. What is missing is sound science to show that gender identity discordance is not a delusional state. What is happening is reminiscent of the now-discredited efforts of John Money. There is an ongoing multicenter study, funded by the NIH, which will be empirically starting gender discordant children and adolescents, all below the age of consent, on treatment with puberty blockers and cross-sex hormone treatments. There is no control group in this study.

51. The gender discordant individual is given protected civil rights as if the discordant gender identity is innate, when there is no credible science to prove such, and in fact, much credible science to refute it. Recognized experts in the field, such as Kenneth Zucker, are banned from providing psychotherapy to assist youth in aligning their gender identity with their biological sex.

52. The norm for human development is for one's thoughts to align with physical reality, and for one's gender identity to align with one's biologic sex. Gender identity that does not match natal sex is a mental disorder, previously called Gender Identity Disorder.

53. WPATH is an agenda-driven advocacy organization whose membership consists of anyone who has an interest in the transgender social and political agenda. There are no requirements for specialty training or certification. Its guidelines are not scientifically supported.

54. WPATH promotes "expert witnesses" and provides them with a bibliography replete with self-confirming references to opinion pieces and anecdotal case reports along with clinical case reviews with inherent selection bias.

55. WPATH's "peer-reviewed" journal is not reviewed by anyone with an opinion that is not in keeping with the philosophy of the organization itself. WPATH pressured the authors of the Swedish study to retract their results clearly showing persistent mental health problems among transgendered adults even after WPATH-recommended transition treatment. When Dr. Zucker,

the then-editor of the journal that published the study, refused to allow the authors do so, he was targeted by activists and his Toronto clinic was shut down by the Canadian government shortly thereafter.


56. Laws banning treatment designed to support gender resolution appear aimed at a fear that allowing the gender discordant individual to return to their chromosomal sexual identity will do harm, when what we know is that he or she will most likely assume a role as a heterosexual or homosexual adult living in and identifying with the body given them by nature.

### **Conclusion**

57. Young children and adolescents are vulnerable to recruitment to an ideology of gender fluidity, which is theorized by various agenda-driven health professionals and groups, and which is amplified on the internet by profoundly unscientific websites and blogs. After my fellowship completion, it was not until 16 years later that I encountered a patient with Gender Identity Disorder. At that time, I consulted all of the mentors in pediatric endocrinology across the country that I respected, and none of them could give me a suggestion of where to send the patient for valid psychological care. Since the flurry of published articles lacking in valid science, and the emergence of transgender clinics across the nation in recent years, I have seen an uptick in case referrals. Based on the proven results of Kenneth Zucker, I seek out and send these patients to competent mental health providers who thoroughly assess the family psychological environment, treat any psychological comorbidities in the child, and support the child through puberty. This course of treatment offers patients the best hope of recovery and a healthy, productive life.

58. Pursuant to 28 U.S.C § 1746, I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Date: 12 August, 2016

Signed:   
\_\_\_\_\_  
Quentin L. Van Meter, M.D.

**QUENTIN L. VAN METER, M.D.**  
1800 Howell Mill Road NW, Suite 475  
Atlanta, Georgia 30318

**updated 11 July 2016**  
**(678) 961-2100**

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**PERSONAL**

Home Address: 1080 Peachtree St. NE #3507, Atlanta, GA 30309  
Home Phone: (404) 963-5618  
Date of Birth: September 13, 1947  
Place of Birth: Laramie, Wyoming  
Citizenship: USA

**EDUCATION:**

Undergraduate: College of William & Mary, 1969  
B.S. – 1969  
Medical School: Medical College of Virginia, 1973  
M.D. – 1973

**CLINICAL TRAINING:**

Institution: The University of California, San Francisco  
Hospital: Naval Regional Medical Center, Oakland  
Position: Pediatric Intern – 1973 – 1974  
Pediatric Resident – 1974 – 1976  
  
Institution: Johns Hopkins University  
Hospital: Johns Hopkins Hospital  
Position: Fellow, Pediatric Endocrinology 1978 – 1980  
Fellowship Program Director: Claude Migeon, M.D.  
  
Current Position: Pediatric Endocrinologist  
Van Meter Pediatric Endocrinology, P.C.  
1800 Howell Mill Road, Suite 475  
Atlanta, Georgia 30318

**PROFESSIONAL CERTIFICATION & SOCIETIES:**

Diplomate, National Board of Medical Examiners, 1974  
  
American Board of Pediatrics, certified in general pediatrics, 1978, sub-board certified in Pediatric Endocrinology, 1983

Quentin L. Van Meter, M.D.

Fellow: American Academy of Pediatrics, 1975 -2014  
President, Uniformed Services West Chapter, 1987 – 1990  
District VIII member, AAP Committee on Awards for  
Excellence in Research, 1990-1994  
Editor, The Georgia Pediatrician, 1994 – 1998  
  
Chairman, Georgia Chapter Legislative Committee, 1996 – 2006

Fellow: The American College of Pediatricians, 2007 – present  
Member of the Board of Directors, 2008- present  
Vice President/President Elect, 2015-present

Member: Pediatric Endocrine Society, 1989 – present

Member: American Diabetes Association Professional Section, 1988 – present

Member: Endocrine Society, 1994-present

Member: Southern Pediatric Endocrine Society, 1992 – Present

Member: American Association of Clinical Endocrinologists, 2005 – present

Licensure: Georgia, #34734

#### FACULTY POSITIONS:

Institution: Morehouse School of Medicine  
Position: Associate Clinical Professor, Pediatrics, 2004 – present

Institution: Emory University School of Medicine  
Position: Associate Adjunct Professor, Pediatrics, 1991 – present

Institution: University of California, San Francisco  
Position: Associate Clinical Professor, Pediatrics, 1989 – 1991

Institution: University of California, San Diego, School of Medicine  
Position: Assistant Clinical Professor, Pediatrics, 1980 – 1986

Institution: LSU School of Medicine, Clinical Instructor, Pediatrics, 1977 – 1978

#### MILITARY SERVICE:

Commission: Medical Corps, United States Navy, August 1971  
Rank: Captain, retired  
Duty Stations: Health Professional Scholarship Student, 1971 – 1974  
  
Intern and Resident, Pediatrics, Naval Regional Medical Center,  
Oakland, 1973 – 1976  
  
Staff Pediatrician, Naval Regional Medical Center,  
Oakland, 1976

Quentin L. Van Meter, M.D.

Staff Pediatrician, Naval Regional Medical Center,  
New Orleans, 1976 – 1978

Full time out-service fellow in Pediatric Endocrinology,  
Johns Hopkins Hospital, 1978 – 1980

Staff Pediatric Endocrinologist, Naval Hospital San Diego,  
1980 – 1986

Chairman and Director, Residency Training, Department of Pediatrics  
Naval Hospital Oakland, 1986 – 1991

**OTHER PROFESSIONAL ACTIVITIES:**

Consultant, Pediatric Endocrinology,  
Nellis Air Force Base Hospital, Las Vegas, Nevada  
1981 – 1991

Consultant, Pediatric Endocrinology,  
Naval Hospital Lemoore, CA  
1986 – 1991

Consultant, Pediatric Endocrinology,  
Letterman Army Medical Center, Presidio of San Francisco, CA  
1990 – 1991

Consulting Endocrinologist,  
Columbus Regional Medical Center, Columbus, GA  
1991 – 1994

Pediatrician and Pediatric Endocrinologist, partner  
Fayette Medical Clinic  
Peachtree City, Georgia 30269  
September 1991 – October 2003

Pediatric Endocrinologist Peer Reviewer                    2006 – present  
MCMC, LLC, Boston, MA  
IMEDECS, Lansdale PA

Speaker's Bureau  
Novo Nordisk, Pfizer, Endo, Abbvie  
AAP Eqipp course on Growth- development committee- 2012

PUBLICATIONS: (Articles in Peer Reviewed Journals)

Riddick, JR, Flora R., Van Meter, QL:  
“Computerized Preparation of Two-Way Analysis of Variance  
Control Charts for Clinical Chemistry,” Clinical Chemistry,  
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Van Meter, QL, Gareis FJ, Hayes, JW, Wilson, CB:  
“Galactorrhea in a 12 Year Old Boy with Chromophobe Adenoma,”  
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Plotnick, LP, Van Meter, QL, Kowarski, AA, “Human Growth Hormone  
Treatment of Children with Growth Failure and Normal Growth  
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Somatomedin Generation: Pediatrics 71:324, March 1983.

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Med., 145:514015, October 1986.

Van Meter, QL, “The Role of the Primary Care Physician in Caring for  
Patients with Type-1 Diabetes,” Comp Ther 1998; 24(2):93–101

Midyett LK, Rogol AD, Van Meter QL, Frane J, and Bright GM,  
“Recombinant Insulin-Like Growth factor (IGF)-I Treatment in Short  
Children with Low IGF-I Levels: First-Year Results from a Randomized  
Clinical Trial,” J Clin Endocrinol Metab, 2010;95:611–619.

ABSTRACTS:

Van Meter, Q L, & Lee, PA: “Evaluation of Puberty in Male and Female  
Patients with Noonan Syndrome,” Pediatric Research 14:485, 1980.

Van Meter, QL, et al: “Characterization of Pituitary Function in  
Double Bolus GnRH Infusion as a Diagnostic Tool,” Pediatric Research  
32:111, 1984.

Van Meter, QL, Felix, SD, Lin, FL: “Evaluation of the Pituitary-Adrenal  
Axis in Patients Treated with nasal Beclomethasone,” (Presented at the  
1991 Annual Meeting of the Endocrine Society and the 6<sup>th</sup> Annual Naval  
Academic Research Competition, Bethesda, MD, 17 May, 1991).

Rogol AD Midyett LK Van Meter Q, Frane J, Baily J, and Bright GM,  
Recombinant Human IGF-1 for Children with Primary IGF-1 Deficiency  
(IGFD): Safety Data from Ongoing Clinical Trials (presented at the PAS  
2007, Toronto).

Van Meter Q, Midyett LK, Deeb L et al, Prevalence of primary IGF1 among untreated children with short stature in a prospective, multicenter study (Poster POO715) ICE Rio de Janeiro, Brazil 2008.

G.M. Bright<sup>1</sup>, W.V. Moore<sup>2</sup>, J. Nguyen<sup>3</sup>, G. Kletter<sup>4</sup>, B. S. Miller<sup>5</sup>, Q. L. Van Meter<sup>6</sup>, E. Humphriss<sup>1</sup>, J.A. Moore<sup>7</sup> and J.L. Cleland<sup>1</sup> Results of a Phase 1b Study of a new long-acting human growth hormone (VRS-317) in pediatric growth hormone deficiency (PGHD). PAS 2014 May 2014

Van Meter Q, Welstead B and Low J, Characteristics of a Population of Obese Children and Adolescents: Suggesting a New Paradigm, presented at ESPE meeting, Dublin 2014.



ADDITIONAL PRESENTATIONS/LECTURES:

Pediatrics Update, CME Associates, San Diego – Orlando Annual Conferences: Lectures on Pediatric Endocrine Subjects – 1986 – 2001. Course Moderator, 1997, 1998, 1999, 2000, 2001

Endocrine and Gastroenterology Update, CME Associates, Maui HI Nov 2001, Lecturer and Course Moderator

Lecture on Panhypopituitarism, Pharmacia Conference, Nashville TN April 2002.

Family Medicine Review Course, Orlando, FL, 1992 – 2001

Pediatric Grand Rounds, Tanner Medical Center, October 1997

Pediatric Grand Rounds, Hughes Spaulding Children’s Hospital, September, 2003

Pediatrics in the Park, Fall CME meeting for the Georgia Chapter of the American Academy of Pediatrics, November 2003

Pediatric Grand Rounds, Columbus Regional Medical Center, January 2004

Frontiers in Pediatrics CME Course, sponsored by the Atlanta Children’s Health Network, Atlanta, March 2004.

Pediatric Grand Rounds, Eggleston Children’s Hospital, May 2004.

Sue Schley Matthews Pediatric Conference, Columbus Regional Medical Center, September 2004

56<sup>th</sup> Annual Scientific Assembly and Exhibition of the Georgia Academy of Family Physicians, Nov 2004

Program Co-Chairman: Southern Pediatric Endocrine Society Annual meeting, Nov 2004

Presentations on Diabetes, Growth Failure, and Thyroid Disease to the Postgraduate Pediatric Nurse Practitioner Program, Georgia State University, Nov 2005, June 2006, May 2007

Issues in Medicine, US Medical Congress Conference and Exhibition, Las Vegas, meeting planner and speaker, June, 2006

CME Presentations for the Georgia Chapter of the American Academy of Pediatrics Spring and Fall Meetings 2004-present

Quentin L. Van Meter, M.D.

Pediatric Grand Rounds, Columbus Regional Medical Center, Columbus, GA, 2011-present

Human Growth Foundation Regional CME Conference, Atlanta GA  
March 2013, February 2014 Columbus Georgia

Audio Digest Pediatrics - ① v. 41, no. 4; ② v. 41, no. 20; ③ v. 43, no. 17

Audio Digest Family Practice - ① v. 42, no. 5; ② v. 44, no. 11; ③ v. 44, no. 44; ④ v. 45, no 15

Audio Digest Otolaryngology - ① v. 32, no. 14

**CURRENT HOSPITAL APPOINTMENTS:**

Eggleston/Scottish Rite Children's Hospitals, active  
staff, Pediatric Endocrinology

**PAST AND CURRENT CLINICAL RESEARCH:**

2006	Sanofi-Aventis HMR1964D/3001	study completed 2007
2006	Tercica MS301-	study completed 2008
2007	Tercica MS310-	study completed 2008
2007	Tercica MS306-	study completed 2010
2007	Tercica MS316-	study completed 2012
2008	EMD Serono 28358	study completed 2009
2012	Versartis 12VR2	study completed 2014
2012	Debiopharm 8206-CPP-301	study started July 2012
2013	Versartis 13 VR3	study started Dec 2013
2014	Novo-Nordisk Elipse	study started 2014
2015	Versartis 14 VR4	study started September 2015

**UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF NORTH CAROLINA**

JOAQUÍN CARCAÑO *et al.*,

Plaintiffs,

v.

PATRICK MCCRORY *et al.*,

Defendants

CASE NO. 1:16-CV-00236-TDS-JEP

UNITED STATES OF AMERICA,

Plaintiff,

v.

STATE OF NORTH CAROLINA *et al.*,

Defendants

CASE NO. 1:16-CV-00425-TDS-JEP

**DECLARATION OF ALLAN M. JOSEPHSON, M.D.**

1. I have been retained by counsel for Defendants as an expert witness in connection with the above-captioned litigation. I have actual knowledge of the matters stated in this declaration. My professional background, experience, and publications are detailed in my curriculum vitae, a true and accurate copy which is attached as Exhibit A to this declaration.

2. I received my medical degree (M.D.) from the University of Alberta in 1976, after which I did residencies in psychiatry and child and adolescent psychiatry at the University of Minnesota. I served on the faculties of medicine at the University of Minnesota and Medical College of Georgia before assuming my current position at the University of Louisville.

**EXHIBIT 3**

3. I am currently Professor and Chief of Child, Adolescent and Family Psychiatry at the University of Louisville School Of Medicine, where I also hold position of CEO of the Bingham Clinic.

4. I am board certified in psychiatry and child and adolescent psychiatry. I have been licensed to practice medicine in the past in Minnesota and Georgia and in Kentucky since 2003.

5. In my career I have evaluated, treated, and consulted with approximately 35 transgender young people. These contacts have been among approximately 15,000 patients I have seen with psychiatric concerns in outpatient, inpatient, medical wards, residential treatment centers, schools, detention centers, and private psychotherapy offices. Many of these evaluations included assessments of the child's family.

6. I am a member of the American Psychiatric Association (Distinguished Life Fellow), American Academy of Child and Adolescent Psychiatry, Group for the Advancement of Psychiatry, American Medical Association, and the American College of Psychiatrists.

7. My opinions as detailed in this declaration are based upon my knowledge and direct professional experience in the subject matters discussed. The materials that I have relied upon are the same types of materials that other experts in my field rely upon when forming opinions. A list of sources relied upon is attached as Exhibit B to this declaration.

8. In the past four years I have testified as an expert for a trial or deposition in the following matters: *Bruscato, Vito v. Gwinnett-Rockdale-Newton Community Service Board, Superior Court of Gwinnett County State of Georgia*, Civil Action No. 04-A-5858-3 (DeKalb County Superior Court); *Landry, Lisa and Landry Michael v. Damond Logsdon, Ph.D.*, Civil Action No. 14EV002151F (Fulton County Superior Court).

9. I am being compensated at an hourly rate for actual time devoted, at the rate of \$350 per hour. My compensation does not depend on the outcome of this litigation, the opinions I express, or the testimony I provide.

### **Sex and Gender Defined**

10. Sex is the term used to categorize individuals on the basis of their ability to procreate, and thus continue the human race. It is an objective fact based on the science of genetics and leads to a binary recognition of all humans, male and female. The chromosomal complement is XX for female and XY for male. It is a binary organization of humankind and it is fixed/immutable.

11. In disease there are extremely rare variations of genetic expression referred to as intersex conditions or disorders of sexual development (DSD), such as congenital adrenal hyperplasia. These diseases can lead to difficulty identifying the correct sex at birth due to ambiguous genitalia.

12. Gender (often used interchangeably with gender identity) refers to a person's basic sense or awareness of themselves as male or female. It includes the knowledge that one is male or female and an emotional appraisal of this knowledge. Gender is a psychological construct and by definition cannot be present at birth, but rather evolves throughout development. It is culturally and societally influenced.

### **Gender Development**

13. The processes of human development are sequential, moving from the simple to the complex. Each stage of development is related to the previous one and prepares for the successive one.

14. Over decades of psychological work and research, the tasks of the following general developmental stages are accepted. The healthy child must learn to:

- trust other human beings;
- accept the boundary between self and others, especially the boundary of limits on one's behavior;
- socialize and relate to others;
- acquire specific facts and skills to be applied to life experience (e.g., academic tasks);
- develop a sense of self or self-identity: understanding what activities an individual is suited for, including male and female roles.

15. Children and adolescents have individual temperaments that are shaped into identity by environmental experience, typically family experiences. The external inputs from family and others become consolidated into an internal sense of self.

16. Whereas sex is a biological fact rooted in genetics, gender is a psychological construct or perception which begins with the fact of sex and then is developed through the experiences of life. Thus, efforts to determine or assign gender at the time of birth are unfounded and by definition impossible.

17. Gender identity refers to an individual's personal sense of self as male or female. In the vast majority of cases, it is concordant with an individual's biological sex and remains stable over the lifetime. It initially develops early in life, around the ages 3 to 4, and is continually shaped and modified by interactions with the environment, typically family and parental influences.

18. The concept of gender identity first developed from the work of clinicians in the 1950s working with children born with disorders of sexual development (i.e., physical inspection of the genitalia at the time of birth made it difficult to determine if a child was male or female).

### **Gender Incongruity**

19. In the vast majority of individuals, gender identity, generally established in childhood, is consistent with biological sex and remains stable.

20. Gender conformity exists for most children with play and playmate preferences. Rarely some children exhibit evidence of gender non-conformity. Gender non-conformity refers to behaviors or preferences that do not conform to those typical of the child's sex. Gender non-conformity does not necessarily indicate psychological pathology; there are healthy, well-adjusted boys who like to play with dolls and girls who like to climb trees.

21. Gender Dysphoria is a diagnostic term that characterizes a person's sense of discomfort or unease about his or her status as a male or female. The diagnostic criteria for gender dysphoria in children and adolescents are set forth in DSM 5 (302.85) as follows:

- A. A marked incongruence between one's experienced/expressed gender and assigned gender, of at least 6 months duration, as manifested by at least two of the following:
  1. A marked incongruence between one's experienced/expressed gender and primary and/or secondary sex characteristics (or in young adolescents, the anticipated sex characteristics).
  2. A strong desire to be rid of one's primary/and or secondary sex characteristics because of a marked incongruence with one's experienced/expressed gender (or in young adolescents, a desire to prevent the development of the anticipated secondary sex characteristics).
  3. A strong desire for the primary and/or secondary sex characteristics of the other gender.
  4. A strong desire to be of the other gender (or some alternative gender different from one's assigned gender).
  5. A strong desire to be treated as the other gender (or some alternative gender different from one's assigned gender).
  6. A strong conviction that one has the typical feelings and reactions of the other gender (or some alternative gender different from one's assigned gender).
- B. The condition is associated with clinically significant distress or impairment in social, occupational, or other important areas of functioning.

22. Prior to DSM-5 (the psychiatric diagnostic manual), the diagnosis of Gender Identity Disorder was used to describe individuals with gender incongruence. This was unacceptable to some and became controversial. The key area of controversy was over the degree to which the diagnostic criteria for gender identity disorder reflected an illness or social bias against gender incongruence.

23. This controversy led to the decision to remove “disorder” as a definitional component of the diagnosis of gender dysphoria. It remained a disorder only for the affects (distress) associated with the experience of gender discordance (commonly known as transgenderism). These affects were primarily seen as deriving from bias and social ostracism by proponents of the revision.

24. Changes in diagnostic nomenclature in this area were not initiated through the result of scientific information but rather the result of cultural changes fueling political interest groups within professional organizations. The diagnosis remained in the current diagnostic manual in part to facilitate continued access to mental health care.

25. Among psychiatrists, it remains a matter of debate whether gender incongruence reflects a psychopathology or a variant of normal human functioning with concomitant psychiatric distress.

26. Longitudinal studies of pre-pubertal children, including those without mental health treatment, indicate that for the majority of children studied, cross-gender wishes or desires typically fade over time and do not persist into adulthood. Studies range from approximately 65% to 95% of youth no longer being gender incongruent by late adolescence.

27. When gender discordance continues well into adolescence, it is more likely to continue into adulthood.



28. When gender discordance remits, it is thought to be due to increased cognitive flexibility, meaning that as children mature they can realize they can still be a boy or girl despite their behavior varying from conventional gender roles and norms.

29. The etiology of transgender behavior is not definitively known, but almost all psychiatric disorders are heavily influenced by the early years of development.

30. Putative biological factors have included genetics, differences in central nervous system lateralization and abnormal EEG findings, but findings have been inconsistent and inconclusive. It should be noted that these findings are of a correlational nature with causation unproven. At the present time, research has been unable to identify a clear biological anomaly associated with gender discordance. What can be said is biological influences, as in most psychiatric disorders, are likely influential but not all determinant.

31. Healthy identification with (i.e., “becoming like”) the same-sex parent is an important part of child development. When this does not take place, individual parental factors and parent relationship factors are typically responsible and the impact on a child’s developing identity is significant. For example, a major impact of father absence and father psychopathology is seen in many adolescent clinical problems. The extent to which it influences gender discordance is not known and is an area of needed research.

32. Familial psychopathology is common. Control studies have shown an increased incidence of parental psychopathology in boys with gender discordance although a causal relationship cannot be definitively established.

33. Gender incongruent youth typically have other problems, referred to in the literature as comorbidities—most often anxiety, depression and suicidal thinking. A recent large-scale study showed that children with gender dysphoria were much more likely to have self-harm ideation,

suicidal thinking, depression, overall significantly increased behavior problems and poor peer relations.

### **Treatment**

34. There is a paucity of research data on the treatment of gender discordance,, particularly in children and adolescents. There are no controlled studies assigning youth to either psychological intervention or medical intervention groups.

35. It is known that the majority of children and youth who identify as transgender will cease/desist by late adolescents with conservative treatment.

36. Children are not equipped psychologically to make many important life decisions and thus are gradually transitioned into making these decisions themselves – “the external becomes internal.”

37. It is an abdication of parental responsibility to allow a child to “decide for themselves” regarding key life decisions. On the other hand sensitivity, flexibility and wisdom are necessary in facilitating a trial-and-error approach as the child reaches the age of emancipation.

38. The consequences of a decision to change genders are dire and often permanent, and cannot be fully appreciated until young adulthood. These include social, medical, and psychiatric consequences. It is important for the parents to provide empathic guidance to aid adolescent decision-making.

39. It is unlikely that most adolescents understand the effects of hormone treatments and potential effects on fertility.

40. Considering the dire risks of psychopathology, suicidal behavior, peer rejection, and the known risks of transition treatment and lifelong hormone use, including permanent sterility, combined with the likelihood that gender discordance will remit (desist) by the end of puberty, a

thorough exploration of contributing factors and empathic guidance in aligning gender with natal sex is indicated.

41. Children and adolescents should receive individual therapy to understand some of the factors that fuel the desire to become a member of the opposite sex and attempt to resolve any conflicts and problems rather than solely be affirmed in the belief that they were born in the “wrong body.”

42. In psychiatry, a delusion is defined as a fixed, false belief which is held despite clear evidence to the contrary. In psychiatric practice, patients with the common diagnosis of anorexia nervosa have the false belief that they are overweight (“fat”) in spite of overwhelming evidence of their cachexia. Similarly, those who are gender incongruent believe they are of the opposite sex despite clear and overwhelming evidence to the contrary.

43. Parents should receive guidance/counseling to help a child feel more comfortable about being a girl or boy. This would include assisting the child in mastering basic cognitive concepts of gender, encouraging the development of same-sex friendships in areas where mutual interest can be identified, and empathic limit-setting on cross-gender behavior with the encouragement of gender-neutral or sex-typical behavior. It is important for parents to be sensitive to the child’s temperamental characteristics while structuring the child’s experience in planning and encouraging peer group encounters.

44. This approach has support in the clinical guidelines literature. However, there is a paucity of randomized, controlled treatment trials in the literature. Given this lack of evidence, the knowledge that the condition remits by young adulthood and the dire risks of a gender incongruence position, a conservative, development-enhancing therapeutic approach is indicated.

45. An assessment of family functioning, including assessment of parental psychopathology is indicated.

46. The adolescent must always be affirmed as a person but this does not imply an immediate rush to affirmation of a transgender adolescent choice before the issues are explored. This is consistent with parental approaches to all the major life decisions of adolescents and is a necessary parental executive function to counter adolescent cognitive impulsivity.

### Conclusion

47. As culture influences psychiatry more and more, there is increasing confusion between defending the rights of patients versus treating these patients. This is manifested in viewing gender dysphoria in terms of rights needing defending rather than a psychiatric condition needing compassionate and scientifically accurate treatment. This view does not serve our patients well.

48. Pursuant to 28 U.S.C § 1746, I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Date: August 11, 2016

Signed: Allan M. Josephson, M.D.  
Allan M. Josephson, M.D.

## Exhibit B

### Bibliography for Expert Allan M. Josephson, M.D.

Adelson, S. (Primary Author). Practice Parameter on Gay, Lesbian, or Bisexual Orientation, Gender Nonconformity, and Gender Discordance in Children and Adolescents. *J Am Acad Child Adolesc*, 2012; 51:957-974.

Aitken, M et al. Self Harm and Suicidality in Children Referred for Gender Dysphoria. *J Am Acad Child Adolesc Psychiatry*, 2016, 55:513-520. . *J Am Acad Child Adolesc Psychiatry*, 2016, 55:513-520.

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Cretella, M.A. Gender Dysphoria in Children and Suppression of Debate. *Journal of American Physicians and Surgeons*, 2016, 21:50-54.

Dhejne, C. et al. Long Term Follow Up of Transsexual Persons Undergoing Sex Reassignment Surgery: Cohort Study in Sweden. *PLoS ONE* 6(2):e16885. DOI: 10.1371/journal.pone.0016885

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Josephson, A. M. Family Intervention as a Developmental Psychodynamic Therapy. *Child and Adolesc Psych Clin N Am*, 2013, 22:241-260.

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Rettew, D. Child Temperament: New Thinking About the Boundary Between Traits and Illness. W.W.Norton, 2013, New York.

Sameroff A.(ed.) The Transactional Model of Developmentt: How Children and Contexts Shape Each Other. American Psychological Association, 2009, Washington, D.C.

Schechner, T. Gender Identity Disorder: A literature review from a Developmental Perspective. *Isr J Pschiatry Relat Sci* (2010) 47: 132-138.

Smith, M.K. and Matthews, B. Treatment for gender dysphoria in children: the new legal, ethical and clinical landscape. *Med Jnl of Australia*, 2015, 202: 102-105.

Wallien, M. and Cohen-Kettenis, P. Psychosexual Outcome of Gender Dysphoric Children. *J Am Acad Child and Adolesc Psychiatry*, 2008, 47: 1413-1423.

Zucker, K. and Bradley, S. Gender Identity and Psychosexual Disorders. *FOCUS: The Journal of Lifelong Learning in Psychiatry*, 2005: Vol. III (4): 598-617.

Zucker K. et al. Psychopathology in the Parents of Boys with Gender Identity Disorder. *J Am Acad Child Adolesc Psychiatry*, 2003, 42:2-4.

**CURRICULUM VITAE**

Allan M. Josephson, M.D.  
Professor of Pediatrics and Psychiatry  
Departments of Pediatrics and Psychiatry and Behavioral Sciences  
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**PERSONAL**

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Home Address: 7903 Bent Pine Court  
Prospect, Ky. 40059

Home Telephone: 502-292-2816

Date of Birth: November 19, 1951

Place of Birth: Vancouver, British Columbia, Canada

Citizenship: United States (naturalized)

Marital Status: June 28, 1974  
Jerral Bauman Josephson

Children: Sarah (12/17/80)  
Matthew (7/20/83)  
Rachel (7/5/88)

## **EDUCATION**

1974 B.M. Sc. (Psychology/Sociology), University of Alberta, Edmonton, Alberta, Canada

1976 M.D., University of Alberta, Edmonton, Alberta

## **POSTDOCTORAL TRAINING**

1976 - 1980 Resident in Psychiatry, Department of Psychiatry, University of Minnesota Medical School, Minneapolis, Minnesota

1979 - 1980 Chief Resident, Department of Psychiatry, University of Minnesota

1979 - 1981 Fellow in Child and Adolescent Psychiatry, Division of Child and Adolescent Psychiatry, University of Minnesota Medical School, Minneapolis, Minnesota

## **LICENSURE AND CERTIFICATION**

1976 Licentiate of the Medical College of Canada

1977 National Board of Medical Examiners

1978-1988 State of Minnesota Physicians and Surgeons

1982 American Board of Psychiatry and Neurology (#23615)

1982 Royal College of Physicians and Surgeons (Canada) in Psychiatry

1983 American Board of Psychiatry and Neurology in Child Psychiatry (#1739)

1985-2003 State of Georgia Physicians and Surgeons License (#028019)

2003 State of Kentucky (#37853)

## **ACADEMIC APPOINTMENTS**

1981 - 1983 Instructor, Division of Child and Adolescent Psychiatry, Department of Psychiatry, University of Minnesota

1983 - 1985 Clinical Assistant Professor, Department of Psychiatry, University of Minnesota Medical School, Minneapolis, Minnesota

1985 - 1994 Associate Professor of Psychiatry, Medical College of Georgia, Department of Psychiatry and Health Behavior

1994 - 2002 Professor of Psychiatry, Medical College of Georgia, Department of Psychiatry and Health Behavior



2003 - 2012 Professor of Psychiatry, University of Louisville School of Medicine, Louisville, Kentucky

2003 -2012 Associate in Pediatrics, University of Louisville School of Medicine, Louisville, Kentucky

2012 Professor of Pediatrics, University of Louisville School of Medicine, Louisville, Kentucky

2012 Associate in Psychiatry, University of Louisville School of Medicine, Louisville, Kentucky

### **CLINICAL / ADMINISTRATIVE APPOINTMENTS**

1978 – 1979 Psychiatric consultant to Hennepin County Adult Correction Facility, Minneapolis, Minnesota

1981- 1982 Staff Psychiatrist, Outpatient Services, Division of Child and Adolescent Psychiatry, University of Minnesota Hospitals, September

1982 – 1983 Attending Staff Psychiatrist, Adolescent Psychiatry Diagnostic and Treatment Unit, University of Minnesota Hospitals

1983 – 1985 Medical Director, Kiel Clinics, St. Paul, Edina and Fridley, Minnesota

1985 – 1990 Medical Director, Child and Adolescent Program, Georgia Regional Hospital at Augusta

1986 – 2002 Director of Training, Child and Adolescent Psychiatry Fellowship Program, Medical College of Georgia

1990 – 1991 Acting Chief, Division of Child, Adolescent and Family Psychiatry, Medical College of Georgia

1991 – 2002 Chief, Division of Child, Adolescent and Family Psychiatry, Medical College of Georgia

1997 – 2000 Director of Clinical Services, Department of Psychiatry and Health Behavior, Medical College of Georgia

2003 – Present Chief, Division of Child and Adolescent Psychiatry, Department of Psychiatry and Behavioral Sciences, University of Louisville School of Medicine

2003 – 2012 Vice Chair for Child and Adolescent Programs, Department of Psychiatry and Behavioral Sciences, University of Louisville School of Medicine

2003 – Present Chief Executive Officer, Bingham Clinic, Louisville, Kentucky

**COMMITTEE ASSIGNMENTS****Local:**

1980 - 1982 Clinical Clerkship Committee, University of Minnesota Medical School

1984 - 1985 University of Minnesota Child Psychiatry Fellowship Training Committee

1986 - 1990 Augusta Area Coalition for Children and Youth, Member

1986 - 1990 Patient Care Review Committee, Medical College of Georgia

1986 - 1990 Residency Education Committee, Medical College of Georgia

1986 - 2002 Chair, Training Committee in Child Psychiatry, Medical College of Georgia

1986 - 1993 Chair, Medical Student Education in Child Psychiatry and Member, Department of Psychiatry Medical Student Education Committee

1990 - 1991 Member, Advisory Council to Medical College of Georgia, Department of Pediatrics, Section of Adolescent Medicine

1990 - 2002 Member, Medical College of Georgia, Department of Psychiatry Executive/Finance Committee

1990 - 2002 Chair, Martha McCranie Lectureship Committee

1991 - 1993 Member Academic Council, Medical College of Georgia

1991 - 1999 Member, Medical College of Georgia, Ad Hoc Dean's Committee on Resident Dismissals

1991 - 1999 Member, Medical College of Georgia, Graduate Medical Education Steering Committee

1992 - 1998 Chair, Psychiatry Work Group Consulting to Executive Planning Committee for Medical College of Georgia, Children's Medical Center

1991 - 2002 Chair, Child Psychiatry Grand Rounds Committee

1992 - 1994 Member, Medical College of Georgia, Department of Psychiatry Newsletter Editorial Board

1993 - 1994 Member, Search Committee for Chair of Pediatrics of Medical College of Georgia

1993 - 1997 Member, Medical College of Georgia, Department of Psychiatry Space

Committee

- 1997 - 2002 Member, Medical College of Georgia, Department of Psychiatry Education Committee
- 1997 - 2000 Chair, Department of Psychiatry and Health Behavior, Appointment, Promotions and Tenure Committee
- 1997 - 2002 Committee Chair, Department of Psychiatry and Health Behavior, Clinical Faculty
- 1998 - 2000 Member, Department of Psychiatry and Health Behavior, Managed Care Committee
- 1998 - 2000 Member, Governance Committee, State of Georgia Mental Health and Mental Retardation Region 12 Collaborative Program
- 2003-2012 Member, Executive Committee, Department of Psychiatry and Behavioral Sciences, University of Louisville School of Medicine
- 2003-2010 Member, Education Committee, Department of Psychiatry and Behavioral Sciences, University of Louisville School of Medicine
- 2003-present Member Executive Committee, Kosair Children's Hospital, Louisville, Kentucky
- 2005-2012 Member, Risk Management Committee, Department of Psychiatry and Behavioral Sciences, University of Louisville School of Medicine
- 2010-2012 Member, Committee on Medical Student Wellness, University of Louisville School of Medicine

**National Committees:**

- 1983 - 1984 Director of Free University, Association for Academic Psychiatry
- 1984 - 1989 Chair, Section on Child and Adolescent Psychiatry, Association for Academic Psychiatry
- 1985 - Present Member, Committee on the Family, American Academy of Child and Adolescent Psychiatry
- 1986 Chairman, Family Therapy Institute, "The Family Therapy of Major Adolescent Psychopathology," American Academy of Child and Adolescent Psychiatry
- 1987 - 1989 Member, Recruitment Initiative in Child Psychiatry. Representatives from the American Psychiatric Association, American Academy of Child and Adolescent Psychiatry, American Association of Directors of Psychiatric Residency Training,

Society of Professors of Child Psychiatry, and the American Academy of Pediatrics

- 1988 - Present Specialist Site Visitor in Child Psychiatry for Residency Review Committee, (Psychiatry) of the Accreditation Council for Graduate Medical Education
- 1989 Co-Chair, Section on Child Psychiatry's Relationships with Adult Psychiatry Residency Training, National Conference on Recruitment in Child Psychiatry, San Diego, California
- 1989 - 1991 Association for Academic Psychiatry, Program Committee
- 1989 - 1995 American Psychiatric Association Program Committee
- 1989 - Present Senior Examiner in Child Psychiatry, American Board of Psychiatry and Neurology
- 1989 - Present Senior Examiner in Adult Psychiatry, American Board of Psychiatry and Neurology
- 1989 - 2004 Chair, Special Interest Group on Family Therapy, American Academy of Child and Adolescent Psychiatry
- 1991 - 2002 Chief Proctor, American Board of Psychiatry and Neurology, Part I Examinations
- 1995 - 2009 Chair, Committee on Family, American Academy of Child and Adolescent Psychiatry
- 1996 Chair, Family Therapy Institute. Family Assessment and Family Treatment: An Update. Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Philadelphia, PA
- 1997- 2004 Member, Selection Committee, Psychiatric Residency Curriculum Awards, National Institute for Health Care Research
- 1999 - 2002 Chair, Committee on Education and Training, Society of Professors of Child and Adolescent Psychiatry
- 1999 Member, Medical College of Georgia, Liaison Committee on Medical Education Task Force
- 2001 Chair, Family Therapy Institute, Family Therapy and Integrated Psychotherapeutic Treatments, American Academy of Child & Adolescent Psychiatry Annual Meeting, Honolulu, Hawaii
- 2002 – 2004 Program Chair, Society of Professors of Child and Adolescent Psychiatry

2006-2008 Membership Chair, Society of Professors of Child and Adolescent Psychiatry

**EDITORIAL ACTIVITIES**

1989 - Present Journal Reviewer:  
Academic Psychiatry  
Journal of American Academy of Child and Adolescent Psychiatry  
Family Process  
American Journal of Psychiatry  
Journal of Nervous and Mental Disease

2009 Asia Pacific Psychiatry

2003-2015 Editorial Board, Family Process

2000 – 2006 Editorial Board, Journal of American Academy of Child and Adolescent Psychiatry

**CONSULTANTSHIPS**

1981 - 1983 Consultant in Adolescent Psychiatry, Arlington House, Residential Treatment Center, St. Paul, Minnesota

1982 - 1983 Consultant in Psychiatry, Kiel Clinics (private mental health clinic), St. Paul, Minnesota

1983 - 1985 Consultant in Child Psychiatry, Northland Mental Health Center, Grand Rapids, Minnesota

1983 - 1985 Consultant in Child and Adult Psychiatry, Central Mesabi Medical Center, Hibbing, Minnesota

1985 - 1992 Consultant to Augusta Regional Youth Development Center, Augusta, Georgia

1987 Consultant to "Focus on the Family," Private Organization, Non-Profit, Los Angeles, California

1988 Consultant to C. Everett Koop, M.D., Surgeon General of the United States

1992 - 1993 Consultant in Family Therapy, American Academy of Child and

1996 - 1998 Adolescent Psychiatry, Annual Meeting

1995 - 2002 Consultant in Telemedicine (Psychiatry), Medical College of Georgia

1996 Consultant to National Institute for Health Care Research on "Model Curriculum for Psychiatry Residency Training Programs: Religion and Spirituality in Clinical Practice."

1996 - 1997 Consultant to National Institute for Health Care Research, Conference on Progress in Spiritual Research

1998 Consultant to State of Georgia, Department of Medical Assistance, Assessment of State Mental Health Clinics' Children's Services

2010 Consultant to Laity Lodge, San Antonio, Texas

### **AWARDS / HONORS**

1982 "Rookie-of-the-Year Award." Recognition of excellence in teaching by junior faculty, University of Minnesota

1989 "Excellence in Supervision." Award from child psychiatry fellows, Medical College of Georgia, Augusta, Georgia

1995 Distinguished Faculty Award for Clinical Science Teaching, School of Medicine, Medical College of Georgia

1997 Association for Academic Psychiatry, "Teacher of the Year Award" (Southern Region)

2001 Educational Excellence Award, Department of Psychiatry and Health Behavior, Medical College of Georgia

2004 Consultantship, George Washington University Institute for Spirituality and Health

2007 Presidential Achievement Award, Primary Author, Practice Parameter on Assessment of the Family American Academy of Child and Adolescent Psychiatry

2009 The Oates Award, in recognition of significant contributions to the field of pastoral care, awarded by the Wayne Oates Institute

2012 Gaines Professional Award, outstanding contribution to the mental health of Kentucky, Mental Health of America (Kentucky)

2015 Oskar Pfister Award for outstanding career contributions to the study of religion, spirituality and psychiatry, awarded by the American Psychiatric Association.

### **GRANTS / CONTRACTS**

1987 - 1989 (\$60,000/yr) Project Director, Training Contract, Gracewood State School & Hospital

1987 - 1998 (\$30,000/yr) Project Director, Training Contract, Sand Hills Psychoeducational Institute

1987 - 6/30/87 (\$76,000)	Project Director, Training Contract with Charter Hospital of Augusta
1987 - 1988 (\$235,000)	
1988 - 1991 (\$120,000/yr)	
1992 - 1994 (\$65,000/yr)	
1986 - 1997 (\$34-\$36,000/yr)	Project Director, Training Contract with Department of Juvenile Justice, State of Georgia
1998 - 1999 (\$36,000/yr)	
1999 - 2000 (\$85,000/yr)	
2000 - 2001 (\$170,000/yr)	
2001 – 2002 (\$450,000)	Project Director, Child and Adolescent Respond and Evaluate (CARE) Program in Child and Adolescent Crisis Services for Region 12 (State of Georgia Department of Mental Health)
2003-12 (\$150,000/yr., average award)	Project Director, Metro United Way of Louisville Grant to Bingham Child Guidance Center
2004-12 (\$70,000/yr)	Training contract with Our Lady of Peace Medical Center, Louisville, Kentucky
2005-12 (\$60,000/yr)	Training Grant with Kentucky Department of Juvenile Justice, Louisville, Kentucky
2003-12 (\$45,000/yr, average award)	WHAS Crusade for Children Health Care Grant, Louisville, Kentucky
2007-13 (\$110,000/yr)	Training Contract with Seven Counties Services, Louisville, Ky.

### **LEGAL FORENSIC RESUME**

Expert Witness/Consultation/Testimony in 52 cases: medical malpractice, custody, abuse, special education, adolescent pregnancy/family issues, criminal (loss of life/adolescent violence).

### **SCIENTIFIC AND PROFESSIONAL SOCIETIES**

#### **National:**

1982-2001	American Psychiatric Association
1982-2006	Royal College of Physicians and Surgeons (Canada) (Fellow)
1983-Present	American Academy of Child and Adolescent Psychiatry (Distinguished Fellow)
1983-Present	Association for Academic Psychiatry
1983-1989	American Scientific Affiliation
1985-1989	Society for Research in Child Development

1985-1998	American Orthopsychiatric Association
1985-present	American Medical Association
1986-2002	American Association of Directors of Psychiatric Residency Training
1989-Present	American Family Therapy Academy
1986-2002	Central Savannah River Area, Psychiatric Society
1986-1992	Georgia Psychiatric Association
1986-1992	Georgia Council on Child and Adolescent Psychiatry
2001-Present	American Psychiatric Association (Distinguished Life Fellow)
2003-Present	Jefferson County Medical Society
2003-Present	Christian Medical and Dental Association President, 2005-2008
2005-Present	American College of Psychiatrists
2007-Present	Group for the Advancement of Psychiatry (Committee on Family)

### **TEACHING (Current)**

"The Interactional Contribution to Child Development" to first and second year child psychiatry residents. This is a series of seminars discussing the role of family interaction in child development, part of a child development series.

Case Conference and selected lectures in child and adolescent psychiatry to psychiatry residents and child psychiatry residents.

Individual seminars on adolescence in "Growth, Development, and Psycho-pathology: A Contextual Approach" for first year child psychiatry residents.

Medical student lectures on "Normal Development and Child Psychopathology," "Family in Human Development and Medical Practice" and "Adolescent Disorders."

Family Therapy Seminar for second year child psychiatry residents.

Invited lectures to pediatric residents on family therapy, eating disorders and child development.



Coordinate Family and Couples Therapy for third year general residents

Coordinate Forensic and Administrative Seminar for Child and Adolescent Fellows

Directed Seminar at University of Louisville on "Spirituality and World View in Clinical Practice" for third year general psychiatry residents 2005-2007

Lecturer in University of Louisville School of Medicine series on "Religion, Spirituality, and Medicine" and "Medical Humanities"

Course Director, "At the Intersection of Religion and Medicine." Required course for second year medical students, University of Louisville School of Medicine.

## **PRESENTATIONS**

### **National / International:**

- March, 1982 "Psychiatry residents and the telephone: An analysis of usage patterns and recommendations for training". Association for Academic Psychiatry Annual Meeting, Bethesda, Maryland.
- September, 1982 "Developmental Issues in the Eating Disorders." Council for Children with Behavior Disorders Annual Meeting, Minneapolis, Minnesota.
- August, 1984 "The Developmental Problems of Christian Families". Second National Conference on the Church and Family, College of St. Thomas, Minneapolis, Minnesota.
- October, 1984 "The Role and Meaning of Dietary Manipulations in Families with a Hyperactive Child." American Academy of Child Psychiatry Annual Meeting, Toronto, Canada.
- October, 1984 "Attentional Changes in Children after Food Color Challenge." American Academy of Child Psychiatry Annual Meeting, Toronto, Canada.
- March, 1985 "Approaches to Teaching Development in Academic Psychiatry." Association for Academic Psychiatry Annual Meeting, Tampa, Florida.
- March, 1986 "The Use and Abuse of Humor in Teaching." Association for Academic Psychiatry Annual Meeting, Tucson, Arizona.
- March, 1986 "Surviving as a Child Psychiatry Educator: History and Current Trends." Co-presented with J. Forster, H. Gabriel, and M. Drell, Association for Academic Psychiatry Annual Meeting, Tucson, Arizona.
- October, 1986 "Variants of Individuation Failure: The Family's Role." Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Los Angeles, California.

- October, 1986 "Audiovisual Approaches in the Understanding of Child Development." Co-presented with D. Fidler and W. Erickson. Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Los Angeles, California.
- October, 1986 "The Adolescent in Family Therapy: Integrating Individual and Family Dynamics." Chair of Workshop, also co-presented with J. Frey, S. Xenakis, and C. Malone. Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Los Angeles, California.
- February, 1987 "Working with Families of Hyperactive Children." Georgia Psychiatric Association Annual Meeting, Atlanta, Georgia.
- March, 1987 Chairman, Symposium on "Gender Issues in Career Development and Psychiatry Education." Association for Academic Psychiatry Annual Meeting, Tampa, Florida.
- May, 1987 Course Director and Presenter, "Integrating Individual and Family Dynamics in the Treatment of Major Psychiatric Disorders." American Psychiatric Association, Annual Meeting, Chicago, Illinois.
- October, 1987 "The Family Therapy of Adolescent Narcissism." Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Washington, DC.
- January, 1988 "Teaching the Integration of Individual and Family Therapy." American Association of Directors of Psychiatric Residency Training Annual Meeting, New Orleans, LA.
- May, 1988 "Family Therapy and Adolescent Narcissistic Disorders." American Psychiatric Association Annual Meeting, Montreal, Canada.
- May, 1988 "Informed Content: Legal Consent Versus Therapeutic Process." American Psychiatric Association Annual Meeting, Montreal, Canada.
- May, 1988 "Family Dysfunction and the Attention Deficit Disordered Child." American Psychiatric Association Annual Meeting, Montreal, Canada.
- October, 1988 "When Self and System Collide: Ethics in Family Therapy." Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Seattle, Washington. (with P. Jensen)
- October, 1988 "Limit Setting in Family Therapy." Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Seattle, Washington.
- November, 1988 "A Religious Perspective on the Developmental Process." International Congress on Christian Counseling Annual Meeting, Atlanta, Georgia.

- November, 1988 "Sin or Psychopathology: An Analysis of Two Divergent Views." International Congress on Christian Counseling Annual Meeting, Atlanta, Georgia.
- November, 1988 "A Developmental Perspective on Abortion." International Congress on Christian Counseling Annual Meeting, Atlanta, Georgia.
- March, 1989 "The Developmental Model: An Aid to Ethical Decision Making in Family Therapy." Association for Academic Psychiatry Annual Meeting, Atlanta, Georgia.
- May, 1989 Chair, Symposium, "Gender and the Academic Life Cycle of Psychiatrists." American Psychiatric Association Annual Meeting, San Francisco, California.
- May, 1989 "Why Johnny Can't Sit Still: Kids Ideas of Why They Take Stimulants." (with P.S. Jensen and M.W. Bain.) American Psychiatric Association Annual Meeting, San Francisco, California.
- October, 1989 "Teaching the Integration of Individual and Family Therapy", In "Child Psychiatry Training: Curriculum Development and Program Evaluation". Annual Meeting of the American Academy of Child and Adolescent Psychiatry, New York, NY
- January, 1990 "Ethics and Family Therapy" (with A. Sondheimer, M.D.) American Association of Directors of Psychiatric Residency Training Annual Meeting, New Orleans.
- October, 1990 "Family Classification and Environmental Types: New Thoughts About Old Problems." (with P. Jensen, H. Davis, L. Blodeu, D. Smith.) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Chicago, Illinois.
- October, 1990 "Family Therapy of Children at Risk: Working with Character Disordered Parents." (with J. Connell, and J. Sargent) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Chicago, Illinois.
- October, 1990 "Teaching the Biopsychosocial Approach to the Severely Disturbed Child." (with M. Drell and R. Angell) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Chicago, Illinois
- March, 1991 "Psychiatric Residents as Teachers: Consultation to Non-Medical Professionals as a Training Experience." (with R. James) Association for Academic Psychiatry Annual Meeting, Tampa, Florida.
- May, 1991 "When World View of Patient and Psychotherapist Conflict." (with A. Nicholi, Jr., L. Bishop, R. Sider and I. Wiesner) American Psychiatric Association Annual Meeting, New Orleans, Louisiana.
- May, 1991 "Family Therapy and Personality Disordered Parents." (with J. Sargent) American Psychiatric Association Annual Meeting, New Orleans, Louisiana.

- October, 1991 "Relational Ethics and Child Treatment." (with L. Combrinck-Graham) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Francisco, California.
- October, 1991 "Integrating Family Concepts in the Teaching of Child Development." Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Francisco, California.
- October, 1991 "Family Therapy: Conceptual and Technical Approaches." (with M. Blotcky, J. Lewis, G.P. Sholevar, R. Stewart) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Francisco, California.
- October, 1991 "Ethics and the Practice of Child and Adolescent Psychiatry." (with A. Sondheimer, J. Sargent) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Francisco, California.
- October, 1991 "Academic Career Development in Child and Adolescent Psychiatry." (with J. Forster, M. Slonowitz, A. Unis, H. Wright) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Francisco, California.
- October, 1991 "The Difficult-to-Treat Adolescent: An Integrative Approach." (with J. Sargent, E. Beresin, S. Grater, A. Sondheimer) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Francisco, California.
- October, 1991 "State-University Collaboration in Child and Adolescent Psychiatry." (with D. Parmelee, H. Wright) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Francisco, California.
- October, 1991 "The AACAP Clinical Database Project: Methods, Implementation and Results." (with T. Anders, P. Jenson, B. Leventhal, L. Bloedau, B. Lee) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Francisco, California.
- January, 1992 "Non-Academic Challenges for Child Psychiatry Residents: The Resident and His Family." (with P. Holden, M. Drell, K. Matthews) American Association of Directors of Psychiatric Residency Training Annual Meeting, New Orleans, Louisiana.
- January, 1992 "Giving Talks to Non-Medical Audiences as a Training Experience." (with R.C. James) American Association of Directors of Psychiatric Residency Training Annual Meeting, New Orleans, Louisiana.
- May, 1992 "Alcohol and the Family: The Party's Over." Symposium discussant, American Psychiatric Association Annual Meeting, Washington, D.C.
- October, 1992 "State University Collaboration Issues in Child and Adolescent Psychiatry." (with

H. Wright and D. Parmelee) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Washington, D.C.

- October, 1992 "Ethics, the Family, and Child and Adolescent Psychiatry Practice." (with A. Sondheim and J. Sargent) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Washington, D.C.
- October, 1992 "The Difficult to Treat Adolescent: An Integrative Approach." (with J. Sargent, A. Sondheim, and E. Beresin) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Washington, D.C.
- November, 1992 "A Proposal Framework for Making Value Judgments in Psychotherapy." (with C. Cottle, R. Bagge) Second International Congress on Christian Counseling, Atlanta, Georgia.
- November, 1992 "Theological Perspectives on the Developmental Process: A Child Psychiatrist's Perspective." Second International Congress on Christian Counseling, Atlanta, Georgia.
- May, 1993 "The Psychiatrist's World View and Clinical Models." American Psychiatric Association Annual Meeting, San Francisco, California.
- May, 1993 "When A Child Dies: The Impact of the Parents' World View." American Psychiatric Association Annual Meeting, San Francisco, California.
- October, 1993 "The Difficult to Treat Adolescent: An Integrative Approach." (with J. Sargent, A. Sondheim, G. Beresin) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Antonio, Texas.
- March, 1994 "The Politically Correct Psychiatrist: How Do We Promote Patient Autonomy and Responsibility When Everyone Is a Victim?" (with D. Misch) Association For Academic Psychiatry Annual Meeting, Tucson, Arizona.
- May, 1994 "The Exploration of World Views in Psychotherapy," Course Director, American Psychiatric Association Annual Meeting, Philadelphia, Pennsylvania.
- October, 1994 "Family Therapies: Integration with Other Treatment Modalities in the Treatment of the Seriously Disturbed Adolescents." Annual Meeting of the American Academy of Child and Adolescent Psychiatry, New York City, New York.
- May, 1995 "The Exploration of World Views in Psychotherapy," Course Director, American Psychiatric Association Annual Meeting, Miami, FL.
- October, 1995 "Multimodal Treatment of Disturbed Adolescents." (with J. Sargent, A. Sondheim, G. Beresin) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, New Orleans.

- March, 1996 "Myths About the Biopsychosocial Model." Association for Academic Psychiatry Annual Meeting, Tampa, Florida.
- March, 1997 "Teaching Minority Issues in Psychiatry Residency." (With R. Burket and B. Simpson) Southern Group on Educational Affairs Annual Meeting, Augusta, Georgia.
- May, 2000 "Clinical Models and a Religious/Spiritual World View: Toward a Rapprochement". American Psychiatric Association Annual Meeting, Chicago, Illinois.
- May, 2000 "World Views and the Doctor Patient Relationship". Symposium Chair, American Psychiatric Association Annual Meeting, Chicago, Illinois.
- July, 2000 "Raising Children in Foreign Cultures: Implications for Child and Adolescent Development." South Indian Ocean Missionaries and Educators Annual Conference, Reunion Island, France.
- October, 2000 "Do Families Cause, or Respond to, Psychopathology?" Association for Academic Psychiatry Annual Meeting, Vancouver, B.C., Canada.
- March, 2001 "Guidelines on Determining the Family's Role in Psychopathology: Implications for Psychiatric Residency Training." American Directors of Psychiatric Residency Training Annual Meeting, Seattle, Washington.
- March, 2001 "Ten Myths About the Biopsychosocial Model." Annual Meeting of the Society of Professors of Child and Adolescent Psychiatry, Key Largo, Florida.
- May, 2001 "Beyond Mind and Brain: Considering the Patient's World View." Symposium Chair, American Psychiatric Association Annual Meeting, New Orleans, Louisiana.
- May, 2001 "Clinical Psychiatry and Spirituality: Another Level of Integration." American Psychiatric Association Annual Meeting, New Orleans, Louisiana.
- October, 2001 "The Clinical Process of Sequencing Psychotherapeutic Treatments," Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Honolulu, Hawaii.
- March, 2002 "Becoming an Administrative Chief: Observations on Leading a Child Psychiatry Division," Annual Meeting of the Society of Professors of Child and Adolescent Psychiatry, Hollywood, Florida.
- October 2002 "Religion and Spirituality in Child and Adolescent Treatment", Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Francisco, California.

- October 2002 “Gay and Lesbian Parenting: Emerging Issues”, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Francisco, Ca.
- March, 2003 “What Does A New Division Chief Need To Learn”, Annual Meeting of the Society of Professors of Child and Adolescent Psychiatry, Santa Fe, New Mexico.
- October, 2003 “Genetics and The Environment: Clinical Perspectives.” (Symposium discussant). Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Miami, Florida.
- March 2004 “What Does a New Division Chief Need to Learn”. Annual Meeting of the Society of Professors of Child and Adolescent Psychiatry, San Juan, Puerto Rico.
- May, 2004 “Controversies at the Interface Between Religion and Psychiatric Practice”. Workshop Chair, Annual Meeting of the American Psychiatric Association, New York, New York.
- May, 2004 “Religion, Spirituality and Psychiatric Practice at the University of Louisville”, Annual Meeting of the American Psychiatric Association, New York, New York.
- March 2005 “Going from ‘Good to Great’: Helping Child Psychiatry Divisions Take the Next Step Forward”, Annual Meeting of the Society of Professors of Child and Adolescent Psychiatry, Washington, D.C.
- May 2005 “World Views in Psychiatry: Approaches to Clinical Care”, (with J. Peteet and M.L.Dell), Annual Meeting of the American Psychiatric Association, Atlanta, Georgia.
- May 2005 “Neutrality Revisited: Is Autonomy What We Most Want?” Workshop (with Thielman, SB, Bishop, LB and Peteet, JR) American Psychiatric Association Annual Meeting, May
- October 2005 “Master Clinician”, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Toronto, Canada.
- October 2005 “Family Assessment Parameter: A Guide to Clinical Practice”, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Toronto, Canada.
- April 2006, 2007, 2008, 2009  
2012, 2013 “What Does A Division Director Need to Know?” (with M. Drell) Annual Meeting of the Society of Professors of Child and Adolescent Psychiatry, Washington, D.C.
- May 2006 “Curricula in Spirituality and Psychiatry”, Symposium Discussant, Annual Meeting of the American Psychiatric Association, Toronto, Canada
- May 2006 “Can We Talk? A Model for Constructive Conversation between Opponents and

Advocates of Same Sex Relationships toward a Dialogue on Homosexual Marriage”. (With J Drescher, J Peteet, P. Feeley and C. Ambridge). Annual Meeting of the American Psychiatric Association, Toronto, Canada.

May 2006

“Worldview and Spirituality in Clinical Practice”, Course Director, Annual Meeting of the American Psychiatric Association, Toronto, Canada.

May 2006

“Religious and Spiritual Aspects of Child and Adolescent Psychiatric Disorders”, (with ML Dell). In symposium “A Research Agenda for DSM V Concerning Religious and Spiritual Issues in the Diagnostic Process”. Annual Meeting of the American Psychiatric Association, Toronto, Canada.

October 2006

“Master Clinician”, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Diego, California.

October 2006

“New Perspectives on Family Assessment”, Chair, Special Interest Group, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Diego California.

October 2006

“Failure: Recognizing, Accepting and Learning from Failures in Treatment” (with S Copans et al) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Diego, California.

October 2006

“Psychosocial Research in ADHD”, Discussant, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Diego, California.

May 2007

“Worldview and Spirituality in Clinical Practice”, Course Director, Annual Meeting of the American Psychiatric Association, San Diego, California.

October 2007

“Master Clinician”, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Boston, Massachusetts.

October 2007

“Family Treatments and Epidemiology”, Maintenance of Certification Institute, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Boston, Massachusetts.

October 2007

“Catatonia in a Four Year Old Girl”, Case Conference Discussant, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Boston, Massachusetts.

May 2008

“Worldview and Spirituality in Clinical Practice”, Course Director, Annual Meeting of the American Psychiatric Association, Washington, D.C.

October 2008

“Master Clinician”, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Chicago, Illinois.

October 2008

“Limit Setting in Clinical Practice: Effective Strategies to Empower Parents”, Annual Meeting of the American Academy of Child and Adolescent Psychiatry,



Chicago, Illinois.

- October 2008 “Long Term Treatment of Psychosis in Young Children”. Clinical Case Conference with S. Mason, M. Benoit, P. Joshi and N. Gogtay. Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Chicago, Illinois.
- October 2008 “Religion and Spirituality in Clinical Practice”. Co-Chair (with M L. Dell). Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Chicago, Illinois.
- May 2009 “From Development to DSM: Can our Teaching Bridge the Gap?” Annual Meeting of the Society of Professors of Child and Adolescent Psychiatry, Washington D.C.
- October 2009 “Master Clinician”, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Honolulu, Hawaii.
- October 2010 “Limit Setting in Clinical Practice: Effective Strategies to Empower Parents”. Chair, Co-presented with S. Copans and P.A. Mabe, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, New York, New York.
- October 2010 “Religion and Spirituality in Child and Adolescent Psychiatric Practice”. Chair of Institute, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, New York, New York.
- October 2010 “Religion and Spirituality in Child and Adolescent Psychiatry: A New Frontier”. Annual Meeting of the American Academy of Child and Adolescent Psychiatry, New York, New York.
- October 2010 “Integrating Religious and Spiritual Issues in the Treatment of Children, Adolescents, and Families.” Annual Meeting of the American Academy of Child and Adolescent Psychiatry, New York, New York.
- October 2010 “When the Diagnosis is Bipolar: Are There Other Explanations?” (Chair) Annual Meeting of the American Academy of Child and Adolescent Psychiatry, New York, New York.
- October 2010 “The Family’s Role in Self Regulation: Developing the Ability to “Stop”. Annual Meeting of the American Academy of Child and Adolescent Psychiatry, New York, New York.
- November 2011 “Families and Depression” with B. Beardslee and E. Berman, Annual Meeting of the National Network of Depression Centers, Baltimore, Maryland.
- April 2013 “Why the Family is Relevant for the Contemporary Psychiatrist.” Group for the Advancement of Psychiatry, White Plains, New York.
- May 2014 “Lessons Learned from a Departmental Crisis: Moving a Child Psychiatry

Division into a Department of Pediatrics”, Annual Meeting of the Society of Professors of Child and Adolescent Psychiatry, Washington, D.C.

- October 2014 Anxiety and Autism: Family Perspectives. Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Diego, California.
- October 2014 Reinventing Family Therapy: Toward Family Intervention, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Diego, California.
- October 2014 From Family Therapy to Family Intervention: The Next Paradigm, Annual Meeting of the American Academy of Child and Adolescent Psychiatry, San Diego, California.

## **PRESENTATIONS**

### **Invited Lectureships:**

- September, 1987 "The Family Therapy of Adolescent Narcissism." Grand Rounds presented to the University of Minnesota, St. Paul Ramsey Medical Center, St. Paul, Minnesota.
- June, 1989 "The Self in the System: Toward the Integration of Individual and Family Therapy." Grand Rounds, Pine Rest Christian Hospital, Teaching Hospital of Michigan State University, Grand Rapids, Michigan.
- April, 1990 "Integration of Individual and Family Therapy", Grand Rounds, Department of Psychiatry, Loma Linda University, Loma Linda, California.
- October, 1990 "An Interactional Perspective on Adolescent Narcissistic Disorder", Grand Rounds, Department of Psychiatry, University of South Carolina, Columbia, South Carolina.
- January, 1995 "The Integration of Individual and Family Therapy," University of Pennsylvania, Philadelphia Child Guidance Clinic, Philadelphia, Pennsylvania.
- November, 1996 "Ten Myths About Family Therapy," Grand Rounds, New Jersey Medical School, Newark, New Jersey.
- February, 1997 "Ten Myths About Family Therapy," Grand Rounds, Mayo Medical School, Rochester, Minnesota.
- September, 1997 "Contemporary Perspectives on Child and Adolescent Psychiatry," Menninger Clinic, Topeka, Kansas.
- September, 1999 "Family Therapy in an Era of Biologic Psychiatry," Emory University, Atlanta, Georgia.

- May, 2001 “Family Therapy in an Era of Biologic Psychiatry,” Cleveland Clinic, Cleveland, Ohio.
- August 2005 “Family Based Treatment Research”, Presented at the American Medical Association National Media Briefing , New York, New York.
- March 2007 “Dealing with Worldview and Spirituality in Clinical Practice”, University of Puerto Rico, San Juan Puerto Rico.
- October 2007 “Diagnosis in Contemporary Psychiatry: What’s in a Name” University of North Carolina, Chapel Hill, North Carolina.
- March 2008 “Spirituality and Religion in the Clinical Worlds of Patients and Families”, University of Washington, Seattle. Children’s Hospital, Seattle, Washington.
- August 2008 “Treating the Troubled Mind: Religious and Spiritual Perspectives”. Annual Meeting of the Georgia Psychiatric Physicians’ Association, Amelia Island, Florida.
- September 2008 “World View and Spirituality in Clinical Practice”. University of California at Davis, Sacramento, California.
- April 2009 “World View and Spirituality in Clinical Practice”, Loma Linda University, Loma Linda, California.
- April 2009 “Holistic Treatment of Adolescent Bipolar Disorder”, St. Mary’s Medical Center, Evansville, Indiana.
- January 2010 “Worldview and Spirituality in Psychiatric Practice”, Virginia Tech School of Medicine/Carilion Clinic, Roanoke, Virginia.
- May 2011 When the Diagnosis is Bipolar: The Family’s Role in Self Regulation, Harvard Medical School/Boston Children’s Hospital.
- September 2011 Brewster Lecture, When the Diagnosis is Bipolar: The Family’s Role in Self Regulation, University of Colorado School of Medicine.
- September 2011 Worldview and Spirituality: Child, Adolescent and Family Perspectives, University of Colorado School of Medicine.
- September 2011 When the Diagnosis is Bipolar: The Family’s Role in Self Regulation, University of Kentucky School of Medicine.
- March 2013 When the Diagnosis is Bipolar: The Family’s Role in Self Regulation, Emma Pendleton Bradley, Brown University.
- March 2013 Why the Family is Relevant for the Contemporary Psychiatrist. Position Statement presented at the Plenary of the Group for Advancement of Psychiatry,

White Plains, New York.

- December 2013 When the Diagnosis is Bipolar: The Family's Role in Self Regulation, University of Texas (San Antonio).
- May 2014 The Family in Mental Health: Enduring Constants, Emerging Realities, University of Kentucky, Lexington, Kentucky.

## **PRESENTATIONS**

### **Regional:**

- June, 1981 "Relationships between Food and Behavior" to the "Nutritional Support in Development Disabilities" Conference, Sister Kenny Institute, Minneapolis, Minnesota.
- October, 1982 "The Psychodynamics of Eating Disorders" at the "Eating and Disorders Update" Conference, University of Minnesota, Minneapolis, Minnesota.
- November, 1982 "A Contemporary Psychiatric View of the Mind - Brain Problem" at the McLaurin Institute for Interdisciplinary Studies, Minneapolis, Minnesota.
- March, 1984 "Borderline Personality: Diagnosis and Management", Northland Mental Health Center, Grand Rapids, Minnesota.
- September, 1984 "Family Dysfunction and the Eating Disorders", Central Mesabi Medical Center, Hibbing, Minnesota.
- January, 1986 "Hyperactive Behaviors, Diets, and Families", Grand Rounds, Department of Psychiatry, Medical College of Georgia, Augusta, Georgia.
- July, 1986 "Emotional Development: Theological Implications", Georgia Regional Hospital, Atlanta, Georgia.
- May, 1986 "Alcohol Use and Associated Family System Dysfunction", Georgia Episcopal Diocese, Augusta, Georgia.
- September, 1986 "The Developmental Cycle of Families". Presented to Georgia Regional Hospital, Social Service Department, Augusta, Georgia.
- October, 1986 "Psychiatric Symptoms and Their Relationship to Family Dysfunction." Presented to Georgia Regional Hospital Social Service Department, Augusta, Georgia.
- January, 1987 "Managing Conduct Disorders in School Settings", Richmond County Special Education Conference, Augusta, Georgia.

- February, 1987 "Variants of Adolescent Individuation Failure." Grand Rounds, Department of Psychiatry, Medical College of Georgia, Augusta, Georgia.
- February, 1987 "The Severe Character Disorder in the Public Mental Health Setting." Presented at "A Public Health Symposium on the Major Psychiatric Illnesses," Augusta, Georgia.
- May, 1987 Chair, "Working With Families in Crisis," sponsored by Charter Hospital of Augusta and the Department of Psychiatry and Health Behavior of the Medical College of Georgia, Augusta, Georgia.
- May, 1988 Chair, "Parenting the Behavior Disordered Child," sponsored by Charter Hospital of Augusta and the Department of Psychiatry and Health Behavior of the Medical College of Georgia, Augusta, Georgia.
- May, 1988 "Self in the System: Toward the Integration of Individual and Family Therapy." Grand Rounds, Department of Psychiatry, Medical College of Georgia, Augusta, Georgia.
- February, 1990 "Epidemiology of Adolescent Narcissistic Disorder in Adolescent Psychiatric Inpatients", Grand Rounds, Department of Psychiatry, Medical College of Georgia, Augusta, Georgia.
- February, 1991 "Narcissistic Adolescents and Their Families", Charter Hospital of Augusta, Georgia.
- April, 1991 "Psychopharmacology Review in Child Psychiatry", Continuing Medical Education Symposium, Medical College of Georgia, Augusta, Georgia.
- June, 1991 "Inpatient Child and Adolescent Psychiatry", Continuing Medical Education Symposium, Medical College of Georgia, Augusta, Georgia.
- September, 1991 "Integration of Individual and Family Therapy in the Treatment of Adolescent Disorders", Charter Hospital, St. Simon's Island, Georgia.
- February, 1992 "Update in Adolescent Psychiatry", Chair, Medical College of Georgia, Continuing Medical Education, Augusta, Georgia.
- April, 1992 "Integration of Individual and Family Therapy in the Treatment of Child and Adolescent Disorders", Grand Rounds, Department of Psychiatry, Medical College of Georgia, Augusta, Georgia.
- October, 1992 "Clinical Features of Tic Disorders in Children and Adolescents", (with M. McSwiggan-Hardin and P. Hartlage) Georgia Chapter of American Academy of Pediatrics, Atlanta, Georgia.
- November, 1992 "Family Issues: Severe Tourette's Syndrome and Services Home and School Problems", (with M. McSwiggan-Hardin) Regional Symposium of Tourette

Syndrome Association of Georgia, Atlanta, Georgia.

- June, 1994 "Violence in Children, Adolescents and Families", Chair, Medical College of Georgia, Continuing Medical Education, Augusta, Georgia.
- November, 1998 "Children and Acute Hospitalization", Medical College of Georgia, Children's Medical Center, Continuing Medical Education, Augusta, Georgia.
- February, 2000 "Family Interventions with Tyrannical Adolescents", Annual Meeting of the Georgia Psychiatric Physician's Association.
- June, 2000 "Child and Adolescent Depression: An Update", Annual Meeting Georgia Academy of Pediatrics, Sea Island, Georgia.
- January/February 2001 "Suicide in Delinquent Youth: Diagnostic and Treatment Issues", Department of Juvenile Justice, State of Georgia, Forsythe, Georgia (with A. Mabe, Ph.D.)
- March, 2003 "An Integrated Approach to the Use of Pharmacotherapy in the Treatment of Child and Adolescent Disorders", Annual Meeting of the Kentucky Psychiatric Association, Louisville, Kentucky.
- October 2006 "Child and Adolescent Depression", NAMI sponsored conference for Mental Health Awareness Week, Louisville Kentucky.
- February 2006 "An Update on Family Treatments", Annual Meeting of the American Association of Family Therapy (Kentucky Chapter).
- November 2007 "Diagnosis in Child and Adolescent Psychiatry: What is In a Name?", Keynote Address, Pediatric Care Forum, Louisville, Kentucky, Sponsored by U of L Healthcare and Passport Health Plan.
- March 2008 "Diagnosis in Child and Adolescent Psychiatry: What is In a Name?" Grand Rounds, University of Louisville Department of Pediatrics, Louisville, Kentucky.
- October 2008 "Spirituality and Depression: Making Sense of the Relationship", Second Annual University of Louisville Depression Conference, Louisville, Kentucky.
- October 2009 "Bipolar Disorder in Children and Adolescents: A Reappraisal", Seventeenth Annual Pediatric Symposium, Department of Pediatrics, University of Louisville.
- February 2011 "What's Worldview Got to do With It?" Plenary address at the University of Louisville School of Medicine, Wellness Day.
- August 2011 "Children's Mental Health Treatment: Best Diagnosis for Best Care", Mental Health Symposium, Kentucky Academy of Pediatrics and American Academy of Pediatrics, Barren River, Kentucky.

- September 2011 “Building Hope in Depression: The Role of Religion and Spirituality”, University of Louisville Depression Center, Louisville Kentucky.
- March 2012 “The Myth of the Bipolar Syndrome.” Plenary Address at “Faces of Childhood Trauma” Symposium, sponsored by Kent School of Social Work, Jefferson County Circuit Court (Family Division) and East End Psychological Associates.
- November 2013 “The Family in Mental Health: Enduring Constants, Emerging Realities.” Plenary address of the 100<sup>th</sup> Anniversary of the Bingham Clinic Symposium, Louisville.
- September 2014 The Myth of the Bipolar Syndrome, Third Annual Mental Health Forum, University of Louisville, Department of Pediatrics.

### **AUDIOVISUAL PROGRAMS**

- September, 1981 "The Development of Personality." Produced by University of Minnesota Media Resources. Three hours of demonstration of normal child development. Review: H.J. Lurie, Hospital and Community Psychiatry, 1991, 42(1), p. 21.

### **PUBLICATIONS**

#### **ABSTRACTS**

- Josephson AM, MacKenzie TB. (Dec 1980) Thyroid-Induced mania in hypothyroid patients. *Digest of Neurology and Psychiatry* p. 452.
- Josephson A.M, MacKenzie TB (Mar 1981) Thyroid-Induced mania in hypothyroid patients. *Psychiatry Digest* pp.6-7.
- Josephson AM, Frey J, Xenaxis S, Malone C. (1986) The Adolescent in family therapy: Integrating individual and family dynamics. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 2, 45.
- Josephson AM, Fidler D, Erickson W. (1986) Audiovisual approaches in the understanding of child development. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 2, 45.
- Josephson AM, Thompson M. (1987) The family therapy of adolescent narcissism: Controlling behavior and developing empathy. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 3, 19-20.
- Josephson AM. (1988) Integrating individual and family therapy. *American Association of Directors of Psychiatric Residency Training Workshop Supplement* 16(2), 5-6.
- Josephson AM, Jensen P. (1988) When self and system collide: Ethics in family therapy. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 4, 25.
- Chowanec G, Josephson A, Coleman C. (1989) Self harming behavior in incarcerated male delinquent

adolescents. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 5, 81.

Wright H, Josephson AM, Parmelle D. (1991) State-University collaboration in child and adolescent psychiatry. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 7, 24.

Josephson AM. (1991) Alternative pathways to academic career development. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 7, 36.

Sondheimer A, Sargent J, Josephson AM. (1991) Ethics and the practice of child and adolescent psychiatry. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 7, 20.

Anders T, Jensen P, Leventhal B, Bloedau L, Josephson A, Lee B, Traylor J. (1991) The AACAP data base project: Methods, implementation and results. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 7, 24.

Sargent J, Beresin E, Josephson A, Sondheimer A. (1992) The difficult to treat adolescent: An integrated approach. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 8, 22.

Wright H, Josephson A, Parmellee D. (1992) State-University collaboration issues in child and adolescent psychiatry. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 8, 20.

Sondheimer A, Sargent J, Josephson A. (1992) Ethics, the family and child and adolescent psychiatry practice. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 8, 21.

Sargent J, Sondheimer A, Beresin E, Josephson A. (1993) The difficult to treat adolescent: An integrative approach. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 9, 20-21.

Misch D, Josephson A. (1994) The politically correct psychiatrist: How do we promote patient autonomy and responsibility when everyone is a victim. *Bulletin of the Association for Academic Psychiatry* 22(1), 7.

Sargent J, Sondheimer A, Beresin E, Josephson A. (1994) Integrating treatment modalities for seriously disturbed adolescents: indications, methods, pitfalls. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 10, 16.

Josephson AM. (1995) Creating and maintaining excellent clinical rotations. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 11, 3.

Sargent J, Beresin E, Josephson A, Sondheimer A. (1995) Integrating treatment modalities for seriously disturbed adolescents: indications, methods and pitfalls. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 11, 31.



Josephson AM. (1996) Family assessment: utilizing historical and observational approaches. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 12, 9.

Josephson AM, Black J. (1996) Family therapy of adolescent narcissism: Controlling behavior and developing empathy. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 12, 28.

Mabe PA, Josephson A. (1997) Back to basics: Parent management training. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 13,26.

Drell MJ, Josephson A, Hendren R, Sexson, S. (1997) Administrative skills for the child and adolescent psychiatrist. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 13, 29.

Josephson AM. (1997) Family therapy of adolescent narcissism: Advanced workshop controlling behavior and developing empathy. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 13, 31.

Mabe PA, Josephson A. (1998) Back to basics: Parent management training. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 14, 30.

Josephson AM. (1998) Family therapy of adolescent narcissism: Advanced workshop controlling behavior and developing empathy. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 14, 33.

Josephson AM. (1998) The nuts and bolts of recruiting, *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 14, 32.

Mabe PA, Josephson A. (1999) Back to basics: Parent management training. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 15, 24.

Josephson AM. (1999) Change, cataclysmic change and chronic change: Implications for administrators. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 15, 26.

Josephson AM. (2000) Working with families in an age of biological psychiatry. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 16, 25.

Josephson AM. (2001) The clinical process of sequencing therapies: When, what, how. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 17, 14.

Bussing R, dosReis S, Palinkas L, Zima B, Josephson A. (2006) Optimizing ADHD treatment: Family focused approaches to improve family engagement. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 22, 83-85.

Josephson AM. (2007) Epidemiology, family treatment, and research update. *Scientific Proceedings of the Annual Meeting of the American Academy of Child and Adolescent Psychiatry* 23,19.

## JOURNALS

Josephson, A.M., & MacKenzie, T.B.: Manic psychosis after rapid normalization of thyroid status. *American Journal of Psychiatry*, 1979, 136:846-847.

Josephson, A.M., & MacKenzie, T.B.: Thyrotoxicosis and mania. (letter), *American Journal of Psychiatry*, 1980, 137:262-263.

Josephson, A.M., & MacKenzie, T.B.: Thyroid induced mania in hypothyroid patients. *British Journal of Psychiatry*, 1980, 137:222-228.

Jensen, P.S., Josephson, A.M., Frey, J.: Informed consent: Legal content versus therapeutic process. *American Journal of Psychotherapy*, 1989, 93:378-386.

Chowanec, G.C., Josephson, A.M., Coleman, C., Davis, H.: Self harming in incarcerated male delinquents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 1991, 30:202-207.

Josephson, A.M., Erickson, W.D.: The effect of paternal Huntington's Disease on male adolescents. *Adolescent Psychiatry*, 1992, 18:306-321.

Josephson, A.M., Drell, M.: Didactic modules for curricular development in child and adolescent psychiatry. *Academic Psychiatry*, 1992, 16:44-51.

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7-2015

**UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF NORTH CAROLINA**

JOAQUÍN CARCAÑO *et al.*,

Plaintiffs,

v.

PATRICK MCCRORY *et al.*,

Defendants

CASE NO. 1:16-CV-00236-TDS-JEP

UNITED STATES OF AMERICA,

Plaintiff,

v.

STATE OF NORTH CAROLINA *et al.*,

Defendants

CASE NO. 1:16-CV-00425-TDS-JEP

**DECLARATION OF LAWRENCE S. MAYER, MD, MS, PhD**

1. I have been retained by counsel for Defendants as an expert witness in connection with the above-captioned litigation.

2. I am a full-time academic involved in all aspects of teaching, research, and professional service. I am a medically trained biostatistician and epidemiologist who focuses on the design, analysis, and interpretation of experimental and observational data in public health and medicine, particularly when the data are complex in terms of underlying medical and scientific issues. I trained in medicine and psychiatry abroad, receiving a first level medical degree (M.B., the British Equivalent of an M.D.) in the United Kingdom. I then studied psychiatry and epidemiology before returning to the states to obtain an MS and

EXHIBIT 4



PhD in mathematics and statistics. I have never practiced psychiatry or clinical medicine and will not testify about any clinical issues. A copy of my CV is attached as Exhibit A.

3. My opinions as detailed in this declaration are based upon my knowledge and direct professional experience in the subject matters discussed. The materials that I have relied upon are the same types of materials that other experts in my field rely upon when forming opinions on the subject. A list of references and footnotes is included at the end of this declaration.

4. I have been a full-time tenured Professor for over four decades. I have held professorial appointments at nine universities including Princeton, the University of Pennsylvania, Stanford, Arizona State University, Johns Hopkins (Bloomberg School of Public Health and School of Medicine), The Ohio State University, Virginia Tech, University of Arizona, and the University of Michigan. I have held research faculty appointments at the Mayo Clinic, the Banner Alzheimer's Institute, and a senior management appointment (Director of Research) for Banner Health System, one of the largest hospital systems in the Western United States.

5. My full-time and part-time appointments have been in 23 disciplines or subdisciplines including, statistics, biostatistics, epidemiology, public health, social methodology, psychiatry, economics and biomedical informatics.

6. I have done extensive investigation into the existing research and epidemiological data on the transgender population.

7. Although I am a full-time academic researcher, over the last 40 years, I have testified in dozens of federal and state legal proceedings and regulatory proceedings. Most of them involved review of scientific literature in order to clarify the issues under examination in the

process. A list of my testimony is attached as Exhibit B.

8. I have also reviewed, as a methodologist hundreds of manuscripts submitted for publication to many of the major medical, statistical and epidemiological journals including *The New England Journal of Medicine* and *The Journal of the American Statistical Association*.

9. I am currently a Scholar in Residence, Department of Psychiatry, Johns Hopkins School of Medicine and a Professor of Statistics and Biostatistics, Arizona State University.

10. Up until the 1<sup>st</sup> of July, 2016, I also held part-time faculty appointments at the Johns Hopkins Bloomberg School of Public Health and School of Medicine, and at the Mayo Clinic, Scottsdale.

11. I may wish to supplement these opinions or the bases for them as a result of new scientific research or publications or in response to statements and issues that may arise in my area of expertise.

12. I am compensated at an hourly rate of \$400 per hour. My compensation does not depend on the outcome of this litigation, the opinions I express, or the testimony I provide.

### **Summary Opinions**

13. The concept of biological sex is well defined, based on the binary roles that males and females play in reproduction. By contrast, the concept of gender is not well defined. It is generally taken to refer to behaviors and psychological attributes that tend to be typical of a given sex. Some individuals identify as a gender that does not correspond to their biological sex. The causes of this identification remain poorly understood.

14. Research investigating whether these transgender individuals have certain physiological features or biological traits or experiences in common with the opposite sex,

such as brain structures or atypical prenatal hormone exposures, has so far been inconclusive.

15. Gender dysphoria—a sense of incongruence between one’s biological sex and one’s gender, accompanied by clinically significant distress or impairment.

16. Gender dysphoria is sometimes treated in adults by hormones or sex-reassignment surgery. There is little scientific evidence that these therapeutic interventions have psychological benefits and acceptable risks.

17. Science has shown that gender identity issues in children, if not encouraged (or even pressured) to change their gender, usually do not persist into adolescence or adulthood, and there is little scientific evidence for the therapeutic value of puberty-delaying pharmacologic treatments.

18. I am concerned about the lack of scientific support for the increasing trend toward encouraging children with gender identity issues to transition to expressing their gender through medical and then surgical procedures.

**“Sex,” “Gender,” and “Gender Identity”**

19. There seems to be a widely held popular belief that “gender identity”—the subjective, internal sense of being a man or a woman (or some other gender category)—is fixed at a very early age, or even at birth, and can diverge from a person’s biological sex. In the case of children, this is sometimes articulated by saying that a little boy may be trapped in a little girl’s body, or vice versa.

20. There is little scientific evidence that gender identity is fixed at an early age and none that it is present at birth. It is highly unlikely that newborns have any sense of themselves, let alone a sense of gender.

21. Though biological sex is fixed, and gender and biological sex are related in complex ways, they are not identical; gender is sometimes defined or expressed in ways that have little or nothing to do with biology.

22. To clarify what is meant by “gender” and “sex,” I refer to a widely used definition, here quoted from a pamphlet published by the American Psychological Association (APA):

*Sex* is assigned at birth, refers to one’s biological status as either male or female, and is associated primarily with physical attributes such as chromosomes, hormone prevalence, and external and internal anatomy. *Gender* refers to the socially constructed roles, behaviors, activities, and attributes that a given society considers appropriate for boys and men or girls and women. These influence the ways that people act, interact, and feel about themselves. While aspects of biological sex are similar across different cultures, aspects of gender may differ.<sup>1</sup>

This definition points to the obvious fact that there are social norms for men and women, norms that vary across different cultures and that are not simply determined by biology. But it goes further in holding that gender is almost entirely “socially constructed”, and thus, detached from biological sex.

23. In biology, an organism is male or female if it is structured to perform one of the respective roles in reproduction. This definition does not require any arbitrary measurable or quantifiable physical characteristics or behaviors; it requires understanding the reproductive system and the reproduction process. Different animals have different reproductive systems, but sexual reproduction occurs when the sex cells from the male and female of the species come together to form newly fertilized embryos. It is these reproductive roles that provide the conceptual basis for the differentiation of animals into the biological categories of male and female.

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<sup>1</sup> American Psychological Association, “Answers to Your Questions About Transgender People, Gender Identity and Gender Expression” (pamphlet), <http://www.apa.org/topics/lgbt/transgender.pdf>.

24. In mammals such as humans, the female gestates offspring and the male impregnates the female. More universally, the male of the species fertilizes the egg cells provided by the female of the species. This conceptual basis for sex roles is binary and stable, and allows us to distinguish males from females on the grounds of their reproductive systems, even when these individuals exhibit behaviors that are not typical of males or females.

25. Reproductive roles define the differences between the sexes even when behavior appears to be atypical for the particular sex. Consider, for example, the emperor penguin. Male emperor penguins provide warmth for eggs and nurturing of the young more than do females. In this sense, the male emperor penguin could be described as more maternal than the female.<sup>2</sup> However, we recognize that the male emperor penguin is not in fact female but rather that the species represents an exception to the general, but not universal, tendency among animals for females to provide more care than males for offspring. We recognize this because sex-typical behaviors such as nurturing do not define the sexes; the individual's role in sexual reproduction does.

26. Another example is that of Thomas Beatie, who made headlines as a man who gave live birth to three children between 2008 and 2010.<sup>3</sup> Thomas Beatie was born a woman, Tracy Lehuanani LaGondino, and underwent a surgical and legal transition to living as a man before deciding to have children. Because the medical procedures he underwent did not involve the removal of his ovaries or uterus, Beatie was capable of bearing children. The state of Arizona recognizes Thomas Beatie as the father of his three children, even though,

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<sup>2</sup> André Ancel, Michaël Beaulieu, and Caroline Gilbert, "The different breeding strategies of penguins: a review," *Comptes Rendus Biologies* 336, no. 1 (2013): 6–7, <http://dx.doi.org/10.1016/j.crvi.2013.02.002>. Generally, male emperor penguins do the work of incubating the eggs and then caring for the chicks for several days after hatching. After that point, males and females take turns caring for the chicks.

<sup>3</sup> For an overview of Thomas Beatie's story, see his book, *Labor of Love: The Story of One Man's Extraordinary Pregnancy* (Berkeley: Seal Press, 2008).

biologically, he is their mother. Unlike the case of the male emperor penguin's ostensibly maternal, "feminine" parenting behavior, Beatie's ability to have children does not represent an exception to the normal inability of males to bear children. The labeling of Beatie as a man despite his being biologically female is a personal, social, and legal decision that was made without any basis in biology; nothing whatsoever in biology suggests Thomas Beatie is a male.

27. Scientifically speaking, transgender men are not biological men and transgender women are not biological women. The claims to the contrary are not supported by a scintilla of scientific evidence.

28. This definition of biological sex is not universally accepted. For example, philosopher and legal scholar Edward Stein maintains that infertility prohibits defining sex in terms of reproductive roles claiming that defining sex in terms of these roles would define "infertile males as females"<sup>4</sup> or postmenopausal females would be considered males.

29. Biological sex can still be defined strictly in terms of the structure of reproductive systems. Infertility can be caused by many problems. However, the reproductive system continues to exist for the purpose of producing children. Another point can be made about heterosexual couples who choose not to reproduce for any of a variety of reasons. The male and female reproductive systems are generally clearly recognizable, regardless of whether or not they are being used for purposes of reproduction.

30. The first major academic article to use the term "gender" appears to be the 1955 paper by the psychiatry professor John Money of Johns Hopkins on the treatment of

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<sup>4</sup> Edward Stein, *The Mismeasure of Desire: The Science, Theory, and Ethics of Sexual Orientation* (New York: Oxford University Press, 1999), 31.

“intersex” children (the term then used was “hermaphrodites”).<sup>5</sup> “Intersex” conditions refer to disorders of sexual development (“DSDs”) that render an individual’s sexual anatomy ambiguous. For example, the clitoris and penis are derived from the same embryonic structures. A baby may display an abnormally large clitoris or an abnormally small penis, causing its biological sex to be difficult to determine long after birth.

31. Money posited that gender identity, at least for intersex children, was fluid and that it could be constructed. In his mind, making a child identify with a gender only required constructing sex-typical genitalia and creating a gender-appropriate environment for the child. The chosen gender for these children was often female—a decision that was not based on genetics or biology, nor on the belief that these children were “really” girls, but, in part, on the fact that at the time it was easier surgically to construct a vagina than it was to construct a penis.

32. The most widely known patient of Dr. Money was David Reimer, a boy who was not born with an intersex condition but whose penis was damaged during circumcision as an infant.<sup>6</sup> David was raised by his parents as a girl named Brenda, and provided with both surgical and hormonal interventions to ensure that he would develop female-typical sex characteristics. However, the attempt to conceal from the child what had happened to him was not successful—he self-identified as a boy, and eventually, at the age of 14, his psychiatrist recommended to his parents that they tell him the truth. David then began the difficult process of reversing the hormonal and surgical interventions that had been performed to feminize his body. But he continued to be tormented by his childhood ordeal,

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<sup>5</sup> John Money, “Hermaphroditism, gender and precocity in hyperadrenocorticism: psychologic findings,” *Bulletin of the Johns Hopkins Hospital* 95, no. 6 (1955): 253–264, <http://www.ncbi.nlm.nih.gov/pubmed/14378807>.

<sup>6</sup> An account of the David Reimer story can be found in John Colapinto, *As Nature Made Him: The Boy Who Was Raised as a Girl* (New York: Harper Collins, 2000).

and took his own life in 2004, at the age of 38.

33. David Reimer is just one example of the harm wrought by theories that gender can socially and medically be reassigned in children. Biological sex is not a concept that can be reduced to, or artificially assigned on, the basis of the type of external genitalia alone. Genitalia correlates highly with, but it is not completely predictive, of the role in reproduction

34. Surgeons are becoming more capable of constructing artificial genitalia, but these anatomical alterations do not change the biological sex of the recipients, who are no more capable of playing the reproductive roles of the opposite biological sex than they were without the surgery. Nor does biological sex change as a function of the environment provided for the child. No degree of supporting a little boy in converting to be considered, by himself and others, to be a little girl makes him biologically a little girl. The scientific definition of biological sex is, for almost all human beings, clear, binary, and stable, reflecting an underlying biological reality that is not contradicted by exceptions to sex-typical behavior, and cannot be altered by surgery or social conditioning.

35. Research by William G. Reiner, a pediatric urologist and child and adolescent psychiatrist, and John P. Gearhart, a professor of pediatric urology indicates that gender is not arbitrary; it suggests that a biological male (or female) will probably not come to identify as the opposite gender after having been altered physically and immersed into the corresponding gender-typical environment. The plasticity of gender appears to have a limit.

36. In a 2004 paper, Reiner and Gearhart followed up on the sexual identities of 16 genetic males affected by cloacal exstrophy—a condition involving a badly deformed bladder and genitals. Of the 16 subjects, 14 were assigned female sex at birth, receiving



surgical interventions to construct female genitalia, and were raised as girls by their parents; 6 of these 14 later chose to identify as males, while 5 continued to identify as females. Two individuals declared themselves males at a young age but continued to be raised as females because their parents rejected the children's declarations. The remaining subject, who had been told at age 12 that he was born male, refused to discuss sexual identity.<sup>7</sup> So the assignment of female sex persisted in only 5 of the 13 cases with known results.

37. This lack of persistence is some evidence that the assignment of sex through genital construction at birth with immersion into a "gender-appropriate" environment is not likely to be a successful option for managing the rare problem of genital ambiguity from birth defects. This suggests that gender identity can be a complex and burdensome issue for those who choose (or have others choose for them) a gender identity opposite their biological sex. It is important to note that the ages of these individuals at last follow-up ranged from 9 to 19, so it is possible that more of them may have subsequently changed their gender identities.

38. In a 2004 article summarizing the results of research related to intersex conditions, Paul McHugh, the former chief of psychiatry at Johns Hopkins Hospital, suggested:

We in the Johns Hopkins Psychiatry Department eventually concluded that human sexual identity is mostly built into our constitution by the genes we inherit and the embryogenesis we undergo. Male hormones sexualize the brain and the mind. Sexual dysphoria—a sense of disquiet in one's sexual role—naturally occurs amongst those rare males who are raised as females in an effort to correct an infantile genital structural problem.<sup>8</sup>

39. Gender has been defined in terms of sex-typical traits and behaviors. Thus, being a

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<sup>7</sup> William G. Reiner and John P. Gearhart, "Discordant Sexual Identity in Some Genetic Males with Cloacal Exstrophy Assigned to Female Sex at Birth," *New England Journal of Medicine*, 350 (January 2004): 333–341, <http://dx.doi.org/10.1056/NEJMoa022236>.

<sup>8</sup> Paul McHugh, "Surgical Sex: Why We Stopped Doing Sex Change Operations," *First Things* (November 2004): 37, <http://www.firstthings.com/article/2004/11/surgical-sex>.

boy means behaving in the ways boys typically behave—such as engaging in rough-and-tumble play and expressing an interest in sports and liking toy guns more than dolls. But this would imply that a boy who plays with dolls, hates guns, and refrains from sports or rough-and-tumble play might be considered to be a girl, rather than a boy who represents an exception to the typical patterns of male behavior. Sex-typical behavior is a poor means of identifying gender. Gender identity relies on an understanding of maleness and femaleness that is independent of these stereotypical “sex-appropriate” behaviors.

40. Scientific assertions that gender identity is innate or fixed at a young age and that gender identity has a strong biological basis are simply unsubstantiated. Scientific evidence shows that gender identity is fluid in childhood and can not be defined in terms of biology.

#### **Gender Dysphoria and Transgenderism in Adults and Children**

41. As a way of surveying the biological and social science research on gender dysphoria, I can list a number of important questions:

- \* Are there biological factors that influence the development of a gender identity that does not correspond with one’s biological sex?
- \* Are some individuals born with a gender identity different from their biological sex?
- \* Is gender identity shaped by environmental or nurturing conditions?
- \* How stable are choices of gender identity?
- \* How common is gender dysphoria? Is it persistent across the lifespan?
- \* Can a little boy who thinks he is a little girl change over the course of his life to regard himself as male? If so, how often can such people change their gender identities?
- \* How would someone’s gender identity be measured scientifically?
- \* Does self-understanding suffice? Does a biological girl become a gender boy by believing, or at least stating, she is a little boy?

- \* Do people's struggles with a sense of incongruity between their gender identity and biological sex persist over the life course?
- \* Does gender dysphoria respond to psychiatric interventions? Should those interventions focus on affirming the gender identity of the patient or take a more neutral stance?
- \* Do efforts to hormonally or surgically modify an individual's primary or secondary sex characteristics help resolve gender dysphoria?
- \* Does modification create further psychiatric problems for some of those diagnosed with gender dysphoria, or does it typically resolve existing psychiatric problems?

42. While biological sex is, with very few exceptions, a well-defined, binary trait (male versus female) corresponding to how the body is organized for reproduction, "gender identity" is a more subjective attribute. For most people, their own gender is undoubtedly not a topic of concern; most biological males identify as boys or men, and most biological females identify as girls or women. However, some individuals experience an incongruence between their biological sex and their gender identity. If this struggle causes them to seek professional help, then the problem is classified as "gender dysphoria."

43. The cases of gender dysphoria that are the subject of much public debate are those in which an individual comes to identify as a gender different from their biological sex. These people are usually identified, and describe themselves, as "transgender."<sup>9</sup>

44. According to the fifth edition of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*, gender dysphoria is marked by

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<sup>9</sup> A note on terminology: I generally use the term *transgender* to refer to persons for whom there is an incongruity between the gender identity they understand themselves to possess and their biological sex. We use the term *transsexual* to refer to individuals who have undergone medical interventions to transform their appearance to better correspond with that of their preferred gender. The most familiar colloquial term used to describe the medical interventions that transform the appearance of transgender individuals may be "sex change" (or, in the case of surgery, "sex-change operation"), but this is not commonly used in the scientific and medical literature today. While no simple terms for these procedures are completely satisfactory, in this declaration I employ the commonly used terms *sex reassignment* and *sex-reassignment surgery*, except when quoting a source that uses "gender reassignment" or some other term.

“incongruence between one’s experienced/expressed gender and assigned gender,” as well as “clinically significant distress or impairment in social, occupational, or other important areas of functioning.”<sup>10</sup>

45. It is important to clarify that gender dysphoria is not the same as gender nonconformity or gender identity disorder. Gender nonconformity describes an individual who behaves in a manner contrary to the gender-specific norms of his or her biological sex. As the *DSM-5* notes, most transvestites, for instance, are not transgender—men who dress as women typically do not identify themselves as women.<sup>11</sup> (However, certain forms of transvestism can be associated with late-onset gender dysphoria.<sup>12</sup>) Gender identity disorder, is an obsolete term from an earlier version of the *DSM* that was removed in its fifth edition. It was used as a psychiatric diagnosis. If we compare the diagnostic criteria for gender dysphoria (the current term) and gender identity disorder (the former term), we see that both require the patient to display “a marked incongruence between one’s experienced/expressed gender and assigned gender.”<sup>13</sup> The key difference is that a diagnosis of gender dysphoria requires the patient additionally to experience a “clinically significant distress or impairment in social, occupational, or other important areas of functioning” associated with these incongruent feelings.<sup>14</sup> Thus the major set of diagnostic criteria used in contemporary psychiatry does not designate all transgender individuals as having a psychiatric disorder. For example, a biological male who identifies himself as a female is not considered to have a

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<sup>10</sup> American Psychiatric Association, “Gender Dysphoria,” *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* [hereafter *DSM-5*] (Arlington, Va.: American Psychiatric Publishing, 2013), 452, <http://dx.doi.org/10.1176/appi.books.9780890425596.dsm14>.

<sup>11</sup> *Ibid.*, 458.

<sup>12</sup> *Ibid.*

<sup>13</sup> *Ibid.*, 452.

<sup>14</sup> *Ibid.*

psychiatric disorder unless the individual is experiencing significant psychosocial distress at the incongruence. A diagnosis of gender dysphoria may be part of the criteria used to justify sex-reassignment surgery or other clinical interventions. Furthermore, a patient who has had medical or surgical modifications to express his or her gender identity may still suffer from gender dysphoria. It is the nature of the struggle that defines the disorder, not the fact that the expressed gender differs from the biological sex. There is no scientific evidence, nor is it likely, that all transgender people have gender dysphoria, or that they are all struggling with their gender identities. Some individuals who are not transgender—that is, who do not identify as a gender that does not correspond with their biological sex—might nonetheless struggle with their gender identity; for example, girls who behave in some male-typical ways might experience various forms of distress without ever coming to identify as boys.

Conversely, individuals who do identify as a gender that does not correspond with their biological sex may not experience clinically significant distress related to their gender identity. Even if only, say, 40% of individuals who identify as a gender that does not correspond with their biological sex experience significant distress related to their gender identity, this would constitute a public health issue requiring clinicians and others to act to support those with gender dysphoria, and hopefully, to reduce the rate of gender dysphoria in the population. There is no evidence to suggest that the other 60% in this hypothetical—that is, the individuals who identify as a gender that does not correspond with their biological sex but who do not experience significant distress—would require clinical treatment.

46. The *DSM-5* criteria for a diagnosis of gender dysphoria in children are defined in a “more concrete, behavioral manner than those for adolescents and adults.”<sup>15</sup> This is to say

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<sup>15</sup> *Ibid.*, 454–455.

that some of the diagnostic criteria for gender dysphoria in children refer to behaviors that are stereotypically associated with the opposite gender. Clinically significant distress is still necessary for a diagnosis of gender dysphoria in children, but some of the other diagnostic criteria include, for instance, a “strong preference for the toys, games, or activities stereotypically used or engaged in by the other gender.”<sup>16</sup> What of girls that are “tomboys” or boys who are not oriented toward violence and guns, who prefer quieter play? Should parents worry that their tomboy daughter is really a boy stuck in a girl’s body?

47. The *DSM-5* criterion for diagnosing gender dysphoria by reference to gender-typical play preferences is unsound; it appears to ignore the fact that a child could display an *expressed* gender—manifested by social or behavioral traits—incongruent with the child’s biological sex but without *identifying* as the opposite gender. There is no scientific basis for believing that playing with toys typical of boys defines a child as a boy, or that playing with toys typical of girls defines a child as a girl.

48. Furthermore, even for children who do identify as a gender opposite their biological sex, diagnoses of gender dysphoria are simply unreliable. The reality is that they may have psychological difficulties in accepting their biological sex as their gender. Children can have difficulty with the expectations associated with those gender roles. Traumatic experiences can also cause a child to express distress with the gender associated with his or her biological sex.

49. Gender identity problems can also arise with intersex conditions<sup>17</sup> (the presence of

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<sup>16</sup> *Ibid.*, 452.

<sup>17</sup> American Psychiatric Association, “Gender Dysphoria,” *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (Arlington, Va.: American Psychiatric Publishing, 2014), <http://dx.doi.org/10.1176/appi.books.9781585625048.gg39>.

ambiguous genitalia due to genetic abnormalities), which were discussed earlier. These disorders of sex development, while rare, can contribute to gender dysphoria in some cases.<sup>18</sup>

50. A review of the neurobiological and genetic research on gender and gender identity provides virtually no evidence that the gender or gender identity has a biological basis.

51. Interpretations, usually in popular outlets, claiming or suggesting that a statistically significant difference between the brains of people who are transgender and those who are not is the cause of being transgendered or not—that is to say, that biological differences determine the differences in gender identity—are unwarranted. Current studies on associations between brain structure and transgender identity are small, methodologically limited, inconclusive, and sometimes contradictory. Even if they were more methodologically reliable, they would be insufficient to demonstrate that brain structure is a cause, rather than an effect, of the gender-identity behavior. They would likewise lack predictive power, the real challenge for any theory in science.

52. While there are many cases of gender dysphoria that are not associated with these identifiable intersex conditions, gender dysphoria may still represent a different type of intersex condition in which the primary sex characteristics such as genitalia develop normally while secondary sex characteristics associated with the brain develop along the lines of the opposite sex. Controversy exists over influences determining the nature of neurological, psychological, and behavioral sex differences. The emerging consensus is that there may be some differences in patterns of neurological development in- and ex-utero for men and women.<sup>i</sup> Therefore, in theory, transgender individuals could be subject to conditions allowing a more female-type brain to develop within a genetic male (having the XY chromosomal patterns), and vice versa. However, as we will show in the next section, Although emerging consensus recognizes that there may be some differences in patterns of neurological development in- and ex-utero for men and women,<sup>ii</sup> research supporting the

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<sup>18</sup> *Ibid.*, 457.

idea that such influences could account for transgenderism is quite minimal.

53. Robert Sapolsky, a Stanford professor of biology who has done extensive neuroimaging research, suggested a possible neurobiological explanation for transgenderism in a 2013 *Wall Street Journal* article, “Caught Between Male and Female.” He asserted that recent neuroimaging studies of the brains of transgender adults suggest that they may have brain structures more similar to their gender identity than to their biological sex.<sup>iii</sup> Sapolsky bases this assertion on the fact that there are differences between male and female brains, and while the differences are “small and variable,” they “probably contribute to the sex differences in learning, emotion and socialization.”<sup>iv</sup> He concludes: “The issue isn’t that sometimes people believe they are of a different gender than they actually are. Remarkably, instead, it’s that sometimes people are born with bodies whose gender is different from what they actually are.”<sup>v</sup> In other words, he claims that some people can have a female-type brain in a male body, or vice versa.

54. While this kind of neurobiological theory of transgenderism remains outside of the scientific mainstream, it has recently received extensive popular attention. It provides a potentially attractive explanation for transgenderism, especially for individuals who are not affected by any known genetic, hormonal, or psychosocial abnormalities.<sup>vi</sup> However, there is fairly little support in the scientific literature for Sapolsky’s contention. His neurological explanation for differences between male and female brains, and those differences’ possible relevance to transgenderism warrant further scientific consideration. There are many small studies that attempt to define causal factors of transgenderism, or of the experience of incongruence between one’s biological sex and felt gender. These studies are described in the following pages, each pointing to an influence that may contribute to the explanation for transgenderism, or gender dysphoria.

55. Nancy Segal, a psychologist and geneticist, researched two case studies of identical twins discordant for female-to-male (FtM) transsexualism.<sup>vii</sup> Segal notes that, according to another, earlier study that conducted nonclinical interviews with 45 FtM transsexuals, 60% suffered some form of childhood abuse, with 31% experiencing sexual abuse, 29% experiencing emotional abuse, and 38%



physical abuse.<sup>viii</sup> However, this earlier study did not include a control group and was limited by its small sample size, making it difficult to extract significant interactions, or generalizations, from the data.

56. Segal's own first case study was of a 34-year-old FtM twin, whose identical twin sister was married and the mother of seven children.<sup>ix</sup> Several stressful events had occurred during the twins' mother's pregnancy, and they were born five weeks prematurely. When they were eight years old, their parents divorced. The FtM twin exhibited gender-nonconforming behavior early and it persisted throughout childhood. She became attracted to other girls in junior high school and as a teenager attempted suicide several times. She reported physical abuse and emotional abuse at the hand of her mother. The twins were raised in a Mormon household, in which transsexuality was not tolerated.<sup>x</sup> The twin sister had never questioned her gender identity but did experience some depression. For Segal, the FtM twin's gender nonconformity and abuse in childhood were factors that contributed to gender dysphoria; the other twin was not subject to the same stressors in childhood, and did not develop issues around her gender identity. Segal's second case study also concerned identical twins with one twin transitioning from female to male.<sup>xi</sup> This FtM twin had early-onset nonconforming behaviors and attempted suicide as a young adult. At age 29 she underwent reassignment surgery, was well supported by family, met a woman, and married. As in the first case, the other twin was reportedly always secure in her female gender identity.

57. Segal speculates that each set of twins may have had uneven prenatal androgen exposures (although her study did not offer evidence to support this)<sup>xii</sup> and concludes that "Transsexualism is unlikely to be associated with a major gene, but is likely to be associated with multiple genetic, epigenetic, developmental and experiential influences."<sup>xiii</sup> Segal is critical of the notion that the maternal abuse experienced by the FtM twin in her first case study may have played a causal role in the twin's "atypical gender identification" since the abuse "apparently *followed*" the twin's gender-atypical behaviors—though Segal acknowledges "it is possible that this abuse reinforced his already atypical gender identification."<sup>xiv</sup> These case studies, while informative, are not scientifically strong,

and do not provide direct evidence for any causal hypotheses about the origins of atypical gender identification.

58. A source of more information—but also inadequate to make direct causal inferences—is a case analysis by Mayo Clinic psychiatrists J. Michael Bostwick and Kari A. Martin of an intersex individual born with ambiguous genitalia who was operated on and raised as a female.<sup>xv</sup> By way of offering some background, the authors draw a distinction between gender identity disorder (an “inconsistency between perceived gender identity and phenotypic sex” that generally involves “no discernible neuroendocrinological abnormality”<sup>xvi</sup>), and intersexuality (a condition in which biological features of both sexes are present). They also provide a summary and classification scheme of the various types of intersex disorders. After a thorough discussion of the various intersex developmental issues that can lead to a disjunction between the brain and body, the authors acknowledge that “Some adult patients with severe dysphoria—transsexuals—have neither history nor objective findings supporting a known biological cause of brain-body disjunction.”<sup>xvii</sup> These patients require thorough medical and psychiatric attention to avoid gender dysphoria.

59. After this helpful summary, the authors state that “Absent psychosis or severe character pathology, patients’ subjective assertions are presently the most reliable standards for delineating core gender identity.”<sup>xviii</sup> But it is not clear how we could consider subjective assertions more reliable in establishing gender identity, unless gender identity is defined as a completely subjective phenomenon. The bulk of the article is devoted to describing the various objectively discernible and identifiable ways in which one’s identity as a male or female is imprinted on the nervous and endocrine system. Even when something goes wrong with the development of external genitalia, individuals are more likely to act in accordance with their chromosomal and hormonal makeup.<sup>xix</sup>

60. In 2011, Giuseppina Rametti and colleagues from various research centers in Spain used MRI to study the brain structures of 18 FtM transsexuals who exhibited gender nonconformity early in life and experienced sexual attraction to females prior to hormone treatment.<sup>xx</sup> The goal was to learn whether their brain features corresponded more to their biological sex or to their sense of

gender identity. The control group consisted of 24 male and 19 female heterosexuals with gender identities conforming to their biological sex. Differences were noted in the white matter microstructure of specific brain areas. In untreated FtM transsexuals, that structure was more similar to that of heterosexual males than to that of heterosexual females in three of four brain areas.<sup>xxi</sup> In a complementary study, Rametti and colleagues compared 18 MtF transsexuals to 19 female and 19 male heterosexual controls.<sup>xxii</sup> These MtF transsexuals had white matter tract averages in several brain areas that fell between the averages of the control males and the control females. The values, however, were typically closer to the males (that is, to those that shared their biological sex) than to the females in most areas.<sup>xxiii</sup> In controls the authors found that, as expected, the males had greater amounts of gray and white matter and higher volumes of cerebrospinal fluid than control females. The MtF transsexual brain volumes were all similar to those of male controls and significantly different from those of females.<sup>xxiv</sup>

61. Overall, the findings of these studies by Rametti and colleagues do not sufficiently support the notion that transgender individuals have brains more similar to their preferred gender than to the gender corresponding with their biological sex. Both studies are limited by small sample sizes and lack of a prospective hypothesis—both analyzed the MRI data to find the gender differences and then looked to see where the data from transgender subjects fit.

62. Whereas both of these MRI studies looked at brain *structure*, a functional MRI study by Emiliano Santarnecchi and colleagues from the University of Siena and the University of Florence looked at brain *function*, examining gender-related differences in spontaneous brain activity during the resting state.<sup>xxv</sup> The researchers compared a single FtM individual (declared cross-gender since childhood), and control groups of 25 males and 25 females, with regard to spontaneous brain activity. The FtM individual demonstrated a “brain activity profile more close to his biological sex than to his desired one,” and based in part on this result the authors concluded that “untreated FtM transsexuals show a functional connectivity profile comparable to female control subjects.”<sup>xxvi</sup> With a sample size of one, this study’s statistical power is virtually zero.

63. In 2013, Hsaio-Lun Ku and colleagues from various medical centers and research institutes in Taiwan also conducted functional brain imaging studies. They compared the brain activity of 41 transsexuals (21 FtMs, 20 MtFs) and 38 matched heterosexual controls (19 males and 19 females).<sup>xxvii</sup> Arousal response of each cohort while viewing neutral as compared to erotic films was compared between groups. All of the transsexuals in the study reported sexual attractions to members of their natal, biological sex, and exhibited more sexual arousal than heterosexual controls when viewing erotic films that depicted sexual activity between subjects sharing their biological sex. A “selfness” score was also incorporated into the study, in which the researchers asked participants to “rate the degree to which you identify yourself as the male or female in the film.”<sup>xxviii</sup> The transsexuals in the study identified with those of their preferred gender more than the controls identified with those of their biological gender, in both erotic films and neutral films. The heterosexual controls did not identify themselves with either males or females in either of the film types. Ku and colleagues claim to have demonstrated characteristic brain patterns for sexual attraction as related to biological sex but did not make meaningful neurobiological gender-identity comparisons among the three cohorts. In addition, they reported findings that transsexuals demonstrated psychosocial maladaptive defensive styles.

64. A 2008 study by Hans Berglund and colleagues from Sweden’s Karolinska Institute and Stockholm Brain Institute used PET and fMRI scans to compare brain-area activation patterns in 12 MtF transgendered individuals who were sexually attracted to women with those of 12 heterosexual women and 12 heterosexual men.<sup>xxix</sup> The first set of subjects took no hormones and had not undergone sex-reassignment surgery. The experiment involved smelling odorous steroids thought to be female pheromones, and other sexually neutral odors such as lavender oil, cedar oil, eugenol, butanol, and odorless air. The results were varied and mixed between the groups for the various odors, which should not be surprising, since *post hoc* analyses usually lead to contradictory findings.

65. The studies presented above show inconclusive evidence and mixed findings regarding the brains of transgender adults. Brain-activation patterns in these studies do not offer sufficient

evidence for drawing sound conclusions about possible associations between brain activation and sexual identity or arousal. The results are conflicting and confusing. Since the data by Ku and colleagues on brain-activation patterns are not universally associated with a particular sex, it remains unclear whether and to what extent neurobiological findings say anything meaningful about gender identity.

66. It is important to note that regardless of their findings, studies of this kind cannot support any conclusion that individuals come to identify as a gender that does not correspond to their biological sex because of an innate, biological condition of the brain. In most cases transgender individuals have been acting and thinking for years in ways that, through learned behavior and associated neuroplasticity—the fact that external stimuli can change the brain—may have produced brain changes that could differentiate them from other members of their biological or natal sex.

67. The only definitive way to establish epidemiological causality between a brain feature and a trait (especially one as elusive and vague as gender identity) would be to conduct prospective, longitudinal, preferably randomly sampled and population-based studies. The question is not simply whether there are differences between the brains of transgender individuals and people identifying with the gender corresponding to their biological sex, but whether gender identity is a fixed, innate, and biological trait, even when it does not correspond to biological sex, or whether environmental or psychological causes contribute to the development of a sense of gender identity in such cases. Neurological differences in transgender adults might be the consequence of biological factors such as genes or prenatal hormone exposure, or of psychological and environmental factors such as childhood abuse, or they could result from some combination of the two.

68. There are no serial, longitudinal, or prospective studies looking at the brains of cross-gender identifying children who develop to later identify as transgender adults. Lack of this research severely limits our ability to understand causal relationships between brain morphology, or functional activity, and the later development of gender identity different from biological sex.

69. More generally, it is now widely recognized among psychiatrists and neuroscientists who

engage in brain imaging research that there are inherent and ineradicable methodological limitations of *any* neuroimaging study that simply associates a particular trait, such as a certain behavior, with a particular brain morphology.<sup>xxx</sup> (And when the trait in question is not a concrete behavior but something as elusive and vague as “gender identity,” these methodological problems are even more serious.) These studies cannot provide statistical evidence nor show a plausible biological mechanism strong enough to support *causal connections* between a brain feature and the trait, behavior, or symptom in question. To support a conclusion of causality, even epidemiological causality, we need to conduct prospective longitudinal panel studies of a fixed set of individuals across the course of sexual development if not their lifespan.

70. Studies like these would use serial brain images at birth, in childhood, and at other points along the developmental continuum, to see whether brain morphology findings were there from the beginning. Otherwise, we cannot establish whether certain brain features caused a trait, or whether the trait is innate and perhaps fixed. Studies like those discussed above of individuals who already exhibit the trait are incapable of distinguishing between *causes* and *consequences* of the trait. In the absence of such prospective longitudinal studies, large representative population-based samples with adequate statistical controls for confounding factors may help narrow the possible causes of a behavioral trait and thereby increase the probability of identifying a neurological cause.<sup>xxxi</sup> However, because the studies conducted thus far use small convenience samples, none of them is especially helpful for narrowing down the options for causality. To obtain a better study sample, we would need to include neuroimaging in large-scale epidemiological studies. In fact, given the small number of transgender individuals in the general population,<sup>xxxii</sup> the studies would need to be prohibitively large to attain findings that would reach statistical significance. Moreover, if a study found significant differences between these groups—that is, a number of differences higher than what would be expected by chance alone—these differences would refer to the average in a population of each group. Even if these two *groups* differed significantly for all 100 measurements, it would not necessarily indicate a biological difference among *individuals* at the extremes of the distribution.

Thus, a randomly selected transgender individual and a randomly selected non-transgender individual might not differ on any of these 100 measurements. Additionally, since the probability that a randomly selected person from the general population will be transgender is quite small, statistically significant differences in the sample means are not sufficient evidence to conclude that a particular measurement is predictive of whether the person is transgender or not. If we measured the brain of an infant, toddler, or adolescent and found this individual to be closer to one cohort than another on these measures, it would not imply that this individual would grow up to identify as a member of that cohort. It may be helpful to keep this caveat in mind when interpreting research on transgender individuals. In this context, it is important to note that there are no studies that demonstrate that any of the biological differences being examined have predictive power, and so all interpretations, usually in popular outlets, claiming or suggesting that a statistically significant difference between the brains of people who are transgender and those that are not is the cause of being transgendered or not—that is to say, that the biological differences determine the differences in gender identity—are unwarranted.

71. In short, the current studies on associations between brain structure and transgender identity are small, methodologically limited, inconclusive, and sometimes contradictory. Even if they were more methodologically reliable, they would be insufficient to demonstrate that brain structure is a cause, rather than an effect, of the gender-identity behavior. They would likewise lack predictive power, the real challenge for any theory in science.

72. For a simple example to illustrate this point, suppose we had a room with 100 people in it. Two of them are transgender and all others are not. I pick someone at random and ask you to guess the person's gender identity. If you know that 98 out of 100 of the individuals are not transgender, the safest bet would be to guess that the individual is not transgender, since that answer will be correct 98% of the time. Suppose, then, that you have the opportunity to ask questions about the neurobiology and about the natal sex of the person. Knowing the biology only helps in predicting whether the individual is transgender if it can improve on the original guess that the person is not

transgender. So if knowing a characteristic of the individual's brain does not improve the ability to predict what group the patient belongs to, then the fact that the two groups differ at the mean is almost irrelevant. Improving on the original prediction is very difficult for a rare trait such as being transgender, because the probability of that prediction being correct is already very high. If there really were a clear difference between the brains of transgender and non-transgender individuals, akin to the biological differences between the sexes, then improving on the original guess would be relatively easy. Unlike the differences between the sexes, however, there are no biological features that can reliably identify transgender individuals as different from others.

73. The consensus of scientific evidence overwhelmingly supports the proposition that a physically and developmentally normal boy or girl is indeed what he or she appears to be at birth. The available evidence from brain imaging and genetics does not demonstrate that the development of gender identity as different from biological sex is innate. Because scientists have not established a solid framework for understanding the causes of cross-gender identification, ongoing research should be open to psychological and social causes, as well as biological ones.

74. More generally, it is now widely recognized among psychiatrists and neuroscientists who engage in brain imaging research that there are inherent and ineradicable methodological limitations of *any* neuroimaging study that simply associates a particular trait, such as a certain behavior, with a particular brain morphology.<sup>19</sup> (And when the trait in question is not a concrete behavior but something as elusive and vague as “gender identity,” these methodological problems are even more serious.) These studies cannot provide statistical evidence nor show a plausible biological mechanism strong enough to support *causal connections* between a brain feature and the trait, behavior, or symptom in question. To support a conclusion of causality, even epidemiological causality, we need to conduct prospective longitudinal panel studies of a fixed set of individuals across the course of sexual development if not their lifespan.

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<sup>19</sup> See, for example, Sally Satel and Scott D. Lilienfeld, *Brainwashed: The Seductive Appeal of Mindless Neuroscience*, (New York: Basic Books, 2013).



75. The consensus of scientific evidence overwhelmingly supports the proposition that a physically and developmentally normal boy or girl is indeed what he or she appears to be at birth. The available evidence from brain imaging and genetics does not demonstrate that the development of gender identity as different from biological sex is innate. Because scientists have not established a solid framework for understanding the causes of cross-gender identification, ongoing research should be open to psychological and social causes, as well as biological ones.

### **Treatment of Gender Dysphoria in Children and Adolescents**

76. Popular notion has inspired a gender-affirming approach to children who experience gender identity issues at an early age, but there is little evidence that gender identity issues have a high rate of persistence in children. According to the *DSM-5*, “In natal [biological] males, persistence [of gender dysphoria] has ranged from 2.2% to 30%. In natal females, persistence has ranged from 12% to 50%.”<sup>20</sup> Scientific data on persistence of gender dysphoria remains sparse due to the very low prevalence of the disorder in the general population, but the wide range of findings in the literature suggests that there is still much that we do not know about why gender dysphoria persists or desists in children. As the *DSM-5* entry goes on to note, “It is unclear if children ‘encouraged’ or supported to live socially in the desired gender will show higher rates of persistence, since such children have not yet been followed longitudinally in a systematic manner.”<sup>21</sup> There is a clear need for more research in these areas, and for parents and therapists to acknowledge the great uncertainty regarding how to interpret the behavior of these children.

77. With the uncertainty surrounding the diagnosis of and prognosis for gender dysphoria in children, therapeutic decisions are particularly complex and difficult. Therapeutic interventions for children must take into account the probability that the children may outgrow cross-gender

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<sup>20</sup> American Psychiatric Association, “Gender Dysphoria,” *DSM-5*, 455. Note: Although the quotation comes from the *DSM-5* entry for “gender dysphoria” and implies that the listed persistence rates apply to that precise diagnosis, the diagnosis of gender dysphoria was formalized by the *DSM-5*, so some of the studies from which the persistence rates were drawn may have employed earlier diagnostic criteria.

<sup>21</sup> *Ibid.*, 455.

identification.

78. University of Toronto researcher and therapist Kenneth Zucker believes that family and peer dynamics can play a significant role in the development and persistence of gender-nonconforming behavior, writing that

it is important to consider both predisposing and perpetuating factors that might inform a clinical formulation and the development of a therapeutic plan: the role of temperament, parental reinforcement of cross-gender behavior during the sensitive period of gender identity formation, family dynamics, parental psychopathology, peer relationships and the multiple meanings that might underlie the child's fantasy of becoming a member of the opposite sex.<sup>22</sup>

79. Zucker worked for decades with children experiencing feelings of gender incongruence, offering psychosocial treatments to help them embrace the gender corresponding with their biological sex—for instance, talk therapy, parent-arranged play dates with same-sex peers, therapy for co-occurring psychopathological issues such as autism spectrum disorder, and parent counseling.<sup>23</sup>

80. In a follow-up study by Zucker and colleagues of children treated by them over the course of thirty years at the Center for Mental Health and Addiction in Toronto, they found that gender identity disorder persisted in only 3 of the 25 girls they had treated.<sup>24</sup> (Zucker's clinic was closed by the Canadian government in 2015.<sup>25</sup>)

81. An alternative to Zucker's approach that emphasizes affirming the child's preferred gender

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<sup>22</sup> Kenneth J. Zucker, "Children with gender identity disorder: Is there a best practice?," *Neuropsychiatrie de l'Enfance et de l'Adolescence* 56, no. 6 (2008): 363, <http://dx.doi.org/10.1016/j.neurenf.2008.06.003>.

<sup>23</sup> Kenneth J. Zucker *et al.*, "A Developmental, Biopsychosocial Model for the Treatment of Children with Gender Identity Disorder," *Journal of Homosexuality* 59, no. 2 (2012), <http://dx.doi.org/10.1080/00918369.2012.653309>. For an accessible summary of Zucker's approach to treating gender dysphoria in children, see J. Michael Bailey, *The Man Who Would Be Queen: The Science of Gender-Bending and Transsexualism* (Washington, D.C.: Joseph Henry Press, 2003), 31–32.

<sup>24</sup> Kelley D. Drummond *et al.*, "A follow-up study of girls with gender identity disorder," *Developmental Psychology* 44, no. 1 (2008): 34–45, <http://dx.doi.org/10.1037/0012-1649.44.1.34>.

<sup>25</sup> Jesse Singal, "How the Fight Over Transgender Kids Got a Leading Sex Researcher Fired," *New York Magazine*, February 7, 2016, <http://nymag.com/scienceofus/2016/02/fight-over-trans-kids-got-a-researcher-fired.html>.

identity has become more common among therapists.<sup>26</sup> This approach involves helping the children to self-identify even more with the opposite sex.

82. One component of the gender-affirming approach has been the use of hormone treatments for adolescents in order to delay the onset of sex-typical characteristics during puberty and alleviate the feelings of dysphoria the adolescents will experience as their bodies develop sex-typical characteristics that are at odds with the gender with which they identify. There is relatively little evidence for the therapeutic value of these kinds of puberty-delaying treatments, but they are currently the subject of a large clinical study sponsored by the National Institutes of Health.<sup>27</sup>

83. The purpose of pubertal suppression with medications is to delay the onset of puberty in order to allow more time for the individual to make their decision as to their “gender identity.” Often it is a legal requirement since almost all surgeries are not done until a child reaches the age of consent.

84. While epidemiological data on the outcomes of medically delayed puberty is quite limited, referrals for sex-reassignment hormones and surgical procedures appear to be on the rise, and there is a push among many advocates to proceed with sex reassignment at younger ages. According to a 2013 article in *The Times* of London, the United Kingdom saw a 50% increase in the number of children referred to gender dysphoria clinics from 2011 to 2012, and a nearly 50% increase in referrals among adults from 2010 to 2012.<sup>28</sup> Whether this increase can be attributed to rising rates of gender confusion, rising sensitivity to gender issues, growing acceptance of therapy as an option, or

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<sup>26</sup> See, for example, American Psychological Association, “Guidelines for Psychological Practice with Transgender and Gender Nonconforming People,” *American Psychologist* 70 no. 9, (2015): 832–864, <http://dx.doi.org/10.1037/a0039906>; and Marco A. Hidalgo *et al.*, “The Gender Affirmative Model: What We Know and What We Aim to Learn,” *Human Development* 56 (2013): 285–290, <http://dx.doi.org/10.1159/000355235>.

<sup>27</sup> Sara Reardon, “Largest ever study of transgender teenagers set to kick off,” *Nature* 531, no. 7596 (2016): 560, <http://dx.doi.org/10.1038/531560a>.

<sup>28</sup> Chris Smyth, “Better help urged for children with signs of gender dysphoria,” *The Times* (London), October 25, 2013, <http://www.thetimes.co.uk/tto/health/news/article3903783.ece>. According to the article, in 2012 “1,296 adults were referred to specialist gender dysphoria clinics, up from 879 in 2010. There are now [in 2013] 18,000 people in treatment, compared with 4,000 15 years ago. [In 2012] 208 children were referred, up from 139 the year before and 64 in 2008.”

other factors, the increase itself is concerning, and merits further scientific inquiry into the family dynamics and other potential problems, such as social rejection or developmental issues, that may be taken as signs of childhood gender dysphoria.

85. A study of psychological outcomes following puberty suppression and sex-reassignment surgery, published in the journal *Pediatrics* in 2014 by child and adolescent psychiatrist Annelou L.C. de Vries and colleagues, suggested improved outcomes for individuals after receiving these interventions, with well-being improving to a level similar to that of young adults from the general population.<sup>29</sup> This study looked at 55 transgender adolescents and young adults (22 MtF and 33 FtM) from a Dutch clinic who were assessed three times: before the start of puberty suppression (mean age: 13.6 years), when cross-sex hormones were introduced (mean age: 16.7 years), and at least one year after sex-reassignment surgery (mean age: 20.7 years). The study did not provide a matched group for comparison—that is, a group of transgender adolescents who did not receive puberty-blocking hormones, cross-sex hormones, and/or sex-reassignment surgery—which makes comparisons of outcomes more difficult.

86. In the study cohort, gender dysphoria improved over time, body image improved on some measures, and overall functioning improved modestly. Due to the lack of a matched control group it is unclear whether these changes are attributable to the procedures or would have occurred in this cohort without the medical and surgical interventions. Measures of anxiety, depression, and anger showed some improvements over time, but these findings did not reach statistical significance. While this study suggested some improvements over time in this cohort, particularly the reported subjective satisfaction with the procedures, detecting significant differences would require the study to be replicated with a matched control group and a larger sample size. The interventions also included care from a multidisciplinary team of medical professionals, which could have had a beneficial effect. Future studies of this kind would ideally include long-term follow-ups that assess outcomes

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<sup>29</sup> Annelou L.C. de Vries *et al.*, “Young Adult Psychological Outcome After Puberty Suppression and Gender Reassignment,” *Pediatrics* 134, no. 4 (2014): 696–704, <http://dx.doi.org/10.1542/peds.2013-2958d>.

and functioning beyond the late teens or early twenties.

#### **Treatment of Gender Dysphoria in Adults: Sex Reassignment Surgery**

87. As for therapeutic intervention in adults: The high level of uncertainty regarding various outcomes after sex-reassignment surgery makes it difficult to find clear answers about the effects on patients of reassignment surgery. The potential that patients undergoing medical and surgical sex reassignment may want to return to a gender identity consistent with their biological sex suggests that reassignment carries considerable psychological and physical risk, especially when performed in childhood, but also in adulthood. It suggests that the patients' pre-treatment beliefs about an ideal post-treatment life may sometimes go unrealized.

88. In 2004, Birmingham University's Aggressive Research Intelligence Facility (Arif) published an assessment of the findings of more than one hundred follow-up studies of post-operative transsexuals.<sup>30</sup> An article in *The Guardian* summarized the findings:

Arif...concludes that none of the studies provides conclusive evidence that gender reassignment is beneficial for patients. It found that most research was poorly designed, which skewed the results in favour of physically changing sex. There was no evaluation of whether other treatments, such as long-term counselling, might help transsexuals, or whether their gender confusion might lessen over time. Arif says the findings of the few studies that have tracked significant numbers of patients over several years were flawed because the researchers lost track of at least half of the participants. The potential complications of hormones and genital surgery, which include deep vein thrombosis and incontinence respectively, have not been thoroughly investigated, either. "There is huge uncertainty over whether changing someone's sex is a good or a bad thing," says Dr. Chris Hyde, director of Arif. "While no doubt great care is taken to ensure that appropriate patients undergo gender reassignment, there's still a large number of people who have the surgery but remain traumatized—often to the point of committing suicide."

89. The high level of uncertainty regarding various outcomes after sex-reassignment

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<sup>30</sup> David Batty, "Mistaken identity," *The Guardian*, July 30, 2004, <http://www.theguardian.com/society/2004/jul/31/health.socialcare>.

surgery makes it difficult to find clear answers about the effects on patients of reassignment surgery. Since 2004, there have been other studies on the efficacy of sex-reassignment surgery, using larger sample sizes and better methodologies. Some of the more informative and reliable studies on outcomes for individuals receiving sex-reassignment surgery are examined below.

90. As far back as 1979, Jon K. Meyer and Donna J. Reter published a longitudinal, follow-up study on the overall well-being of adults who underwent sex-reassignment surgery.<sup>31</sup> The study compared the outcomes of 15 people who received surgery with those of 35 people who requested but did not receive surgery (14 of these individuals eventually received surgery later, resulting in three cohorts of comparison: operated, not-operated, and operated later). Well-being was quantified using a scoring system that assessed psychiatric, economic, legal, and relationship outcome variables. Scores were determined by the researchers after performing interviews with the subjects. Average follow-up time was approximately five years for subjects who had sex change surgery, and about two years for those subjects who did not.

91. Compared to their condition before surgery, the individuals who had undergone surgery appeared to show some improvement in well-being, though the results had a fairly low level of statistical significance. Individuals who had no surgical intervention did display a statistically significant improvement at follow-up. However, there was no statistically significant difference between the two groups' scores of well-being at follow-up. The authors concluded that "sex reassignment surgery confers no objective advantage in terms of social rehabilitation, although it remains subjectively satisfying to those who have rigorously

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<sup>31</sup> Jon K. Meyer and Donna J. Reter, "Sex Reassignment: Follow-up," *Archives of General Psychiatry* 36, no. 9 (1979): 1010–1015, <http://dx.doi.org/10.1001/archpsyc.1979.01780090096010>.

pursued a trial period and who have undergone it.”<sup>32</sup> This study led the psychiatry department at Johns Hopkins Medical Center (JHMC) to discontinue surgical interventions for sex changes for adults.<sup>33</sup>

92. However, the study has important limitations. Selection bias was introduced in the study population, because the subjects were drawn from those individuals who sought sex-reassignment surgery at JHMC. In addition, the sample size was small. Also, the individuals who did not undergo sex-reassignment surgery but presented to JHMC for it did not represent a true control group. Random assignment of the surgical procedure was not possible. Large differences in the average follow-up time between those who underwent surgery and those who did not further reduces any capacity to draw valid comparisons between the two groups. Additionally, the study’s methodology was also criticized for the somewhat arbitrary and idiosyncratic way it measured the well-being of its subjects. Co-habitation or any form of contact with psychiatric services were scored as equally negative factors as having been arrested.<sup>34</sup>

93. In 2011, Cecilia Dhejne and colleagues from the Karolinska Institute and Gothenburg University in Sweden published one of the more robust and well-designed studies to examine outcomes for persons who underwent sex-reassignment surgery. Focusing on mortality, morbidity, and criminality rates, the matched cohort study compared a total of 324 transsexual persons (191 MtFs, 133 FtMs) who underwent sex reassignment between 1973 and 2003 to two age-matched controls: people of the same sex as the transsexual person at

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<sup>32</sup> *Ibid.*, 1015.

<sup>33</sup> See, for instance, Paul R. McHugh, “Surgical Sex,” *First Things* (November 2004), <http://www.firstthings.com/article/2004/11/surgical-sex>.

<sup>34</sup> Michael Fleming, Carol Steinman, and Gene Bocknek, “Methodological Problems in Assessing Sex-Reassignment Surgery: A Reply to Meyer and Reter,” *Archives of Sexual Behavior* 9, no. 5 (1980): 451–456, <http://dx.doi.org/10.1007/BF02115944>.

birth, and people of the sex to which the individual had been reassigned.<sup>35</sup>

94. Given the relatively low number of transsexual persons in the general population, the size of this study is impressive. Unlike Meyer and Reter, Dhejne and colleagues did not seek to evaluate the patient satisfaction after sex-reassignment surgery, which would have required a control group of transgender persons who desired to have sex-reassignment surgery but did not receive it. Also, the study did not compare outcome variables before and after sex-reassignment surgery; only outcomes after surgery were evaluated. We need to keep these caveats in mind as we look at what this study found. These two caveats need to be kept in mind.

95. Dhejne and colleagues found statistically significant differences between the two cohorts on several of the studied rates. For example, the postoperative transsexual individuals had an approximately three times higher risk for psychiatric hospitalization than the control groups, even after adjusting for prior psychiatric treatment.<sup>36</sup> (However, the risk of being hospitalized for substance abuse was not significantly higher after adjusting for prior psychiatric treatment, as well as other covariates.) Sex-reassigned individuals had nearly a three times higher risk of all-cause mortality after adjusting for covariates,<sup>37</sup> although the elevated risk was significant only for the time period of 1973–1988. Those undergoing surgery during this period were also at increased risk of being convicted of a crime.<sup>38</sup> Most alarmingly, sex-reassigned individuals were 4.9 times more likely to attempt

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<sup>35</sup> Cecilia Dhejne *et al.*, “Long-term follow-up of transsexual persons undergoing sex reassignment surgery: cohort study in Sweden,” *PLOS ONE* 6, no. 2 (2011): e16885, <http://dx.doi.org/10.1371/journal.pone.0016885>.

<sup>36</sup> 95% confidence interval: 2.0–3.9.

<sup>37</sup> 95% confidence interval: 1.8–4.3.

<sup>38</sup> MtF transsexuals in the study’s 1973–1988 period showed a higher risk of crime compared to the female controls, suggesting that they maintain a male pattern for criminality. That study period’s FtM transsexuals, however, did



suicide and 19.1 times more likely to die by suicide compared to controls.<sup>39</sup> “Mortality from suicide was strikingly high among sex-reassigned persons, including after adjustment for prior psychiatric morbidity.”<sup>40</sup>

96. The study design precludes drawing inferences “as to the effectiveness of sex reassignment as a treatment for transsexualism,” although Dhejne and colleagues state that it is possible that “things might have been even worse without sex reassignment.”<sup>41</sup> Overall, post-surgical mental health was quite poor, as indicated especially by the high rate of suicide attempts and all-cause mortality in the 1973–1988 group. (It is worth noting that for the transsexuals in the study who underwent sex reassignment from 1989 to 2003, there were of course fewer years of data available at the time the study was conducted than for those transsexuals from the earlier period. The rates of mortality, morbidity, and criminality in the later group may in time come to resemble the elevated risks of the earlier group.) In summary, this study suggests that sex-reassignment surgery may not rectify the comparatively poor health outcomes associated with transgender populations in general. Still, because of the limitations of this study mentioned above, the results also cannot establish that sex-reassignment surgery causes poor health outcomes.

97. In 2009, Annette Kuhn and colleagues from the University Hospital and University of Bern in Switzerland examined post-surgery quality of life in 52 MtF and 3 FtM

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show a higher risk of crime compared to the female controls, perhaps related to the effects of exogenous testosterone administration.

<sup>39</sup> 95% confidence intervals: 2.9–8.5 and 5.8–62.9, respectively.

<sup>40</sup> *Ibid.*, 6.

<sup>41</sup> *Ibid.*, 7.

transsexuals fifteen years after sex-reassignment surgery.<sup>42</sup> This study found considerably lower general life satisfaction in post-surgical transsexuals as compared with females who had at least one pelvic surgery in the past. The postoperative transsexuals reported lower satisfaction with their general quality of health and with some of the personal, physical, and social limitations they experienced with incontinence that resulted as a side effect of the surgery. Again, inferences cannot be drawn from this study regarding the efficacy of sex-reassignment surgery due to the lack of a control group of transgender individuals who did not receive sex-reassignment surgery.

98. In 2010, Mohammad Hassan Murad and colleagues from the Mayo Clinic published a systematic review of studies on the outcomes of hormonal therapies used in sex-reassignment procedures, finding that there was “very low quality evidence” that sex reassignment via hormonal interventions “likely improves gender dysphoria, psychological functioning and comorbidities, sexual function and overall quality of life.”<sup>43</sup> The authors identified 28 studies that together examined 1,833 patients who underwent sex-reassignment procedures that included hormonal interventions (1,093 male-to-female, 801 female-to-male).<sup>44</sup> Pooling data across studies showed that, after receiving sex-reassignment procedures, 80% of patients reported improvement in gender dysphoria, 78% reported improvement in psychological symptoms, and 80% reported improvement in quality of life.<sup>45</sup> None of the studies included the bias-limiting measure of randomization (that is, in

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<sup>42</sup> Annette Kuhn *et al.*, “Quality of life 15 years after sex reassignment surgery for transsexualism,” *Fertility and Sterility* 92, no. 5 (2009): 1685–1689, <http://dx.doi.org/10.1016/j.fertnstert.2008.08.126>.

<sup>43</sup> Mohammad Hassan Murad *et al.*, “Hormonal therapy and sex reassignment: a systematic review and meta-analysis of quality of life and psychosocial outcomes,” *Clinical Endocrinology*, 72 (2010): 214–231. <http://dx.doi.org/10.1111/j.1365-2265.2009.03625.x>.

<sup>44</sup> *Ibid.*, 215

<sup>45</sup> 95% confidence intervals: 68–89%, 56–94%, and 72–88%, respectively.

none of the studies were sex-reassignment procedures assigned randomly to some patients but not to others), and only three of the studies included control groups (that is, patients who were not provided the treatment to serve as comparison cases for those who did).<sup>46</sup> Most of the studies examined in Murad and colleagues' review reported improvements in psychiatric comorbidities and quality of life, though notably suicide rates remained higher for individuals who had received hormone treatments than for the general population, despite reductions in suicide rates following the treatments.<sup>47</sup> The authors also found that there were some exceptions to reports of improvements in mental health and satisfaction with sex-reassignment procedures; in one study, 3 of 17 individuals regretted the procedure with 2 of these 3 seeking reversal procedures,<sup>48</sup> and four of the studies reviewed reported worsening quality of life, including continuing social isolation, lack of improvement in social relationships, and dependence on government welfare programs.<sup>49</sup>

99. The scientific evidence suggests we take a skeptical view toward the claim that sex-reassignment procedures provide the hoped-for benefits or resolve the underlying issues that contribute to elevated mental health risks among the transgender population. While we work to stop maltreatment and misunderstanding, we should also work to study and understand whatever factors may contribute to the high rates of suicide and other psychological and behavioral health problems among the transgender population, and to think more clearly about the treatment options that are available. Critiquing and challenging the notion that there is a fixed gender independent of biological sex enables us to ask important questions

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<sup>46</sup> *Ibid.*

<sup>47</sup> *Ibid.*, 216

<sup>48</sup> *Ibid.*

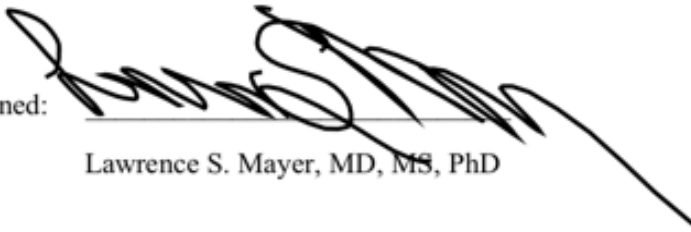
<sup>49</sup> *Ibid.*, 228

about sexuality, sexual behaviors, gender, and individual and social goods in a different light. Thoughtful scientific research and careful, circumspect interpretation of its results can advance our understanding of sexual gender identity. There is still much work to be done and many unanswered questions.

100. I reserve the right to expand on this declaration if given additional evidence or given additional testimony of other witnesses to review

101. Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

Signed:

A handwritten signature in black ink, appearing to read 'Lawrence S. Mayer', written over a horizontal line.

Lawrence S. Mayer, MD, MS, PhD

Date: August 12, 2016

## References

- <sup>i</sup> For one recent review of the science of neurological sex differences, see Amber N.V. Ruigrok *et al.*, “A meta-analysis of sex differences in human brain structure,” *Neuroscience Biobehavioral Review* 39 (2014): 34–50, <http://dx.doi.org/10.1016%2Fj.neubiorev.2013.12.004>.
- <sup>iii</sup> Robert Sapolsky, “Caught Between Male and Female,” *Wall Street Journal*, December 6, 2013, <http://www.wsj.com/articles/SB10001424052702304854804579234030532617704>.
- <sup>iv</sup> *Ibid.*
- <sup>v</sup> *Ibid.*
- <sup>vi</sup> For some examples of popular interest in this view, see Francine Russo, “Transgender Kids,” *Scientific American Mind* 27, no. 1 (2016): 26–35, <http://dx.doi.org/10.1038/scientificamericanmind0116-26>; Jessica Hamzelou, “Transsexual differences caught on brain scan,” *New Scientist* 209, no. 2796 (2011): 1, <https://www.newscientist.com/article/dn20032-transsexual-differences-caught-on-brain-scan/>; Brynn Tannehill, “Do Your Homework, Dr. Ablow,” *The Huffington Post*, January 17, 2014, [http://www.huffingtonpost.com/brynn-tannehill/how-much-evidence-does-it\\_b\\_4616722.html](http://www.huffingtonpost.com/brynn-tannehill/how-much-evidence-does-it_b_4616722.html).
- <sup>vii</sup> Nancy Segal, “Two Monozygotic Twin Pairs Discordant for Female-to-Male Transsexualism,” *Archives of Sexual Behavior* 35, no. 3 (2006): 347–358, <http://dx.doi.org/10.1007/s10508-006-9037-3>.
- <sup>viii</sup> Holly Devor, “Transsexualism, Dissociation, and Child Abuse: An Initial Discussion Based on Nonclinical Data,” *Journal of Psychology and Human Sexuality*, 6 no. 3 (1994): 49–72, [http://dx.doi.org/10.1300/J056v06n03\\_04](http://dx.doi.org/10.1300/J056v06n03_04).
- <sup>ix</sup> Segal, “Two Monozygotic Twin Pairs Discordant for Female-to-Male Transsexualism,” 350.
- <sup>x</sup> *Ibid.*, 351.
- <sup>xi</sup> *Ibid.*, 353–354.
- <sup>xii</sup> *Ibid.*, 354.
- <sup>xiii</sup> *Ibid.*, 356.
- <sup>xiv</sup> *Ibid.*, 355. Emphasis in original.
- <sup>xv</sup> J. Michael Bostwick and Kari A. Martin, “A Man’s Brain in an Ambiguous Body: A Case of Mistaken Gender Identity,” *American Journal of Psychiatry*, 164 no. 10 (2007): 1499–1505, <http://dx.doi.org/10.1176/appi.ajp.2007.07040587>.
- <sup>xvi</sup> *Ibid.*, 1500.
- <sup>xvii</sup> *Ibid.*, 1504.
- <sup>xviii</sup> *Ibid.*, 1504.
- <sup>xix</sup> *Ibid.*, 1503–1504.
- <sup>xx</sup> Giuseppina Rametti *et al.*, “White matter microstructure in female to male transsexuals before cross-sex hormonal treatment. A diffusion tensor imaging study,” *Journal of Psychiatric Research* 45, no. 2 (2011): 199–204, <http://dx.doi.org/10.1016/j.jpsychires.2010.05.006>.
- <sup>xxi</sup> *Ibid.*, 202.
- <sup>xxii</sup> Giuseppina Rametti *et al.*, “The microstructure of white matter in male to female transsexuals before cross-sex hormonal treatment. A DTI study,” *Journal of Psychiatric Research* 45, no. 7 (2011): 949–954, <http://dx.doi.org/10.1016/j.jpsychires.2010.11.007>.
- <sup>xxiii</sup> *Ibid.*, 952.
- <sup>xxiv</sup> *Ibid.*, 951.

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<sup>xxv</sup> Emiliano Santarnecchi *et al.*, “Intrinsic Cerebral Connectivity Analysis in an Untreated Female-to-Male Transsexual Subject: A First Attempt Using Resting-State fMRI,” *Neuroendocrinology* 96, no. 3 (2012): 188–193, <http://dx.doi.org/10.1159/000342001>.

<sup>xxvi</sup> *Ibid.*, 188.

<sup>xxvii</sup> Hsaio-Lun Ku *et al.*, “Brain Signature Characterizing the Body-Brain-Mind Axis of Transsexuals,” *PLOS ONE* 8, no. 7 (2013): e70808, <http://dx.doi.org/10.1371/journal.pone.0070808>.

<sup>xxviii</sup> *Ibid.*, 2.

<sup>xxix</sup> Hans Berglund *et al.*, “Male-to-Female Transsexuals Show Sex-Atypical Hypothalamus Activation When Smelling Odorous Steroids,” *Cerebral Cortex* 18, no. 8 (2008): 1900–1908, <http://dx.doi.org/10.1093/cercor/bhm216>.

<sup>xxxi</sup> An additional clarification may be helpful with regard to research studies of this kind. Significant differences in the means of sample populations do not entail predictive power of any consequence. Suppose that we made 100 different types of brain measurements in cohorts of transgender and non-transgender individuals, and then calculated the means of each of those 100 variables for both cohorts. Statistical theory tells us that, due to mere chance, we can (on average) expect the two cohorts to differ significantly in the means of 5 of those 100 variables. This implies that if the significant differences are about 5 or fewer out of 100, these differences could easily be by chance and therefore we should not ignore the fact that 95 other measurements failed to find significant differences.

<sup>xxxii</sup> One recent paper estimates that 0.6% of the adult U.S. population is transgender. See Andrew R. Flores *et al.*, “How Many Adults Identify as Transgender in the United States?” (white paper), Williams Institute, UCLA School of Law, June 30, 2016, <http://williamsinstitute.law.ucla.edu/wp-content/uploads/How-Many-Adults-Identify-as-Transgender-in-the-United-States.pdf>.

## **LAWRENCE S. MAYER, MD, MS, PhD**

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Chair, Division of Research, Medical Professionals of Arizona, Phoenix, 2003-2006

Director of Research, Maricopa Integrated Health System, 2003-2006

System Director, Research and Director of the Banner Health Research Institute, Banner Health System, Phoenix, 2001-2003

Director Good Samaritan Research Institute, 2001-2003

Consultant in Biostatistics, Good Samaritan Medical Center, 1993-2001

Thesis Advisor, Masters in Public Health, School of Public Health, University of Arizona, 1996-

Member, Committee on Statistics, Graduate College, Arizona State University, 1989-2004

Member, Program on Law and the Social Sciences, Arizona State University, 1983-2004

Member, Committee on Malpractice Reform, Arizona Supreme Court, 1989-1993

Erskine Fellow, Occupational Medicine, University of Canterbury, Christchurch, New Zealand, 1989-90

Visiting Scholar, Department of Statistics, Stanford University, Summer Semesters, 1984-1988

Instructor, Summer Program, Inter-University Consortium for Political and Social Research, Institute for Social Research, University of Michigan, 1971-1980

Game and Fish Officer (Fully Sworn), State of Arizona, 1983-1998

**Journal Articles:**

Samus QM, Onyike CU, Johnston D, Mayer L, McNabney M, Baker AS, Brandt J, Rabins PV, Lyketsos CG, Rosenblatt A. 12-month incidence, prevalence, persistence, and treatment of mental disorders among individuals recently admitted to assisted living facilities in Maryland. *Int Psychogeriatr*. 2013 May;25(5):721-31

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Ramsey CM, Leoutsakos JM, Mayer LS, Eaton WW, Lee HB (2010) History of manic and hypomanic episodes and risk of incident cardiovascular disease: 11.5 year follow-up from the Baltimore Epidemiologic Catchment Area Study. *J Affective Disord*. Sep;125(1-3):35-41.

Samus QM, Rosenblatt A, Steele C, Baker A, Harper M, Brandt J, Mayer, LS, Rabins PV, and Lyketsos CG (2009) The Impact of Neuropsychiatric Symptoms and Environmental Characteristics on Quality of Life in Assisted Living Residents with Dementia. Journal of the American Geriatric Society (in press)

Samus QM, Mayer L, Onyike CU, Brandt J, Baker A, McNabney M, Rabins PV, Lyketsos CG, Rosenblatt A. (2009) Correlates Of Functional Dependence Among Recently Admitted Assisted Living Residents With And Without Dementia. J Am Med Dir Assoc. Jun;10(5):323-9.

Hayden KM, Zandi PP, West NA, Tschanz JT, Norton MC, Corcoran C, Breitner JC, Welsh-Bohmer KA; Cache County Study Group. Effects of family history and apolipoprotein E epsilon4 status on cognitive decline in the absence of Alzheimer dementia: the Cache County Study. Arch Neurol. 2009 Nov;66(11):1378-83.

Welsh-Bohmer KA, Ostbye T, Sanders L, Pieper CF, Hayden KM, Tschanz JT, ..., Mayer L, ... (2009) Neuropsychological performance in advanced age: influences of demographic factors and Apolipoprotein E: findings from the Cache County Memory Study. Clin Neuropsychol 2009 Jan;23(1):77-99. Epub 2008 Jun 10.

Samus QM, Mayer L, Baker A, McNabney M, Brandt J, Onyike CU, Rabins PV, Lyketsos CG, Rosenblatt A. (2008) Characteristics And Outcomes For Assisted Living Residents With Dementia: Comparing Dementia-Specific Care Units With Non-Dementia-Specific Care Units. Journal of the American Geriatric Society. July;56(7)1361-3

Rao V, Spiro J, Samus QM, Steele C, Baker A, Brandt J, Mayer L, Lyketsos CG, Rosenblatt A. (2008) Insomnia And Daytime Sleepiness In People With Dementia Residing In Assisted Living: Findings From The Maryland Assisted Living Study. Int J Geriatr Psychiatry. Feb(23)199-206

Rosenblatt A, Samus QM, Onyike CU, Baker AS, McNabney M, Mayer LS, Brandt J, Lyketsos CG. (2008) Acetylcholinesterase Inhibitors In Assisted Living: Patterns Of Use And Association With Retention. Int J Geriatr Psychiatry. 2008 Feb;23(2):178-84.

Tighe SK, Leoutsakos JM, C Carlson M, Onyike CU, Samus Q, Baker A, Brandt J, Rabins PV, Mayer L, Rosenblatt A, Lyketsos CG. (2008) The Association Between Activity Participation And Time To Discharge In The Assisted Living Setting. Int J Geriatr Psychiatry. Jun;23(6):586-91

Steinberg M, Shao H, Zandi P, Lyketsos CG, Welsh-Bohmer KA, Norton MC, Breitner JC, Steffens DC, Tschanz JT...Mayer, L....(2008) Point and 5-year period prevalence of neuropsychiatric symptoms in dementia: the Cache County Study Int J Geriatr Psychiatry. 2008 Feb;23(2):170-7.

Lyketsos CG, Samus QM, Baker A, McNabney M, Onyike CU, Mayer LS, Brandt J, Rabins P, Rosenblatt A. (2007) Effect Of Dementia And Treatment Of Dementia On Time To Discharge From Assisted Living Facilities: The Maryland Assisted Living Study. J Am Geriatr Soc;55(7):1031-7

Mayer LS, Bay RC, Politis A, Steinberg M, Steele C, Baker AS, Rabins PV, Lyketsos CG. Comparison Of Three Rating Scales As Outcome Measures For Treatment Trials Of Depression In Alzheimer Disease: Findings From DIADS (2006) Int J Geriatr Psychiatry. Oct;21(10):930-6

Maust DT, Onyike CU, Sheppard JM, Mayer LS, Samus QM, Brandt J, Rabins PV, Lyketsos CG, Rosenblatt A. (2006) Predictors Of Caregiver Unawareness And Nontreatment Of Dementia Among Residents Of Assisted Living Facilities: The Maryland Assisted Living Study. Am J Geriatr Psychiatry.

2006 Aug;14(8):668-75

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Samus, Quincy M., Rosenblatt, Adam, Onyike, Chiadi, Steele, Cynthia, Baker, Alva, Harper, Michael, Brandt, Jason, Mayer, Lawrence, Rabins, Peter V., Lyketsos, Constantine G. (2006) Correlates of Caregiver-Rated Quality of Life in Assisted Living: The Maryland Assisted Living Study J Gerontol B Psychol Sci Soc Sci 2006 61: P311-314

Maust, Donovan T., Onyike, Chiadi U., Sheppard, Jeannie-Marie E., Mayer, Lawrence S., Samus, Quincy M., Brandt, Jason, Rabins, Peter V., Lyketsos, Constantine G., Rosenblatt, Adam (2006) Predictors of Caregiver Unawareness and Nontreatment of Dementia Among Residents of Assisted Living Facilities: The Maryland Assisted Living Study Am. J. Geriatr. Psychiatry. 14: 668-675

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Rao V, Spiro JR, Samus QM, Rosenblatt A, Steele C, Baker A, Harper M, Brandt J, Mayer L, Rabins PV, Lyketsos CG. (2005) Sleep disturbances in the elderly residing in assisted living: findings from the Maryland Assisted Living Study Int J Geriatr Psychiatry. 2005 Oct;20(10):956-66

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Zandi, P. Carlson, C., Plassman, B., Welsh-Bolmer, K., Mayer, L., Steffens, D., and Breitner, J. (2002) Hormone Replacement Therapy and the Incidence of Alzheimer Disease in Older Women: The Cache County Study, Journal of the American Medical Association, 288 (17), November, 2123-2129

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Kellam, S., Mayer, L., Rebok, G. and Hawkins, W. (1996) "The Effects of Improving Achievement on Aggressive Behavior and of Improving Aggressive Behavior on Achievement Through Two Preventive Interventions: An Investigation of Causal Paths", in Dohrenwend (ed.) Adversity, Stress and Psychopathology, American Psychiatric Press, American Psychiatric Association, [a refereed journal published as a monograph series]

Kellam, S., Rebok G., Mayer, L., Ialongo, N. and Kalodner, C. (1994) "Depressive Symptoms Over First Grade and Their Response to a Developmental Epidemiologically Based Preventive Trial Aimed at Improving Achievement" , Development and Psychopathology, 6, 463-481

Kellam, S.G., Rebok, G.W., Wilson, R. and Mayer, L.S.(1994) "The Social Field of the Classroom: Context for the Developmental Epidemiological Study of Aggressive Behavior", in Adolescence in Context: The Interplay of Family, School, Peers, and Work in Adjustment, Silbereisen, R. K. and Todt, E. (eds), New York: Springer-Verlag, 390-408

Kellam, S., Rebok G., Ialongo, N., and Mayer, L. (1994) "The Course and Malleability of Aggressive Behavior from Early First Grade Into Middle School: Results of a Developmental Epidemiological Based Preventive Trial", The Journal of Child Psychology and Psychiatry, 35(2), 259-281

Mayer, L. S. (1994) "On Cross-Lagged Panel Studies with Serially Correlated Errors," Frontiers in Econometrics, G. Maddala (ed), Springer-Verlag, 336-345

Dolan, L. J., Kellam, S. G., Brown, C. H., Werthamer-Larson, L., Rebok, G. W., Mayer, L. S., Laudoff, J. and Turkkan, J. S.(1993) "The Short-term Impact of Two Classroom-based Preventive Interventions on Aggressive and Shy Behaviors and Poor Achievement", Journal of Applied Developmental Psychology, 14, 317-345

Kellam, S. G., Werthamer-Larson, L., Dolan, L. J., Brown, C. H., Mayer, L. S., Rebok, G. R., Anthony, J. C., Laudoff, J. and Edelson, G.(1991) "Developmental Epidemiologically Based Preventive Trials: Baseline Modelling of Early Target Behaviors and Depressive Symptoms", American Journal of Community Psychology, 19, 563-584

Rebok, G.R., Kellam, S. G., Dolan, L. J., Werthamer-Larsson, L., Edwards, E. J., and Mayer, L. S., and Brown, G.H. (1991) "Preventing Early Risk Behavior: Process Issues and Problem Areas in Prevention Research", The Community Psychologist, 24, 18-21

Mayer, L.S. and Carroll, S.S. (1991) "Modeling the Contemporaneous Relationship in a Continuous Variable Panel Model", Communications in Statistics, 17, 463-477

Mayer, L.S. and Carroll, S.S. (1988) "Measures of Dependence for Cross-Lagged Panel Models," Sociological Methods and Research, 17(1) August, 248-260

Mayer, L.S. and Carroll, S.S. (1987) "Testing for Homogeneity in Cross-Lagged Panel Studies," Communications in Statistics, 16(9), 2487-2510

Mayer, L.S. and Carroll, S.S. (1987) "Testing for Lagged, Cotemporal, and Total Dependence in Cross-Lagged Panel Analysis," Sociological Methods and Research, 16(2), 187-217

Mayer, L.S. (1986) "Statistical Inferences for Cross-Lagged Panel Models Without the Assumption of Normal Errors," Social Science Research, 15, 28-42

Mayer, L.S. and Carroll, S.S. (1986) "Detecting Serial Correlation in the Error Structure of a Cross-Lagged Panel Model," Communications in Statistics, 15, 347-366

Carroll, S.S. and Mayer, L.S. (1986) "Analysis of the Cross-Effects in a Cross-Lagged Panel Study," Communication in Statistics, 15, 3361-3395

Mayer, L.S. (1986) "On Cross-Lagged Panel Studies with Serially Correlated Errors," Journal of Business and Economic Statistics, 4, 347-357

Mayer, L.S. (1981). "A Comment on 'Estimating Volumes of Remaining Fossil Fuel Resources'," Journal of the American Statistical Association, 76, 551-554

Mayer, L.S. and Horowitz, C.E. (1979). "The Effect of Price on the Residential Demand for Electricity: A Statistical Study," Energy, 4, 87-99

Mayer, L.S. (1978). "Estimating the Effects of the Onset of the Energy Crisis on Residential Energy Demand," Resource and Energy, 1, 57-92

Mayer, L.S. and Benjamin, Y. (1978). "Modeling Residential Demand for Natural Gas as a Function of the Coldness of the Month," Energy and Buildings, 1, 301-312

Mayer, L.S., Hoyer, R.W., and Bernd, J.L. (1977). "Some Problems in the Validation of Mathematical and Stochastic Models of Political Phenomena: The Case of the Supreme Court," American Journal of Political Science, 21, 381-403

Mayer, L.S. and Younger, M.S. (1976). "Estimation of Standardized Regression Coefficients," Journal of the American Statistical Association, 71, 154-157

Mayer, L.S. and Robinson, J.A. (1977). "Measures of Association for Multiple Regression Models with Ordinal Predictor Variables," Sociological Methodology, 1978, Jossey-Bass, 141-162

Jensen, D.R. and Mayer, L.S. (1977). "Some Variational Results and Their Applications to Problems in Multiple Inference," Annals of Statistics, 5, 922-931

Horowitz, C.E. and Mayer, L.S. (1977). "The Relationship Between the Price and Demand for Natural Gas: A Partially Controlled Study," Energy Research, 1, 193-222

Hoyer, R.W. and Mayer, L.S. (1976). "On Electoral Equilibria in a Spatial Analysis Based on the Theory of Games," Journal of Politics, 38, 116-171

Hoyer, R.W. and Mayer, L.S. (1975). "On Social Preference Orderings Under Majority Rule," Econometrica, 43, 803-806

Mayer, L.S., and Good, I.J. (1975). "Is Minimax Regret Applicable to Voting Decisions?" American Political Science Review, 69, 916-917

Good, I.J. and Mayer, L.S. (1975). "Estimating the Efficacy of a Vote," Behavioral Science, 20, January, 25-33

Mayer, L.S. and Younger, M.S. (1975). "Multiple Indicators and the Relationship Between Abstract Variables," Sociological Methodology, 1975, 191-211

Jensen, D.R. and Mayer, L.S. (1975). "Normal-Theory Approximations to Tests for Linear Hypotheses," Annals of Statistics, 3, 429-444

Jensen, D.R., Mayer, L.S. and Myers, R.H. (1975). "Optimal Designs and Large-Sample Tests for Linear Hypotheses," Biometrika, 62, 71-78

Hoyer, R.W. and Mayer, L.S. (1974). "Comparing Strategies in a Spatial Model of Electoral Competition," American Journal of Political Science, 18, 501-523

Bush, W. and Mayer, L.S. (1974). "Some Implications of Anarchy for the Distribution of Property," Journal of Economic Theory, 4, 401-411

Mayer, L.S., Singh, J. and Willke, T.A. (1974). "Utilizing Initial Estimates in Estimating the Coefficients in a Linear Model," Journal of the American Statistical Association, 69, 219-222

Mayer, L.S. and Younger, M.S. (1974). "Procedures for Estimating Standardized Regression Coefficients from Sample Data," Sociological Methods and Research, 1, 431-453

Mayer, L.S. and Good, I.J. (1974). "On Ordinal Prediction Problems," Social Forces, 52 (4), 543-549

Mayer, L.S. (1974). "On the Use of Non-Random Exogenous Variables in Path Analysis," American Sociological Review, 39, 891-893

Klemmack, D.L., Leggette, T.A. and Mayer, L.S. (1973). "Non-Random Exogenous Variables in Path Analysis," American Sociological Review, 38 (December), 778-784

Mayer, L.S. and Hendrickson, A. (1973). "A Method for Constructing an Optimal Regression Design After an Initial Set of Input Values Has Been Selected," Communications in Statistics, 2(5), 465-477

Mayer, L.S. and Willke, T.A. (1973). "On Biased Estimation in Linear Models," Technometrics, 15, 497-508

Mayer, L.S. (1973). "Estimating a Correlation Coefficient When One Variable is Not Directly

Observed," Journal of the American Statistical Association, 68, 420-421

Burgess, P.M. and Mayer, L.S. (1973). "Simulation and Society, A Review Essay," Journal of Regional Science, 12, 303-311

Good, I.J. and Mayer, L.S. (1973). "On Surfaces of Constant Societal Loss in a Model of Social Choice," Journal of Mathematical Sociology, 2, 209-219

Mayer, L.S. (1972). "Using Monotone Regression to Estimate a Correlation Coefficient," Sociological Methodology, (Herbert Costner, ed.), Jossey-Bass: San Francisco, 200-212

Mayer, L.S. (1972). "An Analysis of Measures of Crosscutting and Fragmentation," Comparative Politics, 4, 405-415

Mayer, L.S. (1971). "Comment on 'The Assignment of Numbers to Rank Order Categories'," American Sociological Review, 35, 916-917

Mayer, L.S. (1971). "A Note on Treating Ordinal Data as Interval Data," American Sociological Review, 36, 519-520

Mayer, L.S. (1971). "A Note on An Axiomatic Model of Voting Bodies," American Political Science Review, 65, 764-65

Mayer, L.S. (1971). "A Method of Cluster Analysis When There Exists Multiple Indicators of a Theoretic Concept," Biometrics, 27, 143-155

Mayer, L.S. (1971). "A Comment on 'A Theorem on Voting'," American Political Science Review, 65, 779-780

#### **Research Monographs:**

Energy Consumption Measurement: Data Needs for Public Policy, (1977) Committee on Measurement of Energy Consumption, Washington: National Academy of Science

Mayer, L.S. (1976). An Analysis of Alternative Voter Registration Systems, Modules in Applied Mathematics, Washington: Mathematical Association of America

#### **Chapters in Research Monographs:**

Mayer, L. S. (1994) "On Cross-Lagged Panel Studies with Serially Correlated Errors," Frontiers in Econometrics, G. Maddala (ed), 154-165

Mayer, L.S. (1980). "The Effects of Price on Energy Demand: Econometrics Versus Exploratory Data Analysis," in Evaluation of Econometric Models (J. Kmenta and J. Ramsey, eds.), Academic Press, 15-45

Mayer, L.S. and Benjamin, Y. (1980). "Modelling Residential Demand for Natural Gas as a Function of the Coldness of the Month," in Saving Energy in the Home, (R. Socolow, ed.) New York: Ballinger

Bush, W. and Mayer, L.S. (1976). "On the Economics of Human Fertility," in Essays on Unorthodox Economic Strategies: Anarchy, Politics and Population, (A.T. Denzau and R.J. Mackay, eds.), University Publications, 163-181

Mayer, L.S. (1974). "Optimal Voting Behavior in a Two-Party Primary", in Applications of Mathematics in Political Science, Vol. VIII, (J. Herndon and J. Bernd, eds.), Charlottesville: University of Virginia Press, 4-14

### **Published Book Reviews**

On the Verge: The Legal Fight of Travellers in England for their Rights (many authors), Romani Studies, 2001, 144-146

Firms and Markets (C. Tucker and R. Fuller, eds.), Perspective, Winter, 1988, 41

Social Science and Social Policy (R. Shotland and M. Mark, eds.), Perspective, April, 1986, 60

Principles of Epidemiology (Kleinbaum, Kupper and Morgenstern) Journal of the American Statistical Association, July/August 1984, 108

U.S. Interests and Global Natural Resources (Castle and Price, eds.), Perspective, September, 1984, 725-726

Proximity and Preference: Problems in the Multidimensional Analysis of Large Data Sets (R. Golledge and J. Raynor, eds.), Journal of the American Statistical Association, September, 1983, 78, 734

Statistical Applications in the Spatial Sciences (N. Wrigley, ed.), Journal of the American Statistical Association, June, 1983, 78, 509-510

Power, Voting, and Voting Power (Manfred J. Holler, ed.), Perspective, February, 1983

Exploratory Data Analysis (J. Tukey), Evaluation and Program Planning, 1981, 4, 195-196

On the Social Use of Information (A. Wissel), Perspective, June, 1977, Vol. 6, No. 5

Simulation Model Building: A Statistical Approach to Modeling in the Social Sciences With The Simulation Method (U. Norlen), Perspective, March 1977, Vol. 6, No. 2

Research Methods in the Social Sciences (D. Nachimas and C. Nachimas), Perspective, November 1976, Vol. 5, No. 9

Registering Voters by Mail: The Maryland and New Jersey Experience (R. Smolka), Perspective, October 1975, Vol. 4, No. 8

### **Other Professional Activities:**

Guest Lecture, Statistics and Epidemiology in Court, University of Maryland Law School, March, 2012

Editorial Board Member, Journal of Cardiology Research, 2003-

Member, Development Board, Copper Ridge Institute, Sykesville, MD, 1998-2000

Member, Expert Panel, Sexually Transmitted Disease and Teens, W. T. Grant Foundation, 2000-2001



Advisor, Sexually Transmitted Diseases & the Internet, American Social Health Association, 2000-2001

Invited Member, Panel on Mental Health Problems of Asylum Seekers, University of Greenwich, July 2000

Invited participant, Expert Panel on Mortality Associated with Alternative Fuels, Department of Energy, Carmel, May, 2000

Chief, Epidemiology and Biostatistics Branch, Phoenix Integrated Residency in Cardiology, 1999-

Clinical Professor, Prevention Center, College of Medicine, University of Arizona, 1999-

Member, Faculty of the Psychiatry Residency Program, Good Samaritan, 1998 –

Member of the Board of Directors, Palms Clinic, Phoenix, 1998-

Invited Participant, US Environmental Protection Agency Expert Panel on Cryptosporidium, October, 1998

Member, Evaluation Panel, Graduate Programs, University of Greenwich, London, August, 1998

Expert Witness, Appropriations Hearing on NIH Budget, US Senate, October, 1997-

Member, Expert Review Committee on Grant Applications and Awards, Health Care and Promotion Fund, Hong Kong, 1996-1998

Member, Clinical Committee, Health Services Advisory Group, Arizona, [the arm of the Medicare system that advises Medicare on reimbursements], 1994-1996

Alternate Member, Institutional Review Board, Samaritan Health Systems 1994-2001

Invited Attendee, Workshop on Psychosocial Research, American Psychiatric Association, Massachusetts General Hospital, Boston, October, 1996

Invited Attendee, Risk Estimation Conference, Environmental Protection Agency, Durham, North Carolina, September, 1996

Invited Attendee, Society for Prevention Research, Annual Conference, Puerto Rico, May, 1996

Proposal Evaluation Site Visit, Raptor Research Center, Boise State University, March 1996

Workshop Attendee, The Epidemiology of Avian Mortality, California Energy Commission, Sacramento, California, January, 1996

Invited Attendee, Prevention Science and Methodology Conference, Baltimore, MD, October, 1995

Invited Attendee, Avian Windpower Planning Meeting, Palm Springs, September, 1995

Invited Attendee, US Department of Energy Course on Risk Assessment, Boulder, July 1995

Invited Attendee, Mini-conference on Measuring Health Outcomes, Phoenix, March 1995

Invited Attendee, Private Conference on Wind Energy Research, California Energy Commission,

Grand Island, California, December, 1994

Invited Participant, Workshop on Prevention Methodology, University of South Florida, Baltimore, December, 1994

Invited Participant, National Conference on Prevention Research, Washington, DC, December, 1994

Invited Consultant, California Energy Commission, Flagstaff, Arizona, November, 1994

Invited Participant, Workshop on the Science of Prevention, NIMH, Baltimore, December, 1994

Invited Participant, Meeting on Renewable Energy, California Energy Commission, Flagstaff, Arizona, November, 1994

Invited Participant, Workshop on Prevention Methodology, Oregon Social Learning Center, Eugene Oregon, August, 1994

Invited Technical Advisor, National Planning Meeting on Wind Power and Avian Mortality, Lakewood, CO, July, 1994

Invited Participant, Workshop on Biostatistical Methods in Preventive Mental Health Research, College of Public Health, University of South Florida, Tampa, March, 1994

Invited Participant, Biomedical Effects of Renewable Energy, Invited Conference, US Department of Energy, Washington, DC February, 1994

Member, Special Study Section, National Institute of Health, 1993-

Invited Participant, Avian Mortality Taskforce Meeting, October, Pleasonton, CA, December, 1993

Invited Participant, Conference on Avian Mortality and Wind Energy, Pacific Gas and Electric, Livermore, CA, October, 1993

Invited Participant, Prevention Center Directors Meeting, National Institute of Mental Health, Tysons Corner, September, 1993

Invited Participant, National Conference on Prevention Research, McLean, Virginia, April, 1993.

Invited Participant, Prevention Center Directors Meeting, National Institute of Mental Health, Rockville, September, 1992

Invited Participant, Prevention Center Directors Meeting, National Institute of Mental Health, Rockville, September, 1991

Invited Participant, Conference on the Future of Prevention Research, National Institute of Mental Health, Washington, DC, July, 1991

Invited Participant, Workshop on Development of Delinquency, National Academy of Science, Woods Hole Study Center, July, 1991

Invited Participant, Workshop on Preventive Research, National Institute of Mental Health, October, 1990

Invited Lecturer, Exploratory Data Analysis, The Bootstrap and Panel Models in Occupational Medicine, lecture series, College of Business Administration, University of Canterbury, Christchurch, New Zealand, September - October, 1989

Invited Host, Mini-conference on The Epidemiology of Bladder Cancer, August, 1988, Lenox, Massachusetts

Expert Witness, Department of Public Health, Commonwealth of Massachusetts, July, 1988

Expert Witness, Department of Labor and Industry, Commonwealth of Massachusetts, July, 1988

Invited Participant, Workshop in Multidimensional Analysis, Information Theory and Asymptotic Methods, Stanford University, July 1983

Assisted in Preparation and Coordination, Conference on Science and Technology in the Soviet Union, Stanford University, July, 1983

Session Organizer, International Conference on Energy Use Management, Berlin, October, 1981

Member, Committee on Industrial Use of Solar Energy, Solar Energy Research Institute, Golden, Colorado, 1979-1981

Press Conference on Wharton's Support to Litigation Project Award, April, 1981, Philadelphia

Invited Participant, Workshop on Model Validation, Department of Economics, New York University, April, 1980.

Expert Witness, Hearings on Energy Tax Exemptions, Energy Committee, Pennsylvania State Assembly, April, 1980

Lecturer, Workshop in Environmental Policy, Florida Atlantic University, March, 1980

Interviewed on Feasibility of Philadelphia's Refinery Tax Proposal, WUSL Radio, Philadelphia, November, 1980

Member, Committee on Health Manpower Training, Department of Health, New Jersey, 1976-79.

Interviewed on Model Validation, WPEN Radio, Philadelphia, November, 1979.

Interviewed on Value of Energy Forecasts, Philadelphia Inquirer, October, 1979.

Invited Panelist, Panel on Energy Models in Energy Policy-making, Program in Science Technology and Public Policy, George Washington University, Washington, D.C., October, 1979

Organizer, Workshop on Resource Estimation, Department of Energy Statistical Symposium, Gatlinburg, Tennessee, October, 1979

Session Chairperson, Special Topics Meetings on Regression, Institute of Mathematical Statistics, October, 1979

Invited Participant, Workshop on the Measurement and Interpretation of Model Confidence, National Bureau of Standards, U.S. Department of Commerce, Washington, D.C., October, 1979

Invited Participant, Workshop on Measuring Model Confidence, National Bureau of Standards, Gaithersburg, MD, October 1979

Expert Witness, Hearings on State Health Benefits, Ohio State Assembly, February, 1979

Member, Committee on Model Evaluation, General Accounting Office, United States Congress, 1977-1978.

Participant, Workshop on Assessment of Energy Models, Massachusetts Institute of Technology, October, 1978.

Organizer, Session on Multivariate Statistics, Annual Meeting, Institute of Mathematical Statistics, August, 1978

Lecturer, Program on Environmental Management, Florida Atlantic University, April, 1978

Expert Witness, Hearings on Local Energy Policies, Subcommittee on Energy and Power, Committee on Interstate and Foreign Commerce, U.S. House of Representatives, May, 1978

Invited Panelist, Policy Workshop on Energy Policy, Swarthmore College, March, 1978

Chairperson, Committee on Membership, Institute of Mathematical Statistics, 1974-78

Invited Participant, Workshop on Energy Information, Stanford University, December 1977

Invited Participant, Conference on Criteria for Evaluation of Econometric Models, University of Michigan, June 1977

Expert Witness, Hearings on Health Impacts of Energy Conservation, Commerce Committee, US House Representatives, April, 1977

Conference Chair, Conference on the Analysis of Large Data Sets, Institute of Mathematical Statistics and American Statistical Association, Dallas, February 1977

Panelist, Seminars on Models and Energy Policy, Program in Public Policy, George Washington University, February, 1977

Invited Participant, Workshop on Stochastic Models of Social Structure Carnegie-Mellon University, MSSB Workshop, Pittsburgh, December, 1977

Interviewed on Energy Policy, West Virginia Public Television Network, October, 1976

Member, Committee on Measurement of Energy Consumption, National Academy of Sciences, 1975-76

Interviewed on Energy Policy, West Virginia Public Television Network, October, 1976

Participant, Workshop on Model Building, Mathematical Association of America, Cornell University, August, 1976

Organizer and Chair, Session on Voting Models, Annual Meeting of the Public Choice Society, Roanoke, VA, April, 1976

Instructor, Short Course on Advances in Data Analysis, Princeton University, April, 1976

Member, Organizing Committee, Annual Convention, Institute of Mathematical Statistics, 1975-76

Member, Site Review Committee, University of Texas, San Antonio, National Science Foundation, 1975

Participant, Workshop on Validation of Econometric Models, National Science Foundation, Vail, Colorado, June, 1975

Participant, Workshop on Decentralization Theory, National Science Foundation, Princeton University, March, 1975

Member of the Council, Polymetrics Section, International Studies Association, 1973-75

Member, Committee on Education of Gifted Children, Department of Education, Virginia, 1973-74

Member, Committee on Health Training, State Council of Higher Education, Virginia, 1973-74

Instructor, Workshop on Survey Research, University of Cologne, Cologne, West Germany, 1973

Lecturer, Institute on Model Building, National Science Foundation, Blacksburg, Virginia, August, 1973

Clinical Assistant [Clinical Rotations], Associated Medical Schools, British Virgin Islands, 1969-1970

Summer Fellow, College of Medicine, University of Michigan, Summer, 1970

**Major Consulting Appointments (Other than Public and Non-profit):**

Play an active advisory role to several CEO's, corporate medical directors, courts, boards, and non-profits on specific health issues, which are confidential, private, proprietary or privileged. I would be glad to discuss these activities in an executive session. They are not appropriate for open documentation.

**Major Consulting Appointments (Public and Non-profit):**

Consultant in Research Compliance, Maricopa Integrated Medical System, 2002-2003

Consultant, California Energy Commission, 1994-2002

Consultant, National Renewable Energy Laboratory, 1992-1996

Consultant, Department of Mental Hygiene, Johns Hopkins Medical Institutions, June-August, 1990-1993

Consultant, Program on Delinquency, Child and Maternal Health, Harvard School of Public Health, 1991.

Consultant, Committee on the Courts, Arizona Supreme Court, 1988-1989.

Consultant, Bonneville Power Authority, 1986-1988.

Consultant, Special Counsel, Department of Energy, 1979-82.

Consultant, National Governors Association, 1979-81

Consultant, Environmental Monitoring Project, Environmental Protection Agency, 1979

Consultant, Energy Office, State of New York, 1976-78

Consultant, Department of Health, City of New York, 1976-78

Consultant, Center for the Study of Emergency Health Services, University of Pennsylvania, 1977

Consultant, Chancellor, The University of Missouri, 1976

Consultant, National Commission on Water Quality, 1974-76

Consultant, Trout Unlimited, 1976

Consultant, Policy Analysis Division, Department of Housing and Urban Development, 1974

Consultant, Department of Political Science, Ohio State University, 1974

Consultant, Committee on State Employee Benefits, Assembly of the State of Ohio, 1973

Consultant, Department of Preventive Medicine, Ohio State University, 1972-73

**Editorial Service:**

Abstract Review Board, Annual Meeting, Society for General Internal Medicine, 1995

Member, Editorial Board, Sociological Methodology, Publication of the American Sociological Association, 1979-1983

Associate Editor, Series on Social Methodology, Sage Publications, 1974-81

Member, Editorial Board, Journal of Politics, 1974-81

Associate Editor, Journal of the American Statistical Association, 1977-79

Abstracter, Executive Sciences Incorporated, 1974-79

Abstracter, Mathematical Reviews, 1974-76

Proposal reviewer for a variety of public agencies. In 1991-93 reviewed proposals for NIH, NIMH, NSF, DOE, EPA and others

Manuscript reviewer for several publishers including John Wiley and Sons and Wadsworth

**Honors and Awards:**

Listed in the International Who's Who in Medicine, 1997-

Listed in Who's Who in Medicine, 1994-

Honorary Member, Phi Beta Phi, Honorary Society, inducted 1991

Distinguished Research Professor, Arizona State University, 1987-88

Fellow, Royal Statistical Society, elected November, 1984.

Listed in Who's Who in the West, 1983-

Listed in Who's Who in Medical Research, 1982-

Listed in Personalities in America, 1981-

Listed in Distinguished Educators, 1982-

Member, Phi Beta Kappa, inducted 1967

Member, Alpha Iota Delta (Decision Science Honorary Society), elected 1986

Distinguished Alumni Award, Ohio State University, 1971

Awardee, Graduate Scholarship, National Science Foundation, 1967

Recipient, President's Scholarship Award, Ohio State University, 1968

Recipient, President's Scholarship Award, Ohio State University, 1967

**Research Grants and Contracts:**

Co-Principal Investigator, Alzheimer's Disease and Anti-Inflammatory Prevention: Is Elevated Serum Cholesterol Predictive of Developing AD?, D. Larry Sparks, PI, Institute for the Study of Aging, funded, March 2001, 360,000

Biostatistical Problems in Research Methodology, Samaritan Health Services, Principal Investigator: L.S. Mayer, 1996-2003, approximate award 450,000

Statistical Problems in Developing Intermediate Outcome Models of the Role of Apolipoprotein E in Alzheimer's Disease, Office of Research, Arizona State University, 1994-95, approximate award 20,000.

Biostatistical Problems in Research Methodology, Samaritan Health Services, Principal Investigator: L.S. Mayer, 1995-96, approximate award 26,000

Co-Principal Investigator, Prevention Research Training Grant, awarded by the Prevention Branch, National Institute of Mental Health, to the Prevention Center, Department of Mental Hygiene, Johns Hopkins School of Hygiene and Public Health. Principal Investigator: S. G. Kellam, 1994-1999, approximate award 500,000

Co-Principal Investigator, Epidemiological Prevention Center for Early Risk Behavior, awarded by the Prevention Branch, National Institute of Mental Health, to the Prevention Center, Department of Mental Hygiene, Johns Hopkins School of Hygiene and Public Health. Principal Investigator: S. G. Kellam, 1990-1995, approximate award, 5,000,000

Biostatistical Problems in Research Methodology, Samaritan Health Services, Principal Investigator: L.S. Mayer, 1994-95, approximate award 26,000

Biostatistical Problems in Research Methodology, Samaritan Health Services, Principal Investigator: L.S. Mayer, 1993-94, approximate award 25,000

Wharton Support to Litigation Project, awarded by the Office of the Special Counsel, Department of Energy to the Wharton Analysis Center, Wharton School, University of Pennsylvania. Principal Investigator: L.S. Mayer, 1981-83, approximate award: 2,200,000

Wharton Energy Allocation Project, awarded by the Department of Energy to the Wharton Analysis Center, Wharton School, University of Pennsylvania, Principal Investigator: L.S. Mayer, 1981-83, approximate award: 100,000

Wharton Energy Data Analysis Project, awarded by Oak Ridge National Laboratory to the Wharton Analysis Center, Wharton School, University of Pennsylvania, Principal Investigator: L.S. Mayer, 1980-81, approximate award: 450,000

Wharton Petroleum Data Analysis Project, awarded by CEXEC, Inc. to the Wharton Analysis Center, Wharton School, University of Pennsylvania, Principal Investigator: L.S. Mayer, 1980-81, approximate award: 100,000

Wharton Model Evaluation Project, awarded by the Energy Information Administration, Department of Energy to the Wharton Analysis Center, Wharton School, University of Pennsylvania, Principal Investigator: L.S. Mayer, 1979-81, approximate award: 900,000

Wharton Energy Assessment Project, awarded by Oak Ridge National Laboratory to the Wharton Analysis Center, Wharton School, University of Pennsylvania, Principal Investigator: L.S. Mayer, 1980-81, approximate award: 100,000

Princeton Resource Estimation and Validation Project, awarded by the Energy Information Administration, Department of Energy, to the Departments of Statistics and Geology, Princeton University, Principal Investigators: K. Deffeyes, G. Watson, and L. Mayer, 1978-79, approximate award: 450,000

Analysis of Residential Energy Demand, awarded by the Office of Conservation, Department of Energy to the Center for Energy and Environmental Studies, Princeton University, Principal Investigators: R. Socolow, D. Harrje, L. Mayer and F. Sinden, 1977-78, approximate award: 300,000

Analysis of Statistical Issues Arising from Energy Studies, awarded by the National Science Foundation to the Center for Energy and Environmental Studies, Princeton University, Principal Investigator: L.S. Mayer, 1977-78, approximate award: 50,000

Analysis of Residential Energy Demand, awarded by the Energy Research and Development Administration to the Center for Energy and Environmental Studies, Princeton University, Principal Investigators: R. Socolow, D. Harrje and L. Mayer, 1976-77, approximate award: 300,000

Assessing the Value of Econometric Energy Models, awarded by the Department of Commerce to the Center for Energy and Environmental Studies, Princeton University, Principal Investigator: L.S. Mayer, 1976-77, approximate award: 25,000



Energy Husbandry in Residential Housing, awarded by the National Science Foundation to the Center for Environmental Studies, Princeton University, Principal Investigators: R. Socolow, D. Harje and L. Mayer, 1975-76, approximate award: 300,000

On Comparing Factor Matrices, awarded by the National Institute of Mental Health to the Department of Statistics, Princeton University, Principal Investigator: L.S. Mayer, 1974 - 1975, approximate award: 15,000

Measuring the Relationship Between Abstract Variables, awarded by the National Institute of Mental Health to the Department of Statistics, Virginia Polytechnic Institute and State University, Principal Investigator: L.S. Mayer, 1972-74, approximate award: 15,000

Component Analysis of Variance, awarded by the National Institute of Mental Health to the Behavioral Sciences Laboratory, Ohio State University and the Department of Statistics, Virginia Polytechnic Institute and State University, Principal Investigator: L.S. Mayer, 1971-72, approximate award: 15,000

**Papers Presented at Professional Meetings:**

Depression in Assisted Living is Common and Related To Physical Burden, Gerontology Society Annual Meeting, Washington DC, November 2004

"Methodological Issues In Modeling The Incidence Of Alzheimer's Disease As A Function Of Age", World Congress of Epidemiology, Toronto, June, 2001

"Biostatistical Problems in Forecasting the Prevalence of Alzheimer's Disease" World Psychiatric Congress, Baltimore, March, 2001

"Using Latent Growth Models and Exploratory Methods to Assess the Relationship Between Responses in a Bivariate Prevention Model (with M. Reiser) Society for Prevention Research, Annual Meeting, Washington DC, May 1997

"Standard Metrics and Methods for Conducting Avian Wind Energy Interaction Studies (with R. Anderson) American Wind Energy Association Conference, Austin Texas, June, 1997

"A Randomized Clinical Trial of a Group Empowerment Program for Somatizing Patients: Six Months Follow-up Results", (with J. C. Peirce, A. Miller and J. Westley), invited lecture, Society for General Internal Medicine, Washington, DC, May 1997

"Measuring Effectiveness: Lessons from Heparinizing Patients with Deep Vein Thrombosis and Pulmonary Embolism" (with J. C. Peirce and R. A. Raschke), invited lecture, Society for General Internal Medicine, Washington, DC, May 1997

"Latent Growth Models of the Impact of Intervention on a Bivariate Longitudinal Response", invited lecture, Society for Research on Child Development, Washington, DC, March, 1997

"Developmental Epidemiology and its Implications for Prevention Research" invited lecture (with Sheppard Kellam), Life History Society Annual Meeting, London, December, 1996

"Standard Methods for Conducting Avian Mortality Studies", with R. L. Anderson, European Wind Energy Conference, Rome, October, 1996

"Using Multilevel Models to Tease Out Variability in Individual Behavior", invited lecture, Association

for Clinical Psychosocial Research, American Psychiatric Association, Boston, October, 1996

"Statistical Issues Arising from Application of the Proximal-Distal Model in Prevention Research, Society for Prevention Research, San Juan, Puerto Rico, June, 1996.

"Recent Advances in Prevention Methodology: Multilevel Models", invited lecture, Prevention Methodology Conference, Tempe, Arizona, May 1996

"Advances in the Methods of Prevention Research", invited lecture, National Forum on Prevention, McLean, VA, May, 1996

"Multilevel Models in Prevention Science", invited presentation, Prevention Science Methodology Group meeting, College of Public Health, University of South Florida, Tampa, March, 1996

"Prevented Fractions and Attributable Risk in Proximal Distal Prevention Models", invited lecture, College of Public Health, University of South Florida, Tampa, February, 1996

"Prevented Fractions and Attributable Risks in Preventive Trials", invited paper, Prevention Science and Methodology Conference, Baltimore, MD, October, 1995

"The Use of Epidemiological Measures to Estimate the Effects of Adverse Factors and Preventive Interventions", Workshop on Avian Mortality, Palm Springs, September, 1995

"The Use of Epidemiological Measures to Estimate the Effects of Adverse Factors and Preventive Interventions", invited presentation, Workshop on Avian Mortality and Avian Windpower Planning Meeting, Department of Energy, Palm Springs, September, 1995

"Methodological Advances in Prevention Research", with S. Kellam and J. Anthony, invited symposium, Prevention Research Society, Scottsdale Arizona, June 1995

"Multilevel Modeling and the Development of Aggressive Behavior", invited paper, World Psychiatric Association, New York, May, 1995

"Attributable Risk and Preventive Fractions in Prevention Research", invited lecture, Workshop on the Science of Prevention, NIMH, Baltimore, December, 1994

"Reduction of Aggressive Behavior Among First Graders and Its Consequences for Later Antisocial Behavior and Drug Use", with S. Kellam, H. Chilcoat, J. Anthony, G. Rebok, and N. Ialongo, invited lecture, Society for Prevention Research, Washington, June, 1994

"The Impact of Failure on Boys and Girls: Preventive Intervention Studies on Achievement and Depression" with S. Kellam, G. Rebok, and N. Ialongo, Society for Life History, Durham, November, 1993

"The Course and Malleability of Aggressive Behavior", with S. Kellam, G. Rebok, and N. Ialongo, invited lecture, American Society of Criminology, Annual Meeting, Phoenix, October, 1993

"Mediated Effects in Structural Equation Models", invited paper, American Statistical Association Annual Meeting, August, 1992

"The Course and Malleability of Aggressive Behavior in Young Children", invited presentation, with S. Kellam, et. al., National Academy of Science Institute of Medicine, Committee on Prevention of Mental Disorders, June, 1992

"Developmental Epidemiology and the course of Aggressive Behavior", Life Course Development Society, Philadelphia, April, 1992

"Modeling the Cotemporal Effects in a Cross-Lagged Panel Model", ASA Annual Meeting, New Orleans, August, 1988

"Estimating Multivariate Continuous Variable Panel Models", ASA Annual Meeting, San Francisco, August, 1987

"Inferences in Cross-Lagged Panel Models," invited paper, AIDS Convention, Phoenix, March, 1986

"Recent Advances in Cross-Lagged Panel Analysis," invited lecture, Southwest Social Science Convention, San Antonio, March, 1986

Hypothesis Testing with Continuous Variable Panel Data," Annual Meeting, Biometrics Society (WNAAR), San Luis Obispo, June, 1985

"Multivariate Cross-Lagged Panel Models: Does IQ Cause Achievement?" invited lecture, Regional Meeting, Institute of Mathematical Statistics, Humboldt State University, Arcata, CA, June, 1983

"Analysis of the U.S. Short-Term Integrated (Energy) Forecasting System," invited lecture, International Energy Conference, Berlin, October 1981

"Assessing Energy Models: A Policy Process Approach," invited lecture, Workshop on Energy Model Validation, National Bureau of Standards, January 1979

"Energy Use and Potential for Conservation," (with David Harje et al.), invited lecture, International Conference on Energy Use Management, Tucson, October 1977

"Large Data Sets and the Meta-Theorems of Exploratory Data Analysis," invited lecture, American Statistical Association, Special Topic Meeting, Dallas, 1977

"The Internalization of Cosmopolitan-Local Orientations Among College Students," (with W. Snizek), invited lecture, Southern Sociological Association, Washington, D.C., April 1975

"Equivalent Estimation and a Special Group Structure," (with T. Woteki), invited lecture, Regional Meeting, Institute of Mathematical Statistics, Minneapolis, March 1975

"The Use and Abuses of Probability in Voting Theory Models," invited lecture, Annual Meeting, Public Choice Society, New Haven, April 1974

"Some Problems with the Theory of Coalitions as Applied to the Judiciary," invited paper, Annual Meeting, American Political Science Association Convention, Chicago, August 1974

"On Principal Components and Clusters," invited lecture, Annual Meeting, International Classification Society, Atlanta, Georgia, April, 1973

"On Biased Estimation in Linear Models," invited lecture, Annual Meeting, American Statistical Association, New York, December, 1973

"Invariant Estimation with Applications to Linear Models," (with M.S. Younger), Institute of Mathematical Statistics, Blacksburg, Virginia, Academy of Science, May, 1972

"On Biased Estimation in Linear Models," invited lecture, Virginia Academy of Science, Lexington, Virginia, May, 1972

"Methods of Cluster Analysis Which Utilize Principle Components," invited lecture, International Classification Society Convention, Chicago, Illinois, April 1972

"A Method of Cluster Analysis," invited lecture, Annual Meeting, Biometrics Society, Fort Collins, Colorado, August, 1971

"Measures of Association," invited lecture, International Studies Association, San Juan, Puerto Rico, March, 1971

"Utilizing Initial Estimates in Estimating the Coefficients in a General Linear Model," Annual Meeting, Institute of Mathematical Statistics, Laramie, Wyoming, August 1970

### **Speeches, Presentations, Lectures and Colloquia:**

"Validating Biomarkers in Psychiatry", Department of Psychiatry, University of Athens, Athens, Greece, October, 2006

"Fitting Failure Models to the Incidence of Alzheimer's Disease: Methodological Problems", invited lecture, Johns Hopkins School of Public Health, Noon conference series on Mental Health, January, 2001

"Psychiatric Epidemiology", Residency Program in Psychiatry, Samaritan Health System, September, 2000

"Critical Appraisal in Internal Medicine", invited speaker, Good Samaritan Internal Medicine Program. April, 2000

"Psychiatric Epidemiology", Residency Program in Psychiatry, Samaritan Health System, September, 1999

"Tradeoffs Between Latent Growth Models and Epidemiological Models of Preventive Interventions, invited colloquium, Department of Mental Hygiene, Johns Hopkins School of Hygiene and Public Health, October, 1998

"Psychiatric Epidemiology", Residency Program in Psychiatry, Samaritan Health System, September, 1998

"Advances in Psychiatric Epidemiology", Clinical Epidemiology Section, Royal Medical Society (Edinburgh), August, 1998

"Latent Growth Models and Attributable Risks", luncheon speaker, Fellowship in Drug Epidemiology, Johns Hopkins University, April 1998

"Attributable Risk Measure in Mediational Impact Models: Somatizing Behavior", invited colloquium, Department of Mental Hygiene, Johns Hopkins School of Hygiene and Public Health, March, 1998

"Statistical Issues in Using Attributable Risk Measures in Intermediate Outcome Models",  
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Department of Statistics, The University of Lancaster, Lancaster, England, June, 1997

"Statistical Problems that Arise in Applying Intermediate outcome Models in Prevention Research", invited lecture, Department of Statistics, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, May, 1997

"The Epidemiology of Thyroid Disease", invited lecture, Grand Rounds in Endocrinology, Samaritan Health Services, April, 1997

"Attributable Risk and Preventive Fractions in Prevention Research", invited lecture, Workshop on the Science of Prevention, NIMH, Baltimore, December, 1994

"Advances in Prevention Methodology", invited lecture, Prevention Research Center, Johns Hopkins University, September, 1994

"Multi-level Modeling in Prevention Research", invited colloquium, Prevention Research Center, Arizona State University, April, 1994

"Multi-level Modeling of Health Data; The Effects of Intervention on Aggressive Behavior", invited lecture, Program in Developmental Biology, University of North Carolina, April, 1994

"Mediation in Intermediate Variable Models", Department of Epidemiology and Biostatistics, College of Public Health, University of South Florida, March, 1994

"Assessing the Impact of Interventions on Proximal and Distal Outcomes" NIMH Prevention Research Center Directors Meeting, October 1993 with Reiser, M. and Warsi, G

"Epidemiology and Social Methodology: Complementarity in Prevention Research", invited presentation, with S. Kellam, et. al., NIMH Prevention Research Conference, Tysons Corners, VA, April, 1993

"Statistical Issues in Prevention Research", invited lecture, Directors' Meeting, Prevention Research Center Directors Meeting, National Institute of Mental Health, Rockville, Maryland, October, 1992

"The Course and Malleability of Aggressive Behavior in Young Children", invited presentation, with S. Kellam, et. al., National Academy of Science Institute of Medicine, Committee on Prevention of Mental Disorders, June, 1992

"Causal Models in Prevention Research: Mediation Moderation and Confounding", invited seminar, Carl A. Taube Memorial Colloquium Series in Psychiatry and Mental Health, Johns Hopkins University, May, 1992

"Breast Implants, Risk Surveillance and Health Statistics", invited lecture, MBA Special Colloquium Series, Arizona State University, March, 1992

"Proximal/Distal Effects on Two Developmental Epidemiologically-Based Preventive Interventions", invited seminar, Colloquium Series in Mental Health, Johns Hopkins School of Hygiene and Public Health, February, 1992

"Analyzing Subgroups and Contextual Effects" [with Sheppard Kellam], invited presentation, Directors' Meeting, Prevention Research Center Directors Meeting, National Institute of Mental Health, Rockville, Maryland, September, 1991

"Proximal/Distal Effects on Two Developmental Epidemiologically-Based Preventive Interventions" [with Sheppard Kellam, et. al.], invited seminar, Carl A. Taube Memorial Colloquium Series in Mental Health, Johns Hopkins School of Hygiene and Public Health, September 1991

"The Epidemiology of Preventive Care in the Workplace", invited lecture, Phoenix Chapter, Association of Corporate Fitness Directors, Phoenix, May 1991.

"Statistics, Medicine and the Law", Invited Lecture, East Mesa Doctors Club, November 1990

"Statistical Models in the Analysis of Panel Data", invited lecture, Department of Biostatistics, Johns Hopkins School of Hygiene and Public Health, April, 1990

"Applications of Statistics to Occupational Health Problems", invited lecture, Department of Statistics, MacQuarie University, Australia, October, 1989

"Panel Models and Policy Analysis", invited lecture, Lincoln College, Christchurch, New Zealand, September 1989

"Panel Analysis and Occupational Health Analysis", invited lecture, University of Otago, New Zealand", September 1989

"Current Trends in Data Analysis, invited lecture, MBA colloquium, University of Canterbury, Christchurch, New Zealand, September 1989

"Managing the Health of Workers and the Health of the Firm", invited banquet speech, Conference on Analysis of Occupational Health Risks, Phoenix, August 1987

"Panel Models, Covariance Structures and the Exclusion of Liberals from 'Death-Sentence' Juries", invited colloquium, Department of Statistics, Stanford University, August, 1986

"A Statistician Looks at Panel Analysis or a Perfidious Peek at Pundits and Pookas," invited lecture, Arizona Chapter, American Statistical Association, March, 1984.

"A Statistician Looks at Panel Analysis", invited lecture, College of Business, University of Tennessee, June, 1983

"The Use of Panel Models in Non-experimental Research", invited lecture, College of Medicine, University of California, San Francisco, June, 1983

"Competing Approaches to Analysis of Panel Data", invited lecture, Econometrics Seminar, Stanford University, May 1983

"Science Analysis in Politics and the Politics of Science Analysis", invited lecture, Butler University, Indianapolis, March, 1983

"Statistical Problems in Panel Models", invited lecture, College of Education, Stanford University, March, 1983

"A Statistician Looks at Panel Analysis or a Perfidious Peek at Pundits and Pookas", invited lecture, Department of Computer and Information Sciences, University of California, Santa Cruz, February, 1983

"A Statistician Looks at Panel Analysis or a Perfidious Peek at Pundits and Pookas", invited lecture, Department of Computer and Information Sciences, University of Santa Clara, February, 1983

"Statistical Problems in Panel Analysis", invited lecture, Department of Mathematics, University of California, Santa Barbara, February, 1983

"A Statistician Looks at Panel Analysis", invited lecture, Department of Statistics, University of Arizona, February, 1983

"A Crossed Lagged Penal Analysis of Cross-Lagged Panel Analysis", invited colloquium, Department of Statistics, Stanford University, January, 1983

"Some Exciting Problems in Energy Modeling", invited lecture, Department of Mathematics, Arizona State University, August, 1982

"Statistical Problems in Short-term Energy Forecasting", invited lecture, Energy Information Administration, Washington, D.C., February, 1982

"Problems in Forecasting Energy Supplies", Decision Sciences Seminar, Wharton School, September, 1981

"Energy Policy: Myth and Reality", invited lecture, Philadelphia Business Seminar, April, 1981

"Energy Management: Building Image and Minimizing Liabilities", invited lecture, Wharton Executive Development Seminar, April, 1981

"Evaluating Energy Models", invited lecture, Delaware Chapter, American Statistical Association, University of Delaware, May, 1980

"Evaluating Models of Resource Depletion", invited lecture, Department of Economics, New York University, April, 1980.

"Exploratory Methods and the Art of Data Analysis", Dinner speech, Philadelphia Chapter, American Statistical Association, October, 1979

"Models of Domestic Oil Resources: Science Products and Political Agents", invited lecture, Thayer School of Engineering, Dartmouth College, March, 1979

"Models of Sequential Voting", invited lecture, Department of Political Science, Dartmouth College, March, 1979

"Estimating Oil Reserves: The Methods, Models and Policy Issues", invited lecture, School of Public and Urban Policy, University of Pennsylvania, December, 1978

"Estimating the Domestic Crude Oil Resource Base: Examining the King's Approach", invited lecture, Department of Statistics, University of Pennsylvania, November, 1978

"Picking a Multivariate Test Function, The Eenie-Meeny Principle", invited lecture, Montreal Joint Statistics Colloquium, Montreal, November, 1977

"Econometric Energy Models: The Emperor's Quantitative Suit", invited lecture, Department of Commerce, October, 1977

"Exploratory Data Analysis as an Alternative to the Econometric Analysis of Social Problems," invited lecture, Department of Psychology, College of William and Mary, April, 1977

"Analyzing Energy Policy: The Competing Roles of the Economist, Engineer and Mathematician", invited lecture, Department of Mathematics, University of South Carolina, April, 1977

"Analyzing Political Data: What Can Statistics Tell Us?," invited lecture, School of International Studies, University of Denver, May, 1976

"Schur-Convexity and the Equivalence of Multivariate Tests", invited seminar, Department of Statistics, Rutgers University, October, 1975

"On Communal Indifference Curves," (with I.J. Good), invited seminar, Mathematical Economics Seminar, Virginia Polytechnic Institute and State University, October, 1975

"The Statistical Analysis of Energy Problems: Who Should We Believe?", invited lecture, Office of Energy Analysis, Department of Commerce, October, 1975

"Energy Research and Residential Housing", invited lecture, The Federal Energy Administration, September, 1975

"Consumer Reaction to the Energy Crisis: The Long Underwear Effect", invited address, West Virginia University, February, 1975

"Mathematical Models and other Forms of Hocus-Pocus", invited lecture, Department of Political Science, West Virginia University, February, 1975

"Factor Analysis: The Short Bed Problem", invited lecture, Department of Statistics and Operations Research, University of Pennsylvania, March, 1975

"LSD and Political Science: Distinguishing Uppers and Downers", invited address, Western New England College, November, 1974

"Probability, Statistics and the Theory of Democracy", invited lecture, Department of Statistics, University of Connecticut, October, 1974

"Statistical Policy Analysis: Assessing the Unobservable", invited lecture, Department of Statistics, Princeton University, January, 1974

"On Procedures for Comparing Factor Matrices", invited lecture, Department of Statistics, University of Connecticut, January, 1974.

"A Mathematician's Doubts About Econometric Solutions to Political Problems", invited lecture, Department of Political Science, Ohio State University, May, 1973

"Estimating the Relationship Between Unobserved Variables, or Can We Sell the Second Canonical Correlation to the Social Scientists?", invited lecture, Department of Statistics, Ohio State University, May, 1973

"Generalized Spatial Models of Voting Theory", invited lecture, Center for Public Choice, Virginia Polytechnic Institute and State University, February, 1973



"Estimating the Relationship Between Ordinal Variables", invited lecture, Department of Statistics, Harvard University, 1973.

"Some Statistical Problems in Spatial Models", invited colloquium, Department of Statistics, Carnegie-Mellon University, Pittsburgh, October, 1972.

"Sex, the Generation Gap, and Fermat's Last Theorem", invited speech, Tidewater Council of Teachers of Mathematics, Norfolk, Virginia, September, 1972

"Mathematics: Is it Irrelevant by Necessity or Design?", invited lecture, Department of Mathematics, Emory and Henry College, Emory, Virginia, April, 1972

"Is There Reason for a Mathematician to help a Social Scientist?", invited to deliver annual Phi Mu Epsilon Lecture, Blacksburg, Virginia, 1972

"Probability Without Calculus and Statistics Without Mathematics", invited lecture, Virginia Mathematics Teachers Annual Convention, Roanoke, Virginia, November, 1972

"If Educators Educate Educators, Who Educates the Educated?", banquet address, State Mathematics Teachers Convention, Norfolk, Virginia, 1971

"Two-Stage Estimation in linear Models", invited lecture, Department of Statistics, Pennsylvania State University, January, 1971

"Problems in Cluster Analysis", invited lecture, Department of Applied Statistics, University of Minnesota, January 1971

#### **Papers in Proceedings:**

Mayer, L. S. and Reiser M.(1992) "Mediation and Confounding in Panel Models of Prevention Research" Proceedings of the Social Statistics Section, American Statistical Association

Mayer, L. S. and Carroll, S. S.(1988) "Modeling the Cotemporal Effect in a Cross-Lagged Panel Model," Proceedings of the Business and Economics Section, American Statistical Association

Carroll, S. S. and Mayer, L. S. (1987) "Testing for Serial Correlation in Cross-Lagged Panel Studies," Proceedings of the Business and Economics Section, American Statistical Association

Carroll, S. S. and Mayer, L. S. (1986) "Evaluation of the Cross Effects Parameters in a Cross-Lagged Panel Model," Proceedings of the Business and Economic Section, American Statistical Association

Mayer, L. S. (1985) "Hypothesis Testing in Cross-Lagged Panel Models," Proceedings of the Social Statistics Section, American Statistical Association

Mayer, L. S. and Carroll, S. S. (1985) "Testing for Serial Correlation in Cross-Lagged Panel Studies," Proceedings of the Business and Economics Section, American Statistical Association

Mayer, L.S. et. al. (1982). "Analysis of the U.S. Short-Term Integrated (Energy) Forecasting System," Proceedings of the International Conference on Energy Use Management, New York: Pergamon Press, 971-982

Harrje, D. and Mayer, L.S. (1978). "Energy Use and the Potential for Conservation," Proceedings  
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of the International Conference on Energy Use Management, Volume II, R. Fazzolare and C. Smith (eds.), New York: Pergamon Press, 749- 771

Mayer, L.S. (1978). "The Use of Semi-Controlled Experiments in the Analysis of Residential Energy Demand," Proceedings of the 1978 Department of Energy Symposium, Washington: Government Printing Office

Mayer, L.S. (1978). "The Value of the Econometric Approach to Forecasting Our Energy Future," Proceedings of the International Conference on Energy Use Management, Volume III, R. Fazzolare and C. Smith (eds.), New York: Pergamon Press, 1073-1082

Mayer, L.S. (1978). "Difficulty in Developing Local Energy Policy," expert testimony, Hearings on Local Energy Policy, Washington: U.S. Congress

Mayer, L.S. (1977). "Exploratory Data Analysis and Classical Statistics: Their Abilities to Shed Light on Energy Issues," Proceedings of the 1977 Department of Energy Symposium, 27-32, Washington: Government Printing Office

#### **Published Abstracts:**

"Equivariant Estimation and A Special Group Structure", (with T. Woteki), Bulletin of the Institute of Mathematical Statistics, 1975

"A Fortran Program for Linear Log Odds Analysis", (with P.J. Pichotta), Behavior Research Methods and Instrumentation, 1974, 6, p. 521

"Invariant Estimation in the Social Sciences", (with M. S. Younger), Bulletin of the Institute of Mathematical Statistics, 1973

"On Principal Components and Clusters", Bulletin of the International Classification Society, 1973

"Methods of Cluster Analysis Which Utilize Principal Components", Bulletin of the International Classification Society, 1972

"Utilizing Initial Estimates in Estimating the Coefficients in General Linear Model", Annals of Mathematical Statistics, October 1970

#### **Society Membership:**

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University Services Committee, ASU, 1988-89

Council on Research and Creative Activities, ASU, 1986-1988

Sunset Review Committee, Meteorite Center, ASU, 1987

Sunset Review Committee, Energy Research Center, ASU, 1987

Chair, Sunset Review Committee, Center for Advanced Research in Transportation, ASU, 1987

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LSM appearances and depositions for the previous four years updated 9 August 2016:

1. Appearances: None

2. Depositions:

*Dean Mostofi, Pro Se, v. Whole Foods Market Group*, Superior Court of the District of Columbia, No. 2011 CA 0000369 B, held on the June 14<sup>th</sup>, 2012 in Washington DC.

ROBERT ANTHONY NORMAN, SR v. ASBESTOS DEFENDANTS, CIVIL DISTRICT COURT, PARISH OF ORLEANS, STATE OF LOUISIANA, NO. 2007-15314, held on the July 16<sup>th</sup>, 2012, in New Orleans, LA.

DELORES TIETZ and MILTON TIETZ v. ABBOTT LABORATORIES, CIRCUIT COURT OF COOK COUNTY, ILLINOIS, COUNTY DEPARTMENT, LAW DIVISION, No. 12L-0002715, held on November 12, 2012 held on the 3<sup>rd</sup> January, 2013 in Phoenix, AZ.

Bell v. Celestino, Circuit Court for Miami-Dade County, No. 09-43951 CA 10, held on the May 16<sup>th</sup>, 2013 in Miami, FL.

Roberts v. Fredericksburg Healthcare, Circuit Court for the County of Spotsylvania, Virginia, no. CL 11-1288, held on the 3<sup>rd</sup> April, 2013 in Phoenix, AZ.

Sowards v. Las Cruces Medical Center, Third Judicial District Court, County of Dona Ana, State of New Mexico, no. D-307-CV-2009-02563, held on the 13<sup>th</sup> October, 2013 in Phoenix, AZ.

Sowards v. Las Cruces Medical Center, Third Judicial District Court, County of Dona Ana, State of New Mexico, no. D-307-CV-2009-02563, held on the 15<sup>th</sup> July. 2014 in Phoenix, AZ.

Hilverding v. Steptodont, Inc. and Novocol Pharmaceutical of Canada, Inc., Court of Fulton County, State of Georgia, No. 13EV018074B, held on the 15<sup>th</sup> January, 2015 in Phoenix AZ.

Hilverding v. Steptodont, Inc. and Novocol Pharmaceutical of Canada, Inc., State Court of Fulton County, State of Georgia, No. 13EV018074B, held on the 10<sup>th</sup> February, 2015 in Annapolis, MD.

Prelas v Mercedes Benz, USA, LLC, Circuit Court, Boone County, State of Missouri, O9BA-CV2409, held on 17<sup>th</sup> April 2015, Phoenix, AZ.

Hilverding v Septodont, et. al, State Court of Fulton County, State of Georgia, Civil Action NO. 13EV018074B, held on the 31<sup>st</sup> August, 2015 in Annapolis, MD.

Hyoung v Target Corporation, SUPERIOR COURT OF THE STATE OF CALIFORNIA FOR THE COUNTY OF LOS ANGELES, State of California, No. NC0580059, Laguna Hills, CA, held on the 6<sup>th</sup> Janaury, 2016, Laguna Hills, CA.

Environmental Research Center Aloe Vera of America SUPERIOR COURT OF THE STATE OF CALIFORNIA, COUNTY OF SAN FRANCISCO, State of California, held on the 20<sup>th</sup> January 2016, San Francisco, CA.

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# DIAGNOSTIC AND STATISTICAL MANUAL OF MENTAL DISORDERS

FIFTH EDITION

# DSM-5™



Washington, DC  
London, England

EXHIBIT 5

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Manufactured in the United States of America on acid-free paper.

ISBN 978-0-89042-554-1 (Hardcover)

ISBN 978-0-89042-555-8 (Paperback)

American Psychiatric Association  
1000 Wilson Boulevard  
Arlington, VA 22209-3901  
www.psych.org

The correct citation for this book is American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Arlington, VA, American Psychiatric Association, 2013.

**Library of Congress Cataloging-in-Publication Data**

Diagnostic and statistical manual of mental disorders : DSM-5. — 5th ed.

p. ; cm.

DSM-5

DSM-V

Includes index.

ISBN 978-0-89042-554-1 (hardcover : alk. paper) — ISBN 978-0-89042-555-8 (pbk. : alk. paper)

I. American Psychiatric Association. II. American Psychiatric Association. DSM-5 Task Force.

III. Title: DSM-5. IV. Title: DSM-V.

[DNLN: 1. Diagnostic and statistical manual of mental disorders. 5th ed. 2. Mental Disorders—classification. 3. Mental Disorders—diagnosis. WM 15]

RC455.2.C4

616.89'075—dc23

2013011061

**British Library Cataloguing in Publication Data**

A CIP record is available from the British Library.

Text Design—Tammy J. Cordova

Manufacturing—Edwards Brothers Malloy

## Gender Dysphoria

In this chapter, there is one overarching diagnosis of gender dysphoria, with separate developmentally appropriate criteria sets for children and for adolescents and adults. The area of sex and gender is highly controversial and has led to a proliferation of terms whose meanings vary over time and within and between disciplines. An additional source of confusion is that in English "sex" connotes both male/female and sexuality. This chapter employs constructs and terms as they are widely used by clinicians from various disciplines with specialization in this area. In this chapter, *sex* and *sexual* refer to the biological indicators of male and female (understood in the context of reproductive capacity), such as in sex chromosomes, gonads, sex hormones, and nonambiguous internal and external genitalia. Disorders of sex development denote conditions of inborn somatic deviations of the reproductive tract from the norm and/or discrepancies among the biological indicators of male and female. *Cross-sex* hormone treatment denotes the use of feminizing hormones in an individual assigned male at birth based on traditional biological indicators or the use of masculinizing hormones in an individual assigned female at birth.

The need to introduce the term *gender* arose with the realization that for individuals with conflicting or ambiguous biological indicators of sex (i.e., "intersex"), the lived role in society and/or the identification as male or female could not be uniformly associated with or predicted from the biological indicators and, later, that some individuals develop an identity as female or male at variance with their uniform set of classical biological indicators. Thus, *gender* is used to denote the public (and usually legally recognized) lived role as boy or girl, man or woman, but, in contrast to certain social constructionist theories, biological factors are seen as contributing, in interaction with social and psychological factors, to gender development. *Gender assignment* refers to the initial assignment as male or female. This occurs usually at birth and, thereby, yields the "natal gender." *Gender-atypical* refers to somatic features or behaviors that are not typical (in a statistical sense) of individuals with the same assigned gender in a given society and historical era; for behavior, *gender-nonconforming* is an alternative descriptive term. *Gender reassignment* denotes an official (and usually legal) change of gender. *Gender identity* is a category of social identity and refers to an individual's identification as male, female, or, occasionally, some category other than male or female. *Gender dysphoria* as a general descriptive term refers to an individual's affective/cognitive discontent with the assigned gender but is more specifically defined when used as a diagnostic category. *Transgender* refers to the broad spectrum of individuals who transiently or persistently identify with a gender different from their natal gender. *Transsexual* denotes an individual who seeks, or has undergone, a social transition from male to female or female to male, which in many, but not all, cases also involves a somatic transition by cross-sex hormone treatment and genital surgery (*sex reassignment surgery*).

*Gender dysphoria* refers to the distress that may accompany the incongruence between one's experienced or expressed gender and one's assigned gender. Although not all individuals will experience distress as a result of such incongruence, many are distressed if the desired physical interventions by means of hormones and/or surgery are not available. The current term is more descriptive than the previous DSM-IV term *gender identity disorder* and focuses on dysphoria as the clinical problem, not identity per se.



## Gender Dysphoria

### Diagnostic Criteria

#### Gender Dysphoria in Children

302.6 (F64.2)

- A. A marked incongruence between one's experienced/expressed gender and assigned gender, of at least 6 months' duration, as manifested by at least six of the following (one of which must be Criterion A1):
1. A strong desire to be of the other gender or an insistence that one is the other gender (or some alternative gender different from one's assigned gender).
  2. In boys (assigned gender), a strong preference for cross-dressing or simulating female attire; or in girls (assigned gender), a strong preference for wearing only typical masculine clothing and a strong resistance to the wearing of typical feminine clothing.
  3. A strong preference for cross-gender roles in make-believe play or fantasy play.
  4. A strong preference for the toys, games, or activities stereotypically used or engaged in by the other gender.
  5. A strong preference for playmates of the other gender.
  6. In boys (assigned gender), a strong rejection of typically masculine toys, games, and activities and a strong avoidance of rough-and-tumble play; or in girls (assigned gender), a strong rejection of typically feminine toys, games, and activities.
  7. A strong dislike of one's sexual anatomy.
  8. A strong desire for the primary and/or secondary sex characteristics that match one's experienced gender.
- B. The condition is associated with clinically significant distress or impairment in social, school, or other important areas of functioning.

*Specify if:*

**With a disorder of sex development** (e.g., a congenital adrenogenital disorder such as 255.2 [E25.0] congenital adrenal hyperplasia or 259.50 [E34.50] androgen insensitivity syndrome).

**Coding note:** Code the disorder of sex development as well as gender dysphoria.

#### Gender Dysphoria in Adolescents and Adults

302.85 (F64.1)

- A. A marked incongruence between one's experienced/expressed gender and assigned gender, of at least 6 months' duration, as manifested by at least two of the following:
1. A marked incongruence between one's experienced/expressed gender and primary and/or secondary sex characteristics (or in young adolescents, the anticipated secondary sex characteristics).
  2. A strong desire to be rid of one's primary and/or secondary sex characteristics because of a marked incongruence with one's experienced/expressed gender (or in young adolescents, a desire to prevent the development of the anticipated secondary sex characteristics).
  3. A strong desire for the primary and/or secondary sex characteristics of the other gender.
  4. A strong desire to be of the other gender (or some alternative gender different from one's assigned gender).
  5. A strong desire to be treated as the other gender (or some alternative gender different from one's assigned gender).
  6. A strong conviction that one has the typical feelings and reactions of the other gender (or some alternative gender different from one's assigned gender).

- B. The condition is associated with clinically significant distress or impairment in social, occupational, or other important areas of functioning.

*Specify if:*

**With a disorder of sex development** (e.g., a congenital adrenogenital disorder such as 255.2 [E25.0] congenital adrenal hyperplasia or 259.50 [E34.50] androgen insensitivity syndrome).

**Coding note:** Code the disorder of sex development as well as gender dysphoria.

*Specify if:*

**Posttransition:** The individual has transitioned to full-time living in the desired gender (with or without legalization of gender change) and has undergone (or is preparing to have) at least one cross-sex medical procedure or treatment regimen—namely, regular cross-sex hormone treatment or gender reassignment surgery confirming the desired gender (e.g., penectomy, vaginoplasty in a natal male; mastectomy or phalloplasty in a natal female).

## Specifiers

The posttransition specifier may be used in the context of continuing treatment procedures that serve to support the new gender assignment.

## Diagnostic Features

Individuals with gender dysphoria have a marked incongruence between the gender they have been assigned to (usually at birth, referred to as *natal gender*) and their experienced/expressed gender. This discrepancy is the core component of the diagnosis. There must also be evidence of distress about this incongruence. Experienced gender may include alternative gender identities beyond binary stereotypes. Consequently, the distress is not limited to a desire to simply be of the other gender, but may include a desire to be of an alternative gender, provided that it differs from the individual's assigned gender.

Gender dysphoria manifests itself differently in different age groups. Prepubertal natal girls with gender dysphoria may express the wish to be a boy, assert they are a boy, or assert they will grow up to be a man. They prefer boys' clothing and hairstyles, are often perceived by strangers as boys, and may ask to be called by a boy's name. Usually, they display intense negative reactions to parental attempts to have them wear dresses or other feminine attire. Some may refuse to attend school or social events where such clothes are required. These girls may demonstrate marked cross-gender identification in role-playing, dreams, and fantasies. Contact sports, rough-and-tumble play, traditional boyhood games, and boys as playmates are most often preferred. They show little interest in stereotypically feminine toys (e.g., dolls) or activities (e.g., feminine dress-up or role-play). Occasionally, they refuse to urinate in a sitting position. Some natal girls may express a desire to have a penis or claim to have a penis or that they will grow one when older. They may also state that they do not want to develop breasts or menstruate.

Prepubertal natal boys with gender dysphoria may express the wish to be a girl or assert they are a girl or that they will grow up to be a woman. They have a preference for dressing in girls' or women's clothes or may improvise clothing from available materials (e.g., using towels, aprons, and scarves for long hair or skirts). These children may role-play female figures (e.g., playing "mother") and often are intensely interested in female fantasy figures. Traditional feminine activities, stereotypical games, and pastimes (e.g., "playing house"; drawing feminine pictures; watching television or videos of favorite female characters) are most often preferred. Stereotypical female-type dolls (e.g., Barbie) are often favorite toys, and girls are their preferred playmates. They avoid rough-and-tumble play and competitive sports and have little interest in stereotypically masculine toys (e.g., cars, trucks). Some may pretend not to have a penis and insist on sitting to urinate. More

rarely, they may state that they find their penis or testes disgusting, that they wish them removed, or that they have, or wish to have, a vagina.

In young adolescents with gender dysphoria, clinical features may resemble those of children or adults with the condition, depending on developmental level. As secondary sex characteristics of young adolescents are not yet fully developed, these individuals may not state dislike of them, but they are concerned about imminent physical changes.

In adults with gender dysphoria, the discrepancy between experienced gender and physical sex characteristics is often, but not always, accompanied by a desire to be rid of primary and/or secondary sex characteristics and/or a strong desire to acquire some primary and/or secondary sex characteristics of the other gender. To varying degrees, adults with gender dysphoria may adopt the behavior, clothing, and mannerisms of the experienced gender. They feel uncomfortable being regarded by others, or functioning in society, as members of their assigned gender. Some adults may have a strong desire to be of a different gender and treated as such, and they may have an inner certainty to feel and respond as the experienced gender without seeking medical treatment to alter body characteristics. They may find other ways to resolve the incongruence between experienced/expressed and assigned gender by partially living in the desired role or by adopting a gender role neither conventionally male nor conventionally female.

### **Associated Features Supporting Diagnosis**

When visible signs of puberty develop, natal boys may shave their legs at the first signs of hair growth. They sometimes bind their genitals to make erections less visible. Girls may bind their breasts, walk with a stoop, or use loose sweaters to make breasts less visible. Increasingly, adolescents request, or may obtain without medical prescription and supervision, hormonal suppressors ("blockers") of gonadal steroids (e.g., gonadotropin-releasing hormone [GnRH] analog, spironolactone). Clinically referred adolescents often want hormone treatment and many also wish for gender reassignment surgery. Adolescents living in an accepting environment may openly express the desire to be and be treated as the experienced gender and dress partly or completely as the experienced gender, have a hairstyle typical of the experienced gender, preferentially seek friendships with peers of the other gender, and/or adopt a new first name consistent with the experienced gender. Older adolescents, when sexually active, usually do not show or allow partners to touch their sexual organs. For adults with an aversion toward their genitals, sexual activity is constrained by the preference that their genitals not be seen or touched by their partners. Some adults may seek hormone treatment (sometimes without medical prescription and supervision) and gender reassignment surgery. Others are satisfied with either hormone treatment or surgery alone.

Adolescents and adults with gender dysphoria before gender reassignment are at increased risk for suicidal ideation, suicide attempts, and suicides. After gender reassignment, adjustment may vary, and suicide risk may persist.

### **Prevalence**

For natal adult males, prevalence ranges from 0.005% to 0.014%, and for natal females, from 0.002% to 0.003%. Since not all adults seeking hormone treatment and surgical reassignment attend specialty clinics, these rates are likely modest underestimates. Sex differences in rate of referrals to specialty clinics vary by age group. In children, sex ratios of natal boys to girls range from 2:1 to 4.5:1. In adolescents, the sex ratio is close to parity; in adults, the sex ratio favors natal males, with ratios ranging from 1:1 to 6.1:1. In two countries, the sex ratio appears to favor natal females (Japan: 2.2:1; Poland: 3.4:1).

### **Development and Course**

Because expression of gender dysphoria varies with age, there are separate criteria sets for children versus adolescents and adults. Criteria for children are defined in a more con-

crete, behavioral manner than those for adolescents and adults. Many of the core criteria draw on well-documented behavioral gender differences between typically developing boys and girls. Young children are less likely than older children, adolescents, and adults to express extreme and persistent anatomic dysphoria. In adolescents and adults, incongruence between experienced gender and somatic sex is a central feature of the diagnosis. Factors related to distress and impairment also vary with age. A very young child may show signs of distress (e.g., intense crying) only when parents tell the child that he or she is "really" not a member of the other gender but only "desires" to be. Distress may not be manifest in social environments supportive of the child's desire to live in the role of the other gender and may emerge only if the desire is interfered with. In adolescents and adults, distress may manifest because of strong incongruence between experienced gender and somatic sex. Such distress may, however, be mitigated by supportive environments and knowledge that biomedical treatments exist to reduce incongruence. Impairment (e.g., school refusal, development of depression, anxiety, and substance abuse) may be a consequence of gender dysphoria.

**Gender dysphoria without a disorder of sex development.** For clinic-referred children, onset of cross-gender behaviors is usually between ages 2 and 4 years. This corresponds to the developmental time period in which most typically developing children begin expressing gendered behaviors and interests. For some preschool-age children, both pervasive cross-gender behaviors and the expressed desire to be the other gender may be present, or, more rarely, labeling oneself as a member of the other gender may occur. In some cases, the expressed desire to be the other gender appears later, usually at entry into elementary school. A small minority of children express discomfort with their sexual anatomy or will state the desire to have a sexual anatomy corresponding to the experienced gender ("anatomic dysphoria"). Expressions of anatomic dysphoria become more common as children with gender dysphoria approach and anticipate puberty.

Rates of persistence of gender dysphoria from childhood into adolescence or adulthood vary. In natal males, persistence has ranged from 2.2% to 30%. In natal females, persistence has ranged from 12% to 50%. Persistence of gender dysphoria is modestly correlated with dimensional measures of severity ascertained at the time of a childhood baseline assessment. In one sample of natal males, lower socioeconomic background was also modestly correlated with persistence. It is unclear if particular therapeutic approaches to gender dysphoria in children are related to rates of long-term persistence. Extant follow-up samples consisted of children receiving no formal therapeutic intervention or receiving therapeutic interventions of various types, ranging from active efforts to reduce gender dysphoria to a more neutral, "watchful waiting" approach. It is unclear if children "encouraged" or supported to live socially in the desired gender will show higher rates of persistence, since such children have not yet been followed longitudinally in a systematic manner. For both natal male and female children showing persistence, almost all are sexually attracted to individuals of their natal sex. For natal male children whose gender dysphoria does not persist, the majority are *androphilic* (sexually attracted to males) and often self-identify as gay or homosexual (ranging from 63% to 100%). In natal female children whose gender dysphoria does not persist, the percentage who are *gynephilic* (sexually attracted to females) and self-identify as lesbian is lower (ranging from 32% to 50%).

In both adolescent and adult natal males, there are two broad trajectories for development of gender dysphoria: early onset and late onset. *Early-onset gender dysphoria* starts in childhood and continues into adolescence and adulthood; or, there is an intermittent period in which the gender dysphoria desists and these individuals self-identify as gay or homosexual, followed by recurrence of gender dysphoria. *Late-onset gender dysphoria* occurs around puberty or much later in life. Some of these individuals report having had a desire to be of the other gender in childhood that was not expressed verbally to others. Others do not recall any signs of childhood gender dysphoria. For adolescent males with late-onset gender dysphoria, parents often report surprise because they did not see signs of gender

dysphoria during childhood. Expressions of anatomic dysphoria are more common and salient in adolescents and adults once secondary sex characteristics have developed.

Adolescent and adult natal males with early-onset gender dysphoria are almost always sexually attracted to men (androphilic). Adolescents and adults with late-onset gender dysphoria frequently engage in transvestic behavior with sexual excitement. The majority of these individuals are gynephilic or sexually attracted to other posttransition natal males with late-onset gender dysphoria. A substantial percentage of adult males with late-onset gender dysphoria cohabit with or are married to natal females. After gender transition, many self-identify as lesbian. Among adult natal males with gender dysphoria, the early-onset group seeks out clinical care for hormone treatment and reassignment surgery at an earlier age than does the late-onset group. The late-onset group may have more fluctuations in the degree of gender dysphoria and be more ambivalent about and less likely satisfied after gender reassignment surgery.

In both adolescent and adult natal females, the most common course is the early-onset form of gender dysphoria. The late-onset form is much less common in natal females compared with natal males. As in natal males with gender dysphoria, there may have been a period in which the gender dysphoria desisted and these individuals self-identified as lesbian; however, with recurrence of gender dysphoria, clinical consultation is sought, often with the desire for hormone treatment and reassignment surgery. Parents of natal adolescent females with the late-onset form also report surprise, as no signs of childhood gender dysphoria were evident. Expressions of anatomic dysphoria are much more common and salient in adolescents and adults than in children.

Adolescent and adult natal females with early-onset gender dysphoria are almost always gynephilic. Adolescents and adults with the late-onset form of gender dysphoria are usually androphilic and after gender transition self-identify as gay men. Natal females with the late-onset form do not have co-occurring transvestic behavior with sexual excitement.

**Gender dysphoria in association with a disorder of sex development.** Most individuals with a disorder of sex development who develop gender dysphoria have already come to medical attention at an early age. For many, starting at birth, issues of gender assignment were raised by physicians and parents. Moreover, as infertility is quite common for this group, physicians are more willing to perform cross-sex hormone treatments and genital surgery before adulthood.

Disorders of sex development in general are frequently associated with gender-atypical behavior starting in early childhood. However, in the majority of cases, this does not lead to gender dysphoria. As individuals with a disorder of sex development become aware of their medical history and condition, many experience uncertainty about their gender, as opposed to developing a firm conviction that they are another gender. However, most do not progress to gender transition. Gender dysphoria and gender transition may vary considerably as a function of a disorder of sex development, its severity, and assigned gender.

## **Risk and Prognostic Factors**

**Temperamental.** For individuals with gender dysphoria without a disorder of sex development, atypical gender behavior among individuals with early-onset gender dysphoria develops in early preschool age, and it is possible that a high degree of atypicality makes the development of gender dysphoria and its persistence into adolescence and adulthood more likely.

**Environmental.** Among individuals with gender dysphoria without a disorder of sex development, males with gender dysphoria (in both childhood and adolescence) more commonly have older brothers than do males without the condition. Additional predisposing

factors under consideration, especially in individuals with late-onset gender dysphoria (adulthood), include habitual fetishistic transvestism developing into autogynephilia (i.e., sexual arousal associated with the thought or image of oneself as a woman) and other forms of more general social, psychological, or developmental problems.

**Genetic and physiological.** For individuals with gender dysphoria without a disorder of sex development, some genetic contribution is suggested by evidence for (weak) familiarity of transsexualism among nontwin siblings, increased concordance for transsexualism in monozygotic compared with dizygotic same-sex twins, and some degree of heritability of gender dysphoria. As to endocrine findings, no endogenous systemic abnormalities in sex-hormone levels have been found in 46,XY individuals, whereas there appear to be increased androgen levels (in the range found in hirsute women but far below normal male levels) in 46,XX individuals. Overall, current evidence is insufficient to label gender dysphoria without a disorder of sex development as a form of intersexuality limited to the central nervous system.

In gender dysphoria associated with a disorder of sex development, the likelihood of later gender dysphoria is increased if prenatal production and utilization (via receptor sensitivity) of androgens are grossly atypical relative to what is usually seen in individuals with the same assigned gender. Examples include 46,XY individuals with a history of normal male prenatal hormone milieu but inborn nonhormonal genital defects (as in cloacal bladder exstrophy or penile agenesis) and who have been assigned to the female gender. The likelihood of gender dysphoria is further enhanced by additional, prolonged, highly gender-atypical postnatal androgen exposure with somatic virilization as may occur in female-raised and noncastrated 46,XY individuals with 5-alpha reductase-2 deficiency or 17-beta-hydroxysteroid dehydrogenase-3 deficiency or in female-raised 46,XX individuals with classical congenital adrenal hyperplasia with prolonged periods of non-adherence to glucocorticoid replacement therapy. However, the prenatal androgen milieu is more closely related to gendered behavior than to gender identity. Many individuals with disorders of sex development and markedly gender-atypical behavior do not develop gender dysphoria. Thus, gender-atypical behavior by itself should not be interpreted as an indicator of current or future gender dysphoria. There appears to be a higher rate of gender dysphoria and patient-initiated gender change from assigned female to male than from assigned male to female in 46,XY individuals with a disorder of sex development.

### **Culture-Related Diagnostic Issues**

Individuals with gender dysphoria have been reported across many countries and cultures. The equivalent of gender dysphoria has also been reported in individuals living in cultures with institutionalized gender categories other than male or female. It is unclear whether with these individuals the diagnostic criteria for gender dysphoria would be met.

### **Diagnostic Markers**

Individuals with a somatic disorder of sex development show some correlation of final gender identity outcome with the degree of prenatal androgen production and utilization. However, the correlation is not robust enough for the biological factor, where ascertainable, to replace a detailed and comprehensive diagnostic interview evaluation for gender dysphoria.

### **Functional Consequences of Gender Dysphoria**

Preoccupation with cross-gender wishes may develop at all ages after the first 2-3 years of childhood and often interfere with daily activities. In older children, failure to develop age-typical same-sex peer relationships and skills may lead to isolation from peer groups and to distress. Some children may refuse to attend school because of teasing and harass-

ment or pressure to dress in attire associated with their assigned sex. Also in adolescents and adults, preoccupation with cross-gender wishes often interferes with daily activities. Relationship difficulties, including sexual relationship problems, are common, and functioning at school or at work may be impaired. Gender dysphoria, along with atypical gender expression, is associated with high levels of stigmatization, discrimination, and victimization, leading to negative self-concept, increased rates of mental disorder comorbidity, school dropout, and economic marginalization, including unemployment, with attendant social and mental health risks, especially in individuals from resource-poor family backgrounds. In addition, these individuals' access to health services and mental health services may be impeded by structural barriers, such as institutional discomfort or inexperience in working with this patient population.

## Differential Diagnosis

**Nonconformity to gender roles.** Gender dysphoria should be distinguished from simple nonconformity to stereotypical gender role behavior by the strong desire to be of another gender than the assigned one and by the extent and pervasiveness of gender-variant activities and interests. The diagnosis is not meant to merely describe nonconformity to stereotypical gender role behavior (e.g., "tomboyism" in girls, "girly-boy" behavior in boys, occasional cross-dressing in adult men). Given the increased openness of atypical gender expressions by individuals across the entire range of the transgender spectrum, it is important that the clinical diagnosis be limited to those individuals whose distress and impairment meet the specified criteria.

**Transvestic disorder.** Transvestic disorder occurs in heterosexual (or bisexual) adolescent and adult males (rarely in females) for whom cross-dressing behavior generates sexual excitement and causes distress and/or impairment without drawing their primary gender into question. It is occasionally accompanied by gender dysphoria. An individual with transvestic disorder who also has clinically significant gender dysphoria can be given both diagnoses. In many cases of late-onset gender dysphoria in gynephilic natal males, transvestic behavior with sexual excitement is a precursor.

**Body dysmorphic disorder.** An individual with body dysmorphic disorder focuses on the alteration or removal of a specific body part because it is perceived as abnormally formed, not because it represents a repudiated assigned gender. When an individual's presentation meets criteria for both gender dysphoria and body dysmorphic disorder, both diagnoses can be given. Individuals wishing to have a healthy limb amputated (termed by some *body integrity identity disorder*) because it makes them feel more "complete" usually do not wish to change gender, but rather desire to live as an amputee or a disabled person.

**Schizophrenia and other psychotic disorders.** In schizophrenia, there may rarely be delusions of belonging to some other gender. In the absence of psychotic symptoms, insistence by an individual with gender dysphoria that he or she is of some other gender is not considered a delusion. Schizophrenia (or other psychotic disorders) and gender dysphoria may co-occur.

**Other clinical presentations.** Some individuals with an emasculation desire who develop an alternative, nonmale/nonfemale gender identity do have a presentation that meets criteria for gender dysphoria. However, some males seek castration and/or penectomy for aesthetic reasons or to remove psychological effects of androgens without changing male identity; in these cases, the criteria for gender dysphoria are not met.

## Comorbidity

Clinically referred children with gender dysphoria show elevated levels of emotional and behavioral problems—most commonly, anxiety, disruptive and impulse-control, and de-

pressive disorders. In prepubertal children, increasing age is associated with having more behavioral or emotional problems; this is related to the increasing non-acceptance of gender-variant behavior by others. In older children, gender-variant behavior often leads to peer ostracism, which may lead to more behavioral problems. The prevalence of mental health problems differs among cultures; these differences may also be related to differences in attitudes toward gender variance in children. However, also in some non-Western cultures, anxiety has been found to be relatively common in individuals with gender dysphoria, even in cultures with accepting attitudes toward gender-variant behavior. Autism spectrum disorder is more prevalent in clinically referred children with gender dysphoria than in the general population. Clinically referred adolescents with gender dysphoria appear to have comorbid mental disorders, with anxiety and depressive disorders being the most common. As in children, autism spectrum disorder is more prevalent in clinically referred adolescents with gender dysphoria than in the general population. Clinically referred adults with gender dysphoria may have coexisting mental health problems, most commonly anxiety and depressive disorders.

## Other Specified Gender Dysphoria

302.6 (F64.8)

This category applies to presentations in which symptoms characteristic of gender dysphoria that cause clinically significant distress or impairment in social, occupational, or other important areas of functioning predominate but do not meet the full criteria for gender dysphoria. The other specified gender dysphoria category is used in situations in which the clinician chooses to communicate the specific reason that the presentation does not meet the criteria for gender dysphoria. This is done by recording "other specified gender dysphoria" followed by the specific reason (e.g., "brief gender dysphoria").

An example of a presentation that can be specified using the "other specified" designation is the following:

**The current disturbance meets symptom criteria for gender dysphoria, but the duration is less than 6 months.**

## Unspecified Gender Dysphoria

302.6 (F64.9)

This category applies to presentations in which symptoms characteristic of gender dysphoria that cause clinically significant distress or impairment in social, occupational, or other important areas of functioning predominate but do not meet the full criteria for gender dysphoria. The unspecified gender dysphoria category is used in situations in which the clinician chooses *not* to specify the reason that the criteria are not met for gender dysphoria, and includes presentations in which there is insufficient information to make a more specific diagnosis.





AMERICAN  
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# Answers to Your Questions

## ABOUT TRANSGENDER PEOPLE, GENDER IDENTITY, AND GENDER EXPRESSION

### What does transgender mean?

*Transgender* is an umbrella term for persons whose *gender identity*, *gender expression*, or behavior does not conform to that typically associated with the sex to which they were assigned at birth. *Gender identity* refers to a person's internal sense of being male, female, or something else; *gender expression* refers to the way a person communicates gender identity to others through behavior, clothing, hairstyles, voice, or body characteristics. "Trans" is sometimes used as shorthand for "transgender." While transgender is generally a good term to use, not everyone whose appearance or behavior is gender-nonconforming will identify as a transgender person. The ways in which transgender people are talked about in popular culture, academia, and science are constantly changing, particularly as individuals' awareness, knowledge, and openness about transgender people and their experiences grow.

### What is the difference between sex and gender?

*Sex* is assigned at birth, refers to one's biological status as either male or female, and is associated primarily with physical attributes such as chromosomes, hormone prevalence, and external and internal anatomy. *Gender* refers to the socially constructed roles, behaviors, activities, and attributes that a given society considers appropriate for boys and men or girls and women. These influence the ways people act, interact, and feel about themselves. While aspects of biological sex are similar across different cultures, aspects of gender may differ.

Various conditions that lead to atypical development of physical sex characteristics are collectively referred to as *intersex conditions*. For information about people with intersex conditions (also known as disorders of sex development), see APA's brochure *Answers to Your Questions About Individuals With Intersex Conditions*.

### Have transgender people always existed?

Transgender persons have been documented in many indigenous, Western, and Eastern cultures and societies from antiquity to the present day. However, the meaning of gender nonconformity may vary from culture to culture.

### What are some categories or types of transgender people?

Many identities fall under the transgender umbrella. The term *transsexual* refers to people whose gender identity is different from their assigned sex. Often, transsexual people alter or wish to alter their bodies through hormones, surgery, and other means to make their bodies as congruent as possible with their gender identities. This process of transition through medical intervention is often referred to as sex or gender reassignment, but more recently is also referred to as gender affirmation. People who were assigned female but identify and live as male and alter or wish to alter their bodies through medical intervention to more closely resemble their gender identity are known as transsexual men or transmen (also known as female-to-male or FTM). Conversely, people who were assigned male but identify and live as female and alter or wish to alter their bodies through medical intervention to more closely resemble their gender identity are known as transsexual women or transwomen (also known as male-to-female or MTF). Some individuals who transition from one gender to another prefer to be referred to as a man or a woman rather than as transgender.

People who *cross-dress* wear clothing that is traditionally or stereotypically worn by another gender in their culture. They vary in how completely they cross-dress, from one article of clothing to fully cross-dressing. Those who cross-dress are usually comfortable with their assigned sex and do not wish to change it. Cross-dressing is a form of gender expression and is not necessarily tied to erotic activity. Cross-dressing is not indicative of sexual orientation (see *Answers to Your Questions for a Better Understanding of Sexual Orientation & Homosexuality* for more information on sexual orientation). The degree of societal acceptance

EXHIBIT 6

for cross-dressing varies for males and females. In some cultures, one gender may be given more latitude than another for wearing clothing associated with a different gender.

The term *drag queens* generally refers to men who dress as women for the purpose of entertaining others at bars, clubs, or other events. The term *drag kings* refers to women who dress as men for the purpose of entertaining others at bars, clubs, or other events.

*Genderqueer* is a term that some people use who identify their gender as falling outside the binary constructs of “male” and “female.” They may define their gender as falling somewhere on a continuum between male and female, or they may define it as wholly different from these terms. They may also request that pronouns be used that are neither masculine nor feminine, such as “zie” instead of “he” or “she,” or “hir” instead of “his” or “her.” Some genderqueer people do not identify as transgender.

Other categories of transgender people include androgynous, multigendered, gender nonconforming, third gender, and two-spirit people. Exact definitions of these terms vary from person to person and may change over time but often include a sense of blending or alternating genders. Some people who use these terms to describe themselves see traditional, binary concepts of gender as restrictive.

### **Why are some people transgender?**

There is no single explanation for why some people are transgender. The diversity of transgender expression and experiences argues against any simple or unitary explanation. Many experts believe that biological factors such as genetic influences and prenatal hormone levels, early experiences, and experiences later in adolescence or adulthood may all contribute to the development of transgender identities.

### **How prevalent are transgender people?**

It is difficult to accurately estimate the number of transgender people, mostly because there are no population studies that accurately and completely account for the range of gender identity and gender expression.

## **What is the relationship between gender identity and sexual orientation?**

*Gender identity* and *sexual orientation* are not the same. *Sexual orientation* refers to an individual’s enduring physical, romantic, and/or emotional attraction to another person, whereas *gender identity* refers to one’s internal sense of being male, female, or something else. Transgender people may be straight, lesbian, gay, bisexual, or asexual, just as nontransgender people may be. Some recent research has shown that a change or a new exploration period in partner attraction may occur during the process of transition. However, transgender people usually remain as attached to loved ones after transition as they were before transition. Transgender people usually label their sexual orientation using their gender as a reference. For example, a transgender woman, or a person who is assigned male at birth and transitions to female, who is attracted to other women would be identified as a lesbian or gay woman. Likewise, a transgender man, or a person who is assigned female at birth and transitions to male, who is attracted to other men would be identified as a gay man.

## **How does someone know that they are transgender?**

Transgender people experience their transgender identity in a variety of ways and may become aware of their transgender identity at any age. Some can trace their transgender identities and feelings back to their earliest memories. They may have vague feelings of “not fitting in” with people of their assigned sex or specific wishes to be something other than their assigned sex. Others become aware of their transgender identities or begin to explore and experience gender-nonconforming attitudes and behaviors during adolescence or much later in life. Some embrace their transgender feelings, while others struggle with feelings of shame or confusion. Those who transition later in life may have struggled to fit in adequately as their assigned sex only to later face dissatisfaction with their lives. Some transgender people, transsexuals in particular, experience intense dissatisfaction with their sex assigned at birth, physical sex characteristics, or the gender role associated with that sex. These individuals often seek gender-affirming treatments.

## What should parents do if their child appears to be transgender or gender nonconforming?

Parents may be concerned about a child who appears to be gender-nonconforming for a variety of reasons. Some children express a great deal of distress about their assigned sex at birth or the gender roles they are expected to follow. Some children experience difficult social interactions with peers and adults because of their gender expression. Parents may become concerned when what they believed to be a “phase” does not pass. Parents of gender-nonconforming children may need to work with schools and other institutions to address their children’s particular needs and ensure their children’s safety. It is helpful to consult with mental health and medical professionals familiar with gender issues in children to decide how to best address these concerns. It is not helpful to force the child to act in a more gender-conforming way. Peer support from other parents of gender-nonconforming children may also be helpful.

## How do transsexuals make a gender transition?

Transitioning from one gender to another is a complex process and may involve transition to a gender that is neither traditionally male nor female. People who transition often start by expressing their preferred gender in situations where they feel safe. They typically work up to living full time as members of their preferred gender by making many changes a little at a time. While there is no “right” way to transition genders, there are some common social changes transgender people experience that may involve one or more of the following: adopting the appearance of the desired sex through changes in clothing and grooming, adopting a new name, changing sex designation on identity documents (if possible), using hormone therapy treatment, and/or undergoing medical procedures that modify their body to conform with their gender identity.

Every transgender person’s process or transition differs. Because of this, many factors may determine how the individual wishes to live and express their gender identity. Finding a qualified mental health professional who is experienced in providing affirmative care for transgender people is an important first step. A qualified professional can provide guidance and referrals to other helping professionals. Connecting with other transgender people through peer support groups and transgender community organizations is also helpful.

The World Professional Association for Transgender Health (WPATH), a professional organization devoted to the treatment of transgender people, publishes *The Standards of Care*, which offers recommendations for the provision of gender affirmation procedures and services.

## Is being transgender a mental disorder?

A psychological state is considered a mental disorder only if it causes significant distress or disability. Many transgender people do not experience their gender as distressing or disabling, which implies that identifying as transgender does not constitute a mental disorder. For these individuals, the significant problem is finding affordable resources, such as counseling, hormone therapy, medical procedures, and the social support necessary to freely express their gender identity and minimize discrimination. Many other obstacles may lead to distress, including a lack of acceptance within society, direct or indirect experiences with discrimination, or assault. These experiences may lead many transgender people to suffer with anxiety, depression, or related disorders at higher rates than nontransgender persons.

According to the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; American Psychiatric Association, 2013), people who experience intense, persistent gender incongruence can be given the diagnosis of *gender dysphoria*. Some contend that the diagnosis inappropriately pathologizes gender noncongruence and should be eliminated. Others argue it is essential to retain the diagnosis to ensure access to care. The *International Classification of Diseases* (ICD) is under revision, and there may be changes to its current classification of intense persistent gender incongruence as *gender identity disorder*.

## What kinds of discrimination do transgender people face?

Anti-discrimination laws in most U.S. cities and states do not protect transgender people from discrimination based on gender identity or gender expression. Consequently, transgender people in most cities and states face discrimination in nearly every aspect of their lives. The National Center for Transgender Equality and the National Gay and Lesbian Task Force released a report in 2011 entitled *Injustice at Every Turn*, which confirmed the pervasive and severe discrimination faced by transgender people. Out of a sample of nearly 6,500 transgender people, the report found that transgender people experience high levels of discrimination in employment, housing, health

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care, education, legal systems, and even in their families. The report can be found at <http://endtransdiscrimination.org>.

Transgender people may also have additional identities that may affect the types of discrimination they experience. Groups with such additional identities include transgender people of racial, ethnic, or religious minority backgrounds; transgender people of lower socioeconomic statuses; transgender people with disabilities; transgender youth; transgender elderly; and others. Experiencing discrimination may cause significant psychological stress, often leaving transgender individuals to wonder whether they were discriminated against because of their gender identity or gender expression, another sociocultural identity, or some combination of all of these.

According to the study, while discrimination is pervasive for the majority of transgender people, the intersection of anti-transgender bias and persistent, structural racism is especially severe. People of color in general fare worse than White transgender people, with African American transgender individuals faring far worse than all other transgender populations examined.

Many transgender people are the targets of hate crimes. They are also the victims of subtle discrimination—which includes everything from glances or glares of disapproval or discomfort to invasive questions about their body parts.

### **How can I be supportive of transgender family members, friends, or significant others?**

- Educate yourself about transgender issues by reading books, attending conferences, and consulting with transgender experts.
- Be aware of your attitudes concerning people with gender-nonconforming appearance or behavior.
- Know that transgender people have membership in various sociocultural identity groups (e.g., race, social class, religion, age, disability, etc.) and there is not one universal way to look or be transgender.
- Use names and pronouns that are appropriate to the person's gender presentation and identity; if in doubt, ask.
- Don't make assumptions about transgender people's sexual orientation,

desire for hormonal or medical treatment, or other aspects of their identity or transition plans. If you have a reason to know (e.g., you are a physician conducting a necessary physical exam or you are a person who is interested in dating someone you've learned is transgender), ask.

- Don't confuse gender nonconformity with being transgender. Not all people who appear androgynous or gender nonconforming identify as transgender or desire gender affirmation treatment.
- Keep the lines of communication open with the transgender person in your life.
- Get support in processing your own reactions. It can take some time to adjust to seeing someone you know well transitioning. Having someone close to you transition will be an adjustment and can be challenging, especially for partners, parents, and children.
- Seek support in dealing with your feelings. You are not alone. Mental health professionals and support groups for family, friends, and significant others of transgender people can be useful resources.
- Advocate for transgender rights, including social and economic justice and appropriate psychological care.
- Familiarize yourself with the local and state or provincial laws that protect transgender people from discrimination.



## **WHERE CAN I FIND MORE INFORMATION ABOUT TRANSGENDER HEALTH, ADVOCACY, AND HUMAN RIGHTS?**

### **○ ○ American Psychological Association**

750 First Street, NE  
Washington, DC 20002  
202-336-6041  
lgbc@apa.org  
www.apa.org/pi/lgbt/index.aspx  
www.apa.org/pi/lgbt/programs/transgender/index.aspx

### **○ ○ Children's National Health System**

Gender and Sexuality Advocacy and Education  
111 Michigan Ave., NW  
Washington, DC 20010  
202-476-4172  
<http://childrensnational.org/gendervariance>

### **○ ○ Family Acceptance Project**

San Francisco State University  
3004 16th Street, #301  
San Francisco, CA 94103  
fap@sfsu.edu  
<http://familyproject.sfsu.edu>

### **○ ○ FTMInternational (FTM means Female-to-Male)**

601 Van Ness Ave., Suite E327  
San Francisco, CA 94102-3200  
877-267-1440  
info@ftmi.org  
www.ftmi.org

### **○ ○ Gender Education & Advocacy**

<http://gender.org>

### **○ ○ Gender Spectrum**

510-788-4412  
info@genderspectrum.org  
www.genderspectrum.org

### **○ ○ National Center for Transgender Equality**

1325 Massachusetts Ave., NW, Suite 700  
Washington, DC 20005  
202-903-0112  
202-393-2241 (fax)  
NCTE@NCTEquality.org  
<http://transequality.org>

### **○ ○ Parents, Families, and Friends of Lesbians and Gays (PFLAG) Transgender Network (TNET)**

PFLAG National Office  
1828 L Street, NW, Suite 660  
Washington, DC 20036  
202-467-8180  
info@pflag.org  
<http://community.pflag.org>

### **○ ○ Sylvia Rivera Law Project**

147 W. 24th Street, 5th Floor  
New York, NY 10011  
212-337-8550  
212-337-1972 (fax)  
info@srlp.org  
<http://srlp.org>

### **○ ○ Transgender Law Center**

1800 Market Street  
San Francisco, CA 94102  
415-865-0176  
info@transgenderlawcenter.org  
<http://transgenderlawcenter.org>

### **○ ○ TransYouth Family Allies**

P.O. Box 1471  
Holland, MI 49422-1471  
888-462-8932  
info@imatyfa.org  
<http://www.imatyfa.org>

### **○ ○ World Professional Association for Transgender Health (WPATH)**

wpath@wpath.org  
www.wpath.org



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**Suggested Bibliographic Citation (modified accordingly for different titles):**

American Psychological Association. (2011). *Answers to your questions about transgender people, gender identity, and gender expression*. Retrieved from <http://www.apa.org/topics/lgbt/transgender.aspx>

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This is the third edition of this brochure. The first was written by the APA Task Force on Gender Identity and Gender Variance and published in 2006. The second edition was revised and updated by members of the APA Committee on Lesbian, Gay, Bisexual, and Transgender Concerns (CLGBTC), Vic Muñoz, EdD, and Kevin Nadal, PhD; and APA Division 44 liaison to the CLGBTC Michael L. Hendricks, PhD, ABPP; with the assistance of the Division 44 Committee on Transgender & Gender Variance Issues; Jill Davidson, PhD, NCSP; J. Rhodes Perry, Associate Director of Policy & Programs, Parents, Families, and Friends of Lesbians and Gays (PFLAG); and Anneliese Singh, PhD, LPC, NCC.

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*Produced by the APA Lesbian, Gay, Bisexual, and Transgender Concerns Office and APA Public and Member Communications*





## Gender Dysphoria in Children

*American College of Pediatricians – June 2017*

**ABSTRACT:** Gender dysphoria (GD) of childhood describes a psychological condition in which children experience a marked incongruence between their experienced gender and the gender associated with their biological sex. When this occurs in the pre-pubertal child, GD resolves in the vast majority of patients by late adolescence. Currently there is a vigorous, albeit suppressed, debate among physicians, therapists, and academics regarding what is fast becoming the new treatment standard for GD in children. This new paradigm is rooted in the assumption that GD is innate, and involves pubertal suppression with gonadotropin releasing hormone (GnRH) agonists followed by the use of cross-sex hormones—a combination that results in the sterility of minors. A review of the current literature suggests that this protocol is founded upon an unscientific gender ideology, lacks an evidence base, and violates the long-standing ethical principle of “First do no harm.”

### Gender Dysphoria in Children: This Debate Concerns More than Science

Gender is a term that refers to the psychological and cultural characteristics associated with biological sex.<sup>1</sup> It is a psychological concept and sociological term, not a biological one. Gender identity refers to an individual’s awareness of being male or female and is sometimes referred to as an individual’s “experienced gender.” Gender dysphoria (GD) in children describes a psychological condition in which they experience marked incongruence between their experienced gender and the gender associated with their biological sex. They often express the belief that they are the opposite sex.<sup>2</sup> The prevalence rates of GD among children has been estimated to be less than 1%.<sup>3</sup> Sex differences in rate of referrals to specialty clinics vary by age. In pre-pubertal children, the ratio of boys to girls ranges from 2:1 to 4.5:1. In adolescents, the sex ratio is close to parity; in adults, the ratio of males to females range from 1:1 to 6.1:1.<sup>2</sup>

The debate over how to treat children with GD is primarily an ethical dispute; one that concerns physician worldview as much as science. Medicine does not occur in a moral vacuum; every therapeutic action or inaction is the result of a moral judgment of some kind that arises from the physician’s philosophical worldview. Medicine also does not occur in a political vacuum and being on the wrong side of sexual politics can have severe consequences for individuals who hold the politically incorrect view.

As an example, Dr. Kenneth Zucker, long acknowledged as a foremost authority on gender identity issues in children, has also been a lifelong advocate for gay and transgender rights. However, much to the consternation of adult transgender activists, Zucker believes that gender-dysphoric pre-pubertal children are best served by helping them align their gender identity with their anatomic sex. This view ultimately cost him his 30-year directorship of the Child Youth and Family Gender Identity Clinic (GIC) at the Center for Addiction and Mental Health in Toronto.<sup>4,5</sup>

Many critics of pubertal suppression hold a modernist teleological worldview. They find it self-evident that there is a purposeful design to human nature, and that cooperation with this design leads to human flourishing. Others, however, identify as post-modernists who reject teleology. What unites the two groups

is a traditional interpretation of “First do no harm.” For example, there is a growing online community of gay-affirming physicians, mental health professionals, and academics with a webpage entitled “First, do no harm: youth trans critical professionals.” They write:

*We are concerned about the current trend to quickly diagnose and affirm young people as transgender, often setting them down a path toward medical transition.... We feel that unnecessary surgeries and/or hormonal treatments which have not been proven safe in the long-term represent significant risks for young people. Policies that encourage—either directly or indirectly—such medical treatment for young people who may not be able to evaluate the risks and benefits are highly suspect, in our opinion.<sup>6</sup>*

Advocates of the medical interventionist paradigm, in contrast, are also post-modernists but hold a subjective view of “First do no harm.” Dr. Johanna Olson-Kennedy, an adolescent medicine specialist at Children’s Hospital Los Angeles, and leader in pediatric gender transitioning, has stated that “[First do no harm] is really subjective. [H]istorically we come from a very paternalistic perspective... [in which] doctors are really given the purview of deciding what is going to be harmful and what isn’t. And that, in the world of gender, is really problematic.”<sup>7</sup> Not only does she claim that “First do no harm” is subjective, but she later also states that it should be left to the child to decide what constitutes harm based upon their own subjective thoughts and feelings.<sup>7</sup> Given the cognitive and experiential immaturity of the child and adolescent, the American College of Pediatricians (the College) finds this highly problematic and unethical.

### **Gender dysphoria as the result of an innate internal sexed identity**

Professor of social work, Dr. William Brennan, has written that “[t]he power of language to color one’s view of reality is profound.”<sup>8</sup> It is for this reason that linguistic engineering always precedes social engineering — even in medicine. Many hold the mistaken belief that gender once meant biological sex. Though the terms are often used interchangeably they were never truly synonymous.<sup>9,10</sup> Feminists of the late 1960’s and 1970’s used gender to refer to a “social sex” that could differ from one’s “biological sex” in order to overcome unjust discrimination against women rooted in sex stereotypes. These feminists are largely responsible for mainstreaming the use of the word gender in place of sex. More recently, in an attempt to eliminate heteronormativity, queer theorists have expanded gender into an excess of 50 categories by merging the concept of a social sex with sexual attractions.<sup>9</sup> However, neither usage reflects the original meaning of the term.

Prior to the 1950s, gender applied only to grammar not to persons.<sup>9,10</sup> Latin based languages categorize nouns and their modifiers as masculine or feminine and for this reason are still referred to as having a gender. This changed during the 1950s and 1960s as sexologists realized that their sex reassignment agenda could not be sufficiently defended using the words sex and transsexual. From a purely scientific standpoint, human beings possess a biologically determined sex and innate sex differences. No sexologist could actually change a person’s genes through hormones and surgery. Sex change is objectively impossible. Their solution was to hijack the word gender and infuse it with a new meaning that applied to persons. John Money, PhD was among the most prominent of these sexologists who redefined gender to mean ‘the social performance indicative of an internal sexed identity.’<sup>10</sup> In essence, these sexologists invented the ideological foundation necessary to justify their treatment of transsexualism with sex reassignment surgery and called it gender. It is this man-made ideology of an ‘internal sexed identity’ that now dominates mainstream medicine, psychiatry and academia. This linguistic history makes it clear that gender is not and never has been a biological or scientific entity. Rather, gender is a socially and politically constructed concept.

In their “Overview of Gender Development and Gender Nonconformity in Children and Adolescents,” Forcier and Olson-Kennedy dismiss the binary model of human sexuality as “ideology” and present an “alternate perspective” of “innate gender identity” that presents along a “gender continuum.” They



recommend that pediatricians tell parents that a child's "real gender" is what he or she feels it to be because "a child's brain and body may not be on the same page."<sup>11</sup>

Forcier and Olson-Kennedy's claim of an innate discordance between a child's brain and body derives from diffusion-weighted MRI scans that demonstrate the pubertal testosterone surge in boys increases white matter volume, as well as from brain studies of adults who identify as transgender. A study by Rametti and colleagues found that the white matter microstructure of the brains of female-to-male (FtM) transsexual adults, who had not begun testosterone treatment, more closely resembled that of men than that of women.<sup>12</sup> Other diffusion-weighted MRI studies have concluded that the white matter microstructure in both FtM and male-to-female (MtF) transsexuals falls halfway between that of genetic females and males.<sup>13</sup> These studies, however, are of questionable clinical significance due to the small number of subjects and the existence of neuroplasticity. Neuroplasticity is the well-established phenomenon in which long-term behavior alters brain microstructure. There is no evidence that people are born with brain microstructures that are forever unalterable, but there is significant evidence that experience changes brain microstructure.<sup>14</sup> Therefore, if and when valid transgender brain differences are identified, these will likely be the result of transgender behavior rather than its cause. More importantly, however, is the fact that the brains of all male infants are masculinized prenatally by their own endogenous testosterone, which is secreted from their testes beginning at approximately eight weeks' gestation. Female infants, of course, lack testes, and therefore, do not have their brains masculinized by endogenous testosterone.<sup>15,16,17</sup> For this reason, barring one of the rare disorders of sex development (DSD), boys are not born with feminized brains, and girls are not born with masculinized brains.

Behavior geneticists have known for decades that while genes and hormones *influence* behavior, they do not hard-wire a person to think, feel, or behave in a particular way. The science of epigenetics has established that genes are not analogous to rigid "blueprints" for behavior. Rather, humans "develop traits through the dynamic process of gene-environment interaction... [genes alone] don't determine who we are."<sup>18</sup> Regarding the etiology of transgenderism, twin studies of adult transsexuals prove definitively that prenatal genetic and hormone influence is minimal.

Twin studies are instrumental in elucidating the degree to which a trait is biologically determined before birth. Since monozygotic twins are conceived with exactly the same DNA and are exposed to the same prenatal environment, traits that are solely determined by genes and/or by the prenatal environment, will manifest in both identical twins 100% of the time. Race is an example of a trait that identical twins share 100 percent of the time because it is solely determined by genes.

The largest transsexual twin study to date examines 110 twin pairs and was published by Dr. Milton Diamond in the May 2013 issue of the *International Journal of Transgenderism*.<sup>19</sup> Table 5 documents that the number of monozygotic twin pairs concordant for transsexualism is greater than that of dizygotic twin pairs. This suggests a possible biological predisposition for gender dysphoria. The most significant data entry, however, is the low number of concordant monozygotic twin pairs. Only 21 monozygotic twin pairs out of a total of 74 monozygotic pairs, or 28 percent, were concordant for transsexualism; the remaining 72 percent of identical twins were discordant for transsexualism. This means that at least 72 percent of what accounts for transsexualism in one twin and not in the other occurs *after* birth and is *not* biological. Such a high discordance rate among identical twins proves that no one is born pre-determined to have gender dysphoria let alone pre-determined to identify as transgender or transsexual. This is consistent with the dramatic rates of resolution of gender dysphoria documented among children when they are not encouraged to impersonate the opposite sex. The low concordance rate also supports the theory that persistent GD is due predominately to the impact of non-shared environmental influences upon certain biologically

vulnerable children. To be clear, twin studies alone establish that the “alternate perspective” of an “innate gender identity” arising from prenatally “feminized” or “masculinized” brains trapped in the wrong body is in fact an ideological belief that has no basis in rigorous science.

A teleological binary view of human sexuality, in contrast, is compatible with biological reality. The norm for human design is to be conceived either male or female. Sex chromosome pairs “XY” and “XX” are genetic determinants of sex, male and female, respectively. They are not genetic markers of a disordered body or birth defect. Human sexuality is binary by design with the purpose being the reproduction of our species. This principle is self-evident. **Barring one of the rare disorders of sex development (DSD), no infant is “assigned” a sex or a gender at birth; rather birth sex declares itself anatomically in utero and is clearly evident and acknowledged at birth.**

The exceedingly rare DSDs, including but not limited to androgen insensitivity syndrome and congenital adrenal hyperplasia, are all medically identifiable deviations from the human binary sexual norm. Unlike individuals with a normal genotype and hormonal axis who identify as “transgender,” those with DSD have an innate biological condition. Sex assignment in individuals with DSDs is complex and dependent on a variety of genetic, hormonal, and physical factors. Nevertheless, the 2006 consensus statement of the Intersex Society of North America did not endorse DSD as a third sex.<sup>20</sup>

### **Post-natal Factors Predominate in the Development and Persistence of GD**

Since identical twins also usually grow up under the same family conditions, twin studies, including Dr. Diamond’s, demonstrate that it is non-shared post-natal events (non-shared environmental factors) that predominate in the development and persistence of gender dysphoria in one twin versus the other. This is not surprising since it is well accepted that a child’s emotional and psychological development is impacted by positive and negative experiences from infancy forward. Family and peer relationships, one’s school and neighborhood, the experience of any form of abuse, media exposure, chronic illness, war, and natural disasters are all examples of environmental factors that impact an individual’s emotional, social, and psychological development. *There is no single-family dynamic, social situation, adverse event, or combination thereof that has been found to destine any child to develop GD.* This fact, together with twin studies, suggests that there are many paths that may lead to GD in certain biologically vulnerable children. The literature regarding the etiology and psychotherapeutic treatment of childhood GD is heavily based upon clinical case studies. These studies suggest that social reinforcement, parental psychopathology, family dynamics, and social contagion facilitated by mainstream and social media, all contribute to the development and/or persistence of GD in some vulnerable children. There may be other as yet unrecognized contributing factors as well.

Most parents of children with GD recall their initial reactions to their child’s cross-sex dressing and other cross-sex behaviors to have been tolerance and/or encouragement. Sometimes parental psychopathology is at the root of the social reinforcement. For example, among mothers of boys with GD who had desired daughters, a small subgroup experienced what has been termed “pathologic gender mourning.” Within this subgroup the mother’s desire for a daughter was acted out by the mother actively cross-dressing her son as a girl. These mothers typically suffered from severe depression that was relieved when their sons dressed and acted in a feminine manner.<sup>21</sup>

A large body of clinical literature documents that fathers of feminine boys report spending less time with their sons between the ages of two and five as compared with fathers of control boys. This is consistent with data that shows feminine boys feel closer to their mothers than to their fathers. In his clinical studies of boys with GD, Stoller observed that most had an overly close relationship with their mother and a distant,

peripheral relationship with their father. He postulated that GD in boys was a “developmental arrest ... in which an excessively close and gratifying mother-infant symbiosis, undisturbed by father’s presence, prevents a boy from adequately separating himself from his mother’s female body and feminine behavior.”<sup>21</sup>

It has also been found that among children with GD, the rate of maternal psychopathology, particularly depression and bipolar disorder is “high by any standard.” Additionally, a majority of the fathers of GD boys are easily threatened, exhibit difficulty with affect regulation, and possess an inner sense of inadequacy. These fathers typically deal with their conflicts by overwork or otherwise distance themselves from their families. Most often, the parents fail to support one another, and have difficulty resolving marital conflicts. This produces an intensified air of conflict and hostility. In this situation, the boy becomes increasingly unsure about his own self-value because of the mother’s withdrawal or anger and the father’s failure to intercede. The boy’s anxiety and insecurity intensify, as does his anger, which may all result in his inability to identify with his biological sex.<sup>22</sup>

Systematic studies regarding girls with GD and the parent-child relationship have not been conducted. However, clinical observations suggest that the relationship between mother and daughter is most often distant and marked by conflict, which may lead the daughter to disidentify from the mother. In other cases, masculinity is praised while femininity is devalued by the parents. Furthermore, there have been cases in which girls are afraid of their fathers who may exhibit volatile anger up to and including abuse toward the mother. A girl may perceive being female as unsafe, and psychologically defend against this by feeling that she is really a boy; subconsciously believing that if she were a boy she would be safe from and loved by her father.<sup>21</sup>

There is evidence that psychopathology and/or developmental diversity may precipitate GD in adolescents, particularly among young women. Recent research has documented increasing numbers of adolescents who present to adolescent gender identity clinics and request sex reassignment (SR). Kaltiala-Heino and colleagues sought to describe the adolescent applicants for legal and medical sex reassignment during the first two years of an adolescent gender identity clinic in Finland, in terms of sociodemographic, psychiatric, and gender identity related factors and adolescent development. They conducted a structured quantitative retrospective chart review and qualitative analysis of case files of all adolescent SR applicants who entered the assessment by the end of 2013. They found that the number of referrals exceeded expectations in light of epidemiological knowledge. Natal girls were markedly overrepresented among applicants. Severe psychopathology preceding the onset of GD was common. Many youth were on the autism spectrum. These findings do not fit the commonly accepted image of a gender dysphoric child. The researchers conclude that treatment guidelines need to consider GD in minors in the context of severe psychopathology and developmental difficulties.<sup>23</sup>

Anecdotally, there is also an increasing trend among adolescents to self-diagnose as transgender after binges on social media sites such as Tumblr, Reddit, and YouTube. This suggests that social contagion may be at play. In many schools and communities, there are entire peer groups “coming out” as trans at the same time.<sup>6</sup> Finally, strong consideration should be given to investigating a causal association between adverse childhood events, including sexual abuse, and transgenderism. The overlap between childhood gender discordance and an adult homosexual orientation has long been acknowledged.<sup>24</sup> There is also a large body of literature documenting a significantly greater prevalence of childhood adverse events and sexual abuse among homosexual adults as compared to heterosexual adults. Andrea Roberts and colleagues published a study in 2013 that found “half to all of the elevated risk of childhood abuse among persons with same-sex sexuality compared to heterosexuals was due to the effects of abuse on sexuality.”<sup>25</sup> It is therefore possible that some individuals develop GD and later claim a transgender identity as a result of childhood maltreatment and/or sexual abuse. This is an area in need of research.

## **GD as an Objective Mental Disorder**

Psychology has increasingly rejected the concept of norms for mental health, focusing instead on emotional distress. The American Psychiatric Association (APA), for example, explains in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) that GD is listed therein not due to the discrepancy between the individual's thoughts and physical reality, but due to the presence of emotional distress that hampers social functioning. The DSM-V also notes that a diagnosis is required for insurance companies to pay for cross-sex hormones and sex reassignment surgery (SRS) to alleviate the emotional distress of GD. Once the distress is relieved, GD is no longer considered a disorder.<sup>2</sup>

There are problems with this reasoning. Consider the following examples: a girl with anorexia nervosa has the persistent mistaken belief that she is obese; a person with body dysmorphic disorder (BDD) harbors the erroneous conviction that she is ugly; a person with body integrity identity disorder (BIID) identifies as a disabled person and feels trapped in a fully functional body. Individuals with BIID are often so distressed by their fully capable bodies that they seek surgical amputation of healthy limbs or the surgical severing of their spinal cord.<sup>26</sup> Dr. Anne Lawrence, who is transgender, has argued that BIID has many parallels with GD.<sup>27</sup> The aforementioned false beliefs, like GD, are not merely emotionally distressing for the individuals but also life-threatening. In each case, surgery to "affirm" the false assumption (liposuction for anorexia, cosmetic surgery for BDD, amputation or surgically induced paraplegia for BIID, sex reassignment surgery for GD) may very well alleviate the patient's emotional distress, but will do nothing to address the underlying psychological problem, and may result in the patient's death. Completely removed from physical reality, the art of psychotherapy will diminish as the field of psychology increasingly devolves into a medical interventionist specialty, with devastating results for patients.

Alternatively, a minimal standard could be sought. Normality has been defined as "that which functions according to its design."<sup>28</sup> One of the chief functions of the brain is to perceive physical reality. Thoughts that are in accordance with physical reality are normal. Thoughts that deviate from physical reality are abnormal—as well as potentially harmful to the individual or to others. This is true whether or not the individual who possesses the abnormal thoughts feels distress. A person's belief that he is something or someone he is not is, at best, a sign of confused thinking; at worst, it is a delusion. Just because a person thinks or feels something does not make it so. This would be true even if abnormal thoughts were biologically "hardwired."

The norm for human development is for an individual's thoughts to align with physical reality; for an individual's gender identity to align with biologic sex. People who identify as "feeling like the opposite sex" or "somewhere in between" or some other category do not comprise a third sex. They remain biological men or biological women. GD is a problem that resides in the mind not in the body. Children with GD do not have a disordered body—even though they feel as if they do. Similarly, a child's distress over developing secondary sex characteristics does not mean that puberty should be treated as a disease to be halted, because puberty is not, in fact, a disease. Likewise, although many men with GD express the belief that they are a "feminine essence" trapped in a male body, this belief has no scientific basis.

Until recently, the prevailing worldview with respect to childhood GD was that it reflected abnormal thinking or confusion on the part of the child that may or may not be transient. Consequently, the standard approach was either watchful waiting or pursuit of family and individual psychotherapy.<sup>1,2</sup> The goals of therapy were to address familial pathology if it was present, treat any psychosocial morbidities in the child, and aid the child in aligning gender identity with biological sex.<sup>21,22</sup> Experts on both sides of the pubertal suppression debate agree that within this context, 80 percent to 95 percent of children with GD accepted their biological sex by late adolescence.<sup>29</sup> This worldview began to shift, however, as adult transgender activists increasingly promoted the "feminine essence" narrative to secure social acceptance.<sup>10</sup> In 2007, the

same year that Boston Children's Hospital opened the nation's first pediatric gender clinic, Dr. J. Michael Bailey wrote:

*Currently the predominant cultural understanding of male-to-female transsexualism is that all male-to-female (MtF) transsexuals are, essentially, women trapped in men's bodies. This understanding has little scientific basis, however, and is inconsistent with clinical observations. Ray Blanchard has shown that there are two distinct subtypes of MtF transsexuals. Members of one subtype, homosexual transsexuals, are best understood as a type of homosexual male. The other subtype, autogynephilic transsexuals, are (sic) motivated by the erotic desire to become women. The persistence of the predominant cultural understanding, while explicable, is damaging to science and to many transsexuals.<sup>30</sup>*

As the "feminine essence" view persisted, the suffering of transgender adults was invoked to argue for the urgent rescue of children from the same fate by early identification, affirmation, and pubertal suppression. It is now alleged that discrimination, violence, psychopathology, and suicide are the direct and inevitable consequences of withholding social affirmation and puberty blockers or cross-sex hormones from a gender dysphoric child.<sup>31</sup> Yet, the fact that 80 percent to 95 percent of gender-dysphoric youth emerge physically and psychologically intact after passing through puberty without social affirmation refutes this claim.<sup>29</sup> Furthermore, over 90 percent of people who die of suicide have a diagnosed mental disorder.<sup>32</sup> There is no evidence that gender-dysphoric children who commit suicide are any different. Therefore, the cornerstone for suicide prevention should be the same for them as for all children: early identification and treatment of psychological co-morbidities.

Nevertheless, there are now 40 gender clinics across the United States that promote the use of pubertal suppression and cross-sex hormones in children. The rationale for suppression is to allow the gender-dysphoric child time to explore gender identity free from the emotional distress triggered by the onset of secondary sex characteristics. The standards followed in these clinics are based on "expert opinion." There is not a single large, randomized, controlled study that documents the alleged benefits and potential harms to gender-dysphoric children from pubertal suppression and decades of cross-sex hormone use. Nor is there a single long-term, large, randomized, controlled study that compares the outcomes of various psychotherapeutic interventions for childhood GD with those of pubertal suppression followed by decades of toxic synthetic steroids. In today's age of "evidence-based medicine," this should give everyone pause. Of greater concern is that pubertal suppression at Tanner Stage 2 (usually 11 years of age) followed by the use of cross-sex hormones will leave these children sterile and without gonadal tissue or gametes available for cryo-preservation.<sup>33,34,35</sup>

Neuroscience clearly documents that the adolescent brain is cognitively immature and lacks the adult capacity needed for risk assessment prior to the early to mid-twenties.<sup>36</sup> There is a serious ethical problem with allowing irreversible, life-changing procedures to be performed on minors who are too young to give valid consent themselves. This ethical requirement of informed consent is fundamental to the practice of medicine, as emphasized by the U.S. Department of Health & Human Services website: "The voluntary consent of the human subject is absolutely essential."<sup>37</sup> Moreover, when an individual is sterilized, even as a secondary outcome of therapy, lacking full, free, and informed consent, it is a violation of international law.<sup>38</sup>

### **Transgender-Affirming Protocol: What Is the Evidence Base?**

Over the past two decades, Hayes, Inc. has grown to become an internationally recognized research and consulting firm that evaluates a wide range of medical technologies to determine the impact on patient safety, health outcomes, and resource utilization. This corporation conducted a comprehensive review and evaluation of the scientific literature regarding the treatment of GD in adults and children in 2014. It

concluded that although “evidence suggests positive benefits” to the practice of using sex reassignment surgery in gender dysphoric adults, “serious limitations [inherent to the research] permit only weak conclusions.”<sup>39</sup> Similarly, Hayes, Inc. found the practice of using cross-sex hormones for gender dysphoric adults to be based on “very low” quality of evidence:

*Statistically significant improvements have not been consistently demonstrated by multiple studies for most outcomes. Evidence regarding quality of life and function in male-to-female (MtF) adults was very sparse. Evidence for less comprehensive measures of well-being in adult recipients of cross-sex hormone therapy was directly applicable to GD patients but was sparse and/or conflicting. The study designs do not permit conclusions of causality and studies generally had weaknesses associated with study execution as well. There are potentially long-term safety risks associated with hormone therapy but none have been proven or conclusively ruled out.*<sup>40</sup>

Regarding treatment of children with GD using gonadotropin releasing hormone (GnRH) agonists and cross-sex hormones, Hayes, Inc. awarded its lowest rating indicating that the literature is “too sparse and the studies [that exist are] too limited to suggest conclusions.”<sup>40</sup>

### **Gender Clinics Proliferate Across United States Despite Lack of Medical Evidence**

In 2007 Dr. Norman Spack, a pediatric endocrinologist and founder of the nation’s first gender clinic at Boston Children’s Hospital, launched the pubertal suppression paradigm in the United States.<sup>41</sup> It consists of first affirming the child’s false self-concept by instituting name and pronoun changes, and facilitating the impersonation of the opposite sex within and outside of the home. Next, puberty is suppressed via GnRH agonists as early as age 11 years, and then finally, patients may graduate to cross-sex hormones at age 16 in preparation for sex-reassignment surgery as an older adolescent or adult.<sup>42</sup> Endocrine Society guidelines currently prohibit the use of cross-sex hormones before age 16 but this prohibition is being reconsidered.<sup>43</sup> Some gender specialists are already bypassing pubertal suppression and instead putting children as young as 11 years old directly onto cross-sex hormones.<sup>44</sup> The rationale is that the child will experience the pubertal development of the desired sex and thereby avoid the iatrogenic emotional distress from maintaining a pre-pubertal appearance as peers progress along their natural pubertal trajectory.

In 2014 there were 24 gender clinics clustered chiefly along the East Coast and in California; one year later there were 40 across the nation. Dr. Ximena Lopez, a pediatric endocrinologist at Children’s Medical Center Dallas, and a member of that program’s GENDER Education and Care, Interdisciplinary Support program (Genecis) stated, “[Use of this protocol is] growing really fast. And the main reason is [that] parents are demanding it and bringing patients to the door of pediatric endocrinologists because they know this is available.”<sup>45</sup> Notice, the *main* reason for the protocol’s increased use is parent demand; not evidence-based medicine.

### **Risks of GnRH Agonists**

The GnRH agonists used for pubertal suppression in gender dysphoric children include two that are approved for the treatment of precocious puberty: leuprolide by intramuscular injection with monthly or once every three month dosing formulations, and histrelin, a subcutaneous implant with yearly dosing.<sup>34</sup> In addition to preventing the development of secondary sex characteristics, GnRH agonists arrest bone growth, decrease bone accretion, prevent the sex-steroid dependent organization and maturation of the adolescent brain, and inhibit fertility by preventing the development of gonadal tissue and mature gametes for the duration of treatment. If the child discontinues the GnRH agonists, puberty will ensue.<sup>34,42</sup> Consequently, the Endocrine Society maintains that GnRH agonists, as well as living socially as the opposite sex, are fully reversible interventions that carry no risk of permanent harm to children.<sup>42</sup> However, social learning theory,

neuroscience, and the single long-term follow-up study of adolescents who have received pubertal suppression described below challenge this claim.

In a follow-up study of their first 70 pre-pubertal candidates to receive puberty suppression, de Vries and colleagues documented that all subjects eventually embraced a transgender identity and requested cross-sex hormones.<sup>46</sup> This is cause for concern. Normally, 80 percent to 95 percent of pre-pubertal youth with GD do not persist in their GD. To have 100 percent of pre-pubertal children choose cross-sex hormones suggests that the protocol itself inevitably leads the individual to identify as transgender. There is an obvious self-fulfilling nature to encouraging a young child with GD to socially impersonate the opposite sex and then institute pubertal suppression. Given the well-established phenomenon of neuroplasticity, the repeated behavior of impersonating the opposite sex will alter the structure and function of the child's brain in some way—potentially in a way that will make identity alignment with the child's biologic sex less likely. This, together with the suppression of puberty that prevents further endogenous masculinization or feminization of the brain, causes the child to remain either a gender non-conforming pre-pubertal boy disguised as a pre-pubertal girl, or the reverse. Since their peers develop normally into young men or young women, these children are left psychosocially isolated. They will be less able to identify as being the biological male or female they actually are. A protocol of impersonation and pubertal suppression that sets into motion a single inevitable outcome (transgender identification) that requires lifelong use of toxic synthetic hormones, resulting in infertility, is neither fully reversible nor harmless.

### **GnRH Agonists, Cross-sex Hormones, and Infertility**

Since GnRH agonists prevent the maturation of gonadal tissue and gametes in both sexes, youth who graduate from pubertal suppression at Tanner Stage 2 to cross-sex hormones will be rendered infertile without any possibility of having genetic offspring in the future because they will lack gonadal tissue and gametes for cryo-preservation. The same outcome will occur if pre-pubertal children are placed directly upon cross-sex hormones. Older adolescents who declined pubertal suppression are advised to consider cryo-preservation of gametes prior to beginning cross-sex hormones. This will allow them to conceive genetic offspring in the future via artificial reproductive technology. While there are documented cases of transgendered adults who stopped their cross-sex hormones in order to allow their bodies to produce gametes, conceive, and have a child, there is no absolute guarantee that this is a viable option in the long term. Moreover, transgendered individuals who undergo sex reassignment surgery and have their reproductive organs removed are rendered permanently infertile.<sup>34,35,36</sup>

### **Additional Health Risks Associated with Cross-sex Hormones**

Potential risks from cross-sex hormones to children with GD are based on the adult literature. Recall that regarding the adult literature, the Hayes report states: "There are potentially long-term safety risks associated with hormone therapy but none have been proven or conclusively ruled out."<sup>40</sup> For example, most experts agree that there is an increased risk of coronary artery disease among MtF adults when placed on oral ethinyl estradiol; therefore, alternative estrogen formulations are recommended. However, there is one study of MtF adults using alternative preparations that found a similar increased risk. Therefore, this risk is neither established nor ruled out.<sup>47,48,49</sup> Children who transition will require these hormones for a significantly greater length of time than their adult counterparts. Consequently, they may be more likely to experience physiologically theoretical though rarely observed morbidities in adults. With these caveats, it is most accurate to say that oral estrogen administration to boys *may* place them at risk for experiencing: thrombosis/thromboembolism; cardiovascular disease; weight gain; hypertriglyceridemia; elevated blood pressure; decreased glucose tolerance; gallbladder disease; prolactinoma; and breast cancer.<sup>47,48,49</sup> Similarly, girls who receive testosterone *may* experience an elevated risk for: low HDL and elevated triglycerides; increased homocysteine levels; hepatotoxicity; polycythemia; increased risk of sleep apnea; insulin

resistance; and unknown effects on breast, endometrial and ovarian tissues.<sup>47,48,49</sup> In addition, girls may legally obtain a mastectomy as early as 16 years of age after receiving testosterone therapy for at least one year; this surgery carries its own set of irreversible risks.<sup>34</sup>

### **The Post-Pubertal Adolescent with GD**

As previously noted, 80 percent to 95 percent of pre-pubertal children with GD will experience resolution by late adolescence if not exposed to social affirmation and medical intervention. This means that 5 percent to 20 percent will persist in their GD as young adults. Currently, there is no medical or psychological test to determine which children will persist in their GD as young adults. Pre-pubertal children with GD who persist in their GD beyond puberty are more likely to also persist into adulthood. The Endocrine Society and others, including Dr. Zucker, therefore regard it reasonable to affirm children who persist in their GD beyond puberty, as well as those who present after puberty, and to proceed with cross-sex hormones at age 16 years.<sup>42</sup>

The College disagrees for the following reasons. First, not all adolescents with GD inevitably go on to trans-identification, but cross-sex hormones inevitably result in irreversible changes for all patients. Second, the young adolescent is simply not sufficiently mature to make significant medical decisions. The adolescent brain does not achieve the capacity for full risk assessment until the early to mid-twenties. There is a significant ethical problem with allowing minors to receive life-altering medical interventions including cross-sex hormones and, in the case of natal girls, bilateral mastectomy, when they are incapable of providing informed consent for themselves. As stated earlier, the College is also concerned about an increasing trend among adolescents to self-diagnose as transgender after binges on social media sites. While many of these adolescents will seek out a therapist after self-identifying, many states have been forced by non-scientific political pressure to ban so-called “conversion therapy.” These bans prevent therapists from exploring not only a young person’s sexual attractions and identity, but also his or her gender identity. Therapists are not allowed to ask why an adolescent believes he or she is transgender; may not explore underlying mental health issues; cannot consider the symbolic nature of the gender dysphoria; and may not look at possible confounding issues such as social media use or social contagion.<sup>6</sup>

### **Impact of sex reassignment in adults as it relates to risk in children**

Surveys suggest that transgender adults express a sense of “relief” and “satisfaction” following the use of hormones and sex reassignment surgery (SRS). However, SRS does not result in a level of health equivalent to that of the general population.<sup>50</sup>

For example, a 2001 study of 392 male-to-female and 123 female-to-male transgender persons found that 62 percent of the male-to-female (MtF) and 55 percent of the female-to-male (FtM) transgender persons were depressed. Nearly one third (32 percent) of each population had attempted suicide.<sup>51</sup> Similarly, in 2009, Kuhn and colleagues found considerably lower general health and general life satisfaction among 52 MtF and 3 FtM transsexuals fifteen years after SRS when compared with controls.<sup>52</sup> Finally, a thirty-year follow-up study of post-operative transgender patients from Sweden found that **the rate of suicide among post-operative transgender adults was nearly twenty times greater than that of the general population. To be clear, this does not prove that sex reassignment causes an increased risk of suicide or other psychological morbidities. Rather, it indicates that sex reassignment alone does not provide the individual with a level of mental health on par with the general population. The authors summarized their findings as follows:**

Persons with transsexualism, after sex reassignment, have considerably higher risks for mortality, suicidal behavior, and psychiatric morbidity than the general population. Our findings suggest that sex



reassignment, though alleviating gender dysphoria, may not suffice as treatment for transsexualism, and should inspire improved psychiatric and somatic care after sex reassignment for this patient group.<sup>50</sup>

It is noteworthy that these mental health disparities are observed in one of the most lesbian, gay, bisexual and transgender (LGBT) affirming nations of the world. It suggests that these health differences are not due primarily to social prejudice, but rather due to the adult transgender condition or lifestyle. This is also consistent with an American study published in the *Journal of LGBT Health* in 2008 that found discrimination did not account for the mental health discrepancies between LGBT-identified individuals and the heterosexual population.<sup>53</sup>

Absent hormonal and surgical intervention, only 5-20 percent of pre-pubertal children with GD will face a transgender adulthood which seems to predispose them to certain morbidities and an increased risk of early death. In contrast, the single study of pre-pubertal children with GD who received pubertal suppression makes clear that 100 percent of these children will face a transgender adulthood. Therefore, the current transgender affirming interventions at pediatric gender clinics will statistically yield this outcome for the remaining 80 to 95 percent of pre-pubertal children with GD who otherwise would have identified with their biological sex by adulthood.

### **Recommendations for research**

Identical twin studies establish that post-natal environmental factors exert a significant influence over the development of GD and transgenderism. Data also reflects a greater than 80% resolution rate among pre-pubertal children with GD. Consequently, identification of the various environmental factors and pathways that trigger GD in biologically vulnerable children should be one focus of research. Particular attention should be given to the impact of childhood adverse events and social contagion. Another area of much needed research is within psychotherapy. Large long term longitudinal studies in which children with GD and their families are randomized to treatment with various therapeutic modalities and assessed across multiple measures of physical and social emotional health are desperately needed and should have been launched long ago. In addition, long term follow-up studies that assess objective measures of physical and mental health of post-surgical transsexual adults must include a matched control group consisting of transgender individuals who do not undergo SRS. This is the only way to test the hypothesis that SRS itself may cause more harm to individuals than they otherwise would experience with psychotherapy alone.

### **Conclusion**

Gender dysphoria (GD) in children is a term used to describe a psychological condition in which a child experiences marked incongruence between his or her experienced gender and the gender associated with the child's biological sex. Twin studies demonstrate that GD is not an innate trait. Moreover, barring pre-pubertal affirmation and hormone intervention for GD, 80 percent to 95 percent of children with GD will accept the reality of their biological sex by late adolescence.

The treatment of GD in childhood with hormones effectively amounts to mass experimentation on, and sterilization of, youth who are cognitively incapable of providing informed consent. There is a serious ethical problem with allowing irreversible, life-changing procedures to be performed on minors who are too young to give valid consent themselves; adolescents cannot understand the magnitude of such decisions.

Ethics alone demands an end to the use of pubertal suppression with GnRH agonists, cross-sex hormones, and sex reassignment surgeries in children and adolescents. The College recommends an immediate cessation of these interventions, as well as an end to promoting gender ideology via school curricula and legislative policies. Healthcare, school curricula and legislation must remain anchored to

physical reality. Scientific research should focus upon better understanding the psychological underpinnings of this disorder, optimal family and individual therapies, as well as delineating the differences among children who resolve with watchful waiting versus those who resolve with therapy and those who persist despite therapy.

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**August 2016**

**Updated June 2017**

*The American College of Pediatricians is a national medical association of licensed physicians and healthcare professionals who specialize in the care of infants, children, and adolescents. The mission of the College is to enable all children to reach their optimal, physical and emotional health and well-being.*

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## Preface

This report was written for the general public and for mental health professionals in order to draw attention to—and offer some scientific insight about—the mental health issues faced by LGBT populations.

It arose from a request from Paul R. McHugh, M.D., the former chief of psychiatry at Johns Hopkins Hospital and one of the leading psychiatrists in the world. Dr. McHugh requested that I review a monograph he and colleagues had drafted on subjects related to sexual orientation and identity; my original assignment was to guarantee the accuracy of statistical inferences and to review additional sources. In the months that followed, I closely read over five hundred scientific articles on these topics and perused hundreds more. I was alarmed to learn that the LGBT community bears a disproportionate rate of mental health problems compared to the population as a whole.

As my interest grew, I explored research across a variety of scientific fields, including epidemiology, genetics, endocrinology, psychiatry, neuroscience, embryology, and pediatrics. I also reviewed many of the academic empirical studies done in the social sciences including psychology, sociology, political science, economics, and gender studies.

I agreed to take over as lead author, rewriting, reorganizing, and expanding the text. I support every sentence in this report, without reservation and without prejudice regarding any political or philosophical debates. This report is about science and medicine, nothing more and nothing less.

Readers wondering about this report's synthesis of research from so many different fields may wish to know a little about its lead author. I am a full-time academic involved in all aspects of teaching, research, and professional service. I am a biostatistician and epidemiologist who focuses on the design, analysis, and interpretation of experimental and observational data in public health and medicine, particularly when the data are complex in terms of underlying scientific issues. I am a research physician, having trained in medicine and psychiatry in the U.K. and received the British equivalent (M.B.) to the American M.D. I have never practiced medicine (including psychiatry) in the United States or abroad. I have testified in dozens of federal and state legal proceedings and regulatory hearings, in

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most cases reviewing scientific literature to clarify the issues under examination. I strongly support equality and oppose discrimination for the LGBT community, and I have testified on their behalf as a statistical expert.

I have been a full-time tenured professor for over four decades. I have held professorial appointments at eight universities, including Princeton, the University of Pennsylvania, Stanford, Arizona State University, Johns Hopkins University Bloomberg School of Public Health and School of Medicine, Ohio State, Virginia Tech, and the University of Michigan. I have also held research faculty appointments at several other institutions, including the Mayo Clinic.

My full-time and part-time appointments have been in twenty-three disciplines, including statistics, biostatistics, epidemiology, public health, social methodology, psychiatry, mathematics, sociology, political science, economics, and biomedical informatics. But my research interests have varied far less than my academic appointments: the focus of my career has been to learn how statistics and models are employed across disciplines, with the goal of improving the use of models and data analytics in assessing issues of interest in the policy, regulatory, or legal realms.

I have been published in many top-tier peer-reviewed journals (including *The Annals of Statistics*, *Biometrics*, and *American Journal of Political Science*) and have reviewed hundreds of manuscripts submitted for publication to many of the major medical, statistical, and epidemiological journals (including *The New England Journal of Medicine*, *Journal of the American Statistical Association*, and *American Journal of Public Health*).

I am currently a scholar in residence in the Department of Psychiatry at Johns Hopkins School of Medicine and a professor of statistics and biostatistics at Arizona State University. Up until July 1, 2016, I also held part-time faculty appointments at the Johns Hopkins Bloomberg School of Public Health and School of Medicine, and at the Mayo Clinic.

An undertaking as ambitious as this report would not be possible without the counsel and advice of many gifted scholars and editors. I am grateful for the generous help of Laura E. Harrington, M.D., M.S., a psychiatrist with extensive training in internal medicine and neuroimmunology, whose clinical practice focuses on women in life transition, including affirmative treatment and therapy for the LGBT community. She contributed to the entire report, particularly lending her expertise to the sections on endocrinology and brain research. I am indebted also to Bentley J. Hanish, B.S., a young geneticist who expects to graduate medical school in 2021 with an M.D./Ph.D. in psychiatric epidemiology.

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He contributed to the entire report, particularly to those sections that concern genetics.

I gratefully acknowledge the support of Johns Hopkins University Bloomberg School of Public Health and School of Medicine, Arizona State University, and the Mayo Clinic.

In the course of writing this report, I consulted a number of individuals who asked that I not thank them by name. Some feared an angry response from the more militant elements of the LGBT community; others feared an angry response from the more strident elements of religiously conservative communities. Most bothersome, however, is that some feared reprisals from their own universities for engaging such controversial topics, regardless of the report's content—a sad statement about academic freedom.

I dedicate my work on this report, first, to the LGBT community, which bears a disproportionate rate of mental health problems compared to the population as a whole. We must find ways to relieve their suffering.

I dedicate it also to scholars doing impartial research on topics of public controversy. May they never lose their way in political hurricanes.

And above all, I dedicate it to children struggling with their sexuality and gender. Children are a special case when addressing gender issues. In the course of their development, many children explore the idea of being of the opposite sex. Some children may have improved psychological well-being if they are encouraged and supported in their cross-gender identification, particularly if the identification is strong and persistent over time. But nearly all children ultimately identify with their biological sex. The notion that a two-year-old, having expressed thoughts or behaviors identified with the opposite sex, can be labeled for life as transgender has absolutely no support in science. Indeed, it is iniquitous to believe that all children who have gender-atypical thoughts or behavior at some point in their development, particularly before puberty, should be encouraged to become transgender.

As citizens, scholars, and clinicians concerned with the problems facing LGBT people, we should not be dogmatically committed to any particular views about the nature of sexuality or gender identity; rather, we should be guided first and foremost by the needs of struggling patients, and we should seek with open minds for ways to help them lead meaningful, dignified lives.

LAWRENCE S. MAYER, M.B., M.S., Ph.D.

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## Executive Summary

This report presents a careful summary and an up-to-date explanation of research—from the biological, psychological, and social sciences—related to sexual orientation and gender identity. It is offered in the hope that such an exposition can contribute to our capacity as physicians, scientists, and citizens to address health issues faced by LGBT populations within our society.

Some key findings:

### **Part One: Sexual Orientation**

- The understanding of sexual orientation as an innate, biologically fixed property of human beings—the idea that people are “born that way”—is not supported by scientific evidence.
- While there is evidence that biological factors such as genes and hormones are associated with sexual behaviors and attractions, there are no compelling causal biological explanations for human sexual orientation. While minor differences in the brain structures and brain activity between homosexual and heterosexual individuals have been identified by researchers, such neurobiological findings do not demonstrate whether these differences are innate or are the result of environmental and psychological factors.
- Longitudinal studies of adolescents suggest that sexual orientation may be quite fluid over the life course for some people, with one study estimating that as many as 80% of male adolescents who report same-sex attractions no longer do so as adults (although the extent to which this figure reflects actual changes in same-sex attractions and not just artifacts of the survey process has been contested by some researchers).
- Compared to heterosexuals, non-heterosexuals are about two to three times as likely to have experienced childhood sexual abuse.

EXECUTIVE SUMMARY

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**Part Two: Sexuality, Mental Health Outcomes, and Social Stress**

- Compared to the general population, non-heterosexual sub-populations are at an elevated risk for a variety of adverse health and mental health outcomes.
- Members of the non-heterosexual population are estimated to have about 1.5 times higher risk of experiencing anxiety disorders than members of the heterosexual population, as well as roughly double the risk of depression, 1.5 times the risk of substance abuse, and nearly 2.5 times the risk of suicide.
- Members of the transgender population are also at higher risk of a variety of mental health problems compared to members of the non-transgender population. Especially alarmingly, the rate of lifetime suicide attempts across all ages of transgender individuals is estimated at 41%, compared to under 5% in the overall U.S. population.
- There is evidence, albeit limited, that social stressors such as discrimination and stigma contribute to the elevated risk of poor mental health outcomes for non-heterosexual and transgender populations. More high-quality longitudinal studies are necessary for the “social stress model” to be a useful tool for understanding public health concerns.

**Part Three: Gender Identity**

- The hypothesis that gender identity is an innate, fixed property of human beings that is independent of biological sex—that a person might be “a man trapped in a woman’s body” or “a woman trapped in a man’s body”—is not supported by scientific evidence.
  - According to a recent estimate, about 0.6% of U.S. adults identify as a gender that does not correspond to their biological sex.
  - Studies comparing the brain structures of transgender and non-transgender individuals have demonstrated weak correlations between brain structure and cross-gender identification. These correlations do not provide any evidence for a neurobiological basis for cross-gender identification.
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- Compared to the general population, adults who have undergone sex-reassignment surgery continue to have a higher risk of experiencing poor mental health outcomes. One study found that, compared to controls, sex-reassigned individuals were about 5 times more likely to attempt suicide and about 19 times more likely to die by suicide.
- Children are a special case when addressing transgender issues. Only a minority of children who experience cross-gender identification will continue to do so into adolescence or adulthood.
- There is little scientific evidence for the therapeutic value of interventions that delay puberty or modify the secondary sex characteristics of adolescents, although some children may have improved psychological well-being if they are encouraged and supported in their cross-gender identification. There is no evidence that all children who express gender-atypical thoughts or behavior should be encouraged to become transgender.

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# Sexuality and Gender

## Findings from the Biological, Psychological, and Social Sciences

*Lawrence S. Mayer, M.B., M.S., Ph.D. and Paul R. McHugh, M.D.*

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### Introduction

Few topics are as complex and controversial as human sexual orientation and gender identity. These matters touch upon our most intimate thoughts and feelings, and help to define us as both individuals and social beings. Discussions of the ethical questions raised by sexual orientation and gender identity can become heated and personal, and the associated policy issues sometimes provoke intense controversies. The disputants, journalists, and lawmakers in these debates often invoke the authority of science, and in our news and social media and our broader popular culture we hear claims about what “science says” on these matters.

**This report offers a careful summary and an up-to-date explanation of many of the most rigorous findings produced by the biological, psychological, and social sciences related to sexual orientation and gender identity.** We examine a vast body of scientific literature from several disciplines. We try to acknowledge the limitations of the research and to avoid premature conclusions that would result in over-interpretation of scientific findings. Since the relevant literature is rife with inconsistent and ambiguous definitions, we not only examine the empirical evidence but also delve into underlying conceptual problems. This report does not, however, discuss matters of morality or policy; our focus is on the scientific evidence—what it shows and what it does not show.

We begin in Part One by critically examining whether concepts such as heterosexuality, homosexuality, and bisexuality represent distinct, fixed, and biologically determined properties of human beings. As part of this discussion, we look at the popular “born that way” hypothesis, which

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## INTRODUCTION

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posits that human sexual orientation is biologically innate; we examine the evidence for this claim across several subspecialties of the biological sciences. We explore the developmental origins of sexual attractions, the degree to which such attractions may change over time, and the complexities inherent in the incorporation of these attractions into one's sexual identity. Drawing on evidence from twin studies and other types of research, we explore genetic, environmental, and hormonal factors. We also explore some of the scientific evidence relating brain science to sexual orientation.

In Part Two we examine research on health outcomes as they relate to sexual orientation and gender identity. There is a consistently observed higher risk of poor physical and mental health outcomes for lesbian, gay, bisexual, and transgender subpopulations compared to the general population. These outcomes include depression, anxiety, substance abuse, and most alarmingly, suicide. For example, among the transgender subpopulation in the United States, the rate of attempted suicide is estimated to be as high as 41%, ten times higher than in the general population. As physicians, academics, and scientists, we believe all of the subsequent discussions in this report must be cast in the light of this public health issue.

We also examine some ideas proposed to explain these differential health outcomes, including the “social stress model.” This hypothesis—which holds that stressors like stigma and prejudice account for much of the additional suffering observed in these subpopulations—does not seem to offer a complete explanation for the disparities in the outcomes.

Much as Part One investigates the conjecture that sexual orientation is fixed with a causal biological basis, a portion of Part Three examines similar issues with respect to gender identity. Biological sex (the binary categories of male and female) is a fixed aspect of human nature, even though some individuals affected by disorders of sex development may exhibit ambiguous sex characteristics. By contrast, gender identity is a social and psychological concept that is not well defined, and there is little scientific evidence that it is an innate, fixed biological property.

Part Three also examines sex-reassignment procedures and the evidence for their effectiveness at alleviating the poor mental health outcomes experienced by many people who identify as transgender. Compared to the general population, postoperative transgender individuals continue to be at high risk of poor mental health outcomes.

An area of particular concern involves medical interventions for gender-nonconforming youth. They are increasingly receiving therapies that affirm their felt genders, and even hormone treatments or surgical

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modifications at young ages. But the majority of children who identify as a gender that does not conform to their biological sex will no longer do so by the time they reach adulthood. We are disturbed and alarmed by the severity and irreversibility of some interventions being publicly discussed and employed for children.

Sexual orientation and gender identity resist explanation by simple theories. There is a large gap between the certainty with which beliefs are held about these matters and what a sober assessment of the science reveals. In the face of this complexity and uncertainty, we need to be humble about what we know and do not know. We readily acknowledge that this report is neither an exhaustive analysis of the subjects it addresses nor the last word on them. Science is by no means the only avenue for understanding these astoundingly complex, multifaceted topics; there are other sources of wisdom and knowledge—including art, religion, philosophy, and lived human experience. And much of our scientific knowledge in this area remains unsettled. However, we offer this overview of the scientific literature in the hope that it can provide a shared framework for intelligent, enlightened discourse in political, professional, and scientific exchanges—and may add to our capacity as concerned citizens to alleviate suffering and promote human health and flourishing.

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*Part One*

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## Sexual Orientation

*While some people are under the impression that sexual orientation is an innate, fixed, and biological trait of human beings—that, whether heterosexual, homosexual, or bisexual, we are “born that way”—there is insufficient scientific evidence to support that claim. In fact, the concept of sexual orientation itself is highly ambiguous; it can refer to a set of behaviors, to feelings of attraction, or to a sense of identity. Epidemiological studies show a rather modest association between genetic factors and sexual attractions or behaviors, but do not provide significant evidence pointing to particular genes. There is also evidence for other hypothesized biological causes of homosexual behaviors, attractions, or identity—such as the influence of hormones on prenatal development—but that evidence, too, is limited. Studies of the brains of homosexuals and heterosexuals have found some differences, but have not demonstrated that these differences are inborn rather than the result of environmental factors that influenced both psychological and neurobiological traits. One environmental factor that appears to be correlated with non-heterosexuality is childhood sexual abuse victimization, which may also contribute to the higher rates of poor mental health outcomes among non-heterosexual subpopulations, compared to the general population. Overall, the evidence suggests some measure of fluidity in patterns of sexual attraction and behavior—contrary to the “born that way” notion that oversimplifies the vast complexity of human sexuality.*

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The popular discussion of sexual orientation is characterized by two conflicting ideas about why some individuals are lesbian, gay, or bisexual. While some claim that sexual orientation is a choice, others say that sexual orientation is a fixed feature of one’s nature, that one is “born that way.” We hope to show here that, though sexual orientation is not a choice, neither is there scientific evidence for the view that sexual orientation is a fixed and innate biological property.

A prominent recent example of a person describing sexual orientation as a choice is Cynthia Nixon, a star of the popular television series *Sex and the City*, who in a January 2012 *New York Times* interview explained, “For me it’s a choice, and you don’t get to define my gayness for me,” and commented that she was “very annoyed” about the issue of whether or not gay people are born that way. “Why can’t it be a choice? Why is that any less legitimate?”<sup>1</sup> Similarly, Brandon Ambrosino wrote in *The New Republic* in

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2014 that “It’s time for the LGBT community to stop fearing the word ‘choice,’ and to reclaim the dignity of sexual autonomy.”<sup>2</sup>

By contrast, proponents of the “born that way” hypothesis—expressed for instance in Lady Gaga’s 2011 song “Born This Way”—posit that there is a causal biological basis for sexual orientation and often try to bolster their claims with scientific findings. Citing three scientific studies<sup>3</sup> and an article from *Science* magazine,<sup>4</sup> Mark Joseph Stern, writing for *Slate* in 2014, claims that “homosexuality, at least in men, is clearly, undoubtedly, inarguably an inborn trait.”<sup>5</sup> However, as neuroscientist Simon LeVay, whose work in 1991 showed brain differences in homosexual men compared to heterosexual men, explained some years after his study, “It’s important to stress what I didn’t find. I did not prove that homosexuality is genetic, or find a genetic cause for being gay. I didn’t show that gay men are ‘born that way,’ the most common mistake people make in interpreting my work. Nor did I locate a gay center in the brain.”<sup>6</sup>

Many recent books contain popular treatments of science that make claims about the innateness of sexual orientation. These books often exaggerate—or at least oversimplify—complex scientific findings. For example, in a 2005 book, psychologist and science writer Leonard Sax responds to a worried mother’s question as to whether her teenage son will outgrow his homosexual attractions: “Biologically, the difference between a gay man and a straight man is something like the difference between a left-handed person and a right-handed person. Being left-handed isn’t just a phase. A left-handed person won’t someday magically turn into a right-handed person. . . . Some children are destined at birth to be left-handed, and some boys are destined at birth to grow up to be gay.”<sup>7</sup>

As we argue in this part of the report, however, there is little scientific evidence to support the claim that sexual attraction is simply fixed by innate and deterministic factors such as genes. Popular understandings of scientific findings often presume deterministic causality when the findings do not warrant that presumption.

Another important limitation for research and for interpretation of scientific studies on this topic is that some central concepts—including “sexual orientation” itself—are often ambiguous, making reliable measurements difficult both within individual studies and when comparing results across studies. So before turning to the scientific evidence concerning the development of sexual orientation and sexual desire, we will examine at some length several of the most troublesome conceptual ambiguities in the study of human sexuality in order to arrive at a fuller picture of the relevant concepts.

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PART ONE: SEXUAL ORIENTATION

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**Problems with Defining Key Concepts**

A 2014 *New York Times Magazine* piece titled “The Scientific Quest to Prove Bisexuality Exists”<sup>8</sup> provides an illustration of the themes explored in this Part—sexual desire, attraction, orientation, and identity—and of the difficulties with defining and studying these concepts. Specifically, the article shows how a scientific approach to studying human sexuality can conflict with culturally prevalent views of sexual orientation, or with the self-understanding that many people have of their own sexual desires and identities. Such conflicts raise important questions about whether sexual orientation and related concepts are as coherent and well-defined as is often assumed by researchers and the public alike.

The author of the article, Benoit Denizet-Lewis, an openly gay man, describes the work of scientists and others trying to demonstrate the existence of a stable bisexual orientation. He visited researchers at Cornell University and participated in tests used to measure sexual arousal, tests that include observing the way pupils dilate in response to sexually explicit imagery. To his surprise, he found that, according to this scientific measure, he was aroused when watching pornographic films of women masturbating:

Might I actually be bisexual? Have I been so wedded to my gay identity—one I adopted in college and announced with great fanfare to family and friends—that I haven’t allowed myself to experience another part of myself? In some ways, even asking those questions is anathema to many gays and lesbians. That kind of publicly shared uncertainty is catnip to the Christian Right and to the scientifically dubious, psychologically damaging ex-gay movement it helped spawn. As out gay men and lesbians, after all, we’re supposed to be sure—we’re supposed to be “born this way.”<sup>9</sup>

Despite the apparently scientific (though admittedly limited) evidence of his bisexual-typical patterns of arousal, Denizet-Lewis rejected the idea that he was actually bisexual, because “It doesn’t feel true as a sexual orientation, nor does it feel right as my identity.”<sup>10</sup>

Denizet-Lewis’s concerns here illustrate a number of the quandaries raised by the scientific study of human sexuality. The objective measures the researchers used seemed to be at odds with the more intuitive, subjective understanding of what it is to be sexually aroused; our own understanding of what we are sexually aroused by is tied up with the entirety of our lived experience of sexuality. Furthermore, Denizet-Lewis’s insistence

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that he is gay, not bisexual, and his concern that uncertainty about his identity could have social and political implications, points to the fact that sexual orientation and identity are understood not only in scientific and personal terms, but in social, moral, and political terms as well.

But how do categories of sexual orientation—with labels such as “bisexual” or “gay” or “straight”—help scientists study the complex phenomenon of human sexuality? When we examine the concept of sexual orientation, it becomes apparent, as this part will show, that it is too vague and poorly defined to be very useful in science, and that in its place we need more clearly defined concepts. We strive in this report to use clear terms; when discussing scientific studies that rely on the concept of “sexual orientation,” we try as much as possible to specify how the scientists defined the term, or related terms.

One of the central difficulties in examining and researching sexual orientation is that the underlying concepts of “sexual desire,” “sexual attraction,” and “sexual arousal” can be ambiguous, and it is even less clear what it means that a person identifies as having a sexual orientation grounded in some pattern of desires, attractions, or states of arousal.

The word “desire” all by itself might be used to cover an aspect of volition more naturally expressed by “want”: I want to go out for dinner, or to take a road trip with my friends next summer, or to finish this project. When “desire” is used in this sense, the objects of desire are fairly determinate *goals*—some may be perfectly achievable, such as moving to a new city or finding a new job; others may be more ambitious and out of reach, like the dream of becoming a world-famous movie star. Often, however, the language of desire is meant to include things that are less clear: indefinite *longings* for a life that is, in some unspecified sense, different or better; an inchoate sense of something being missing or lacking in oneself or one’s world; or, in psychoanalytic literature, unconscious dynamic forces that shape one’s cognitive, emotional, and social behaviors, but that are separate from one’s ordinary, conscious sense of self.

This more full-blooded notion of desire is, itself, ambiguous. It might refer to a hoped-for state of affairs like finding a sense of meaning, fulfillment, and satisfaction with one’s life, a desire that, while not completely clear in its implications, is presumably not entirely out of reach, although such longings may also be forms of fantasizing about a radically altered or perhaps even unattainable state of affairs. If I want to take a road trip with my friends, the steps are clear: call up my friends, pick a date, map out a route, and so on. However, if I have an inchoate longing for change, a hope for sustainable intimacy, love, and belonging, or an unconscious conflict

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that is disrupting my ability to move forward in the life I have tried to build for myself, I face a different sort of challenge. There is not necessarily a set of well-defined or conscious goals, much less established ways of achieving them. This is not to say that the satisfaction of these longings is impossible, but doing so often involves not only choosing concrete actions to achieve particular goals but the more complex shaping of one's own life through acting in and making sense of the world and one's place in it.

So the first thing to note when considering both popular discussions and scientific studies of sexuality is that the use of the term "desire" could refer to distinct aspects of human life and experience.

Just as the meanings that might be intended by the term "desire" are many, so also is each of these meanings varied, making clear delineations a challenge. For example, a commonsense understanding might suggest that the term "sexual desire" means wanting to engage in specific sexual acts with particular individuals (or categories of individuals). Psychiatrist Steven Levine articulated this common view in his definition of sexual desire as "the sum of the forces that incline us toward and away from sexual behavior."<sup>11</sup> But it is not obvious how one might study this "sum" in a rigorous way. Nor is it obvious why all the diverse factors that can potentially influence sexual behavior, such as material poverty—in the case of prostitution, for instance—alcohol consumption, and intimate affection, should all be grouped together as aspects of sexual desire. As Levine himself points out, "In anyone's hands, sexual desire can be a slippery concept."<sup>12</sup>

Consider a few of the ways that the term "sexual desire" has been employed in scientific contexts—designating one or more of the following distinct phenomena:

1. States of physical arousal that may or may not be linked to a specific physical activity and may or may not be objects of conscious awareness.
2. Conscious erotic interest in response to finding others attractive (in perception, memory, or fantasy), which may or may not involve any of the bodily processes associated with measurable states of physical arousal.
3. Strong interest in finding a companion or establishing a durable relationship.
4. The romantic aspirations and feelings associated with infatuation or falling in love with a specific individual.

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5. Inclination towards attachment to specific individuals.
6. The general motivation to seek intimacy with a member of some specific group.
7. An aesthetic measure that latches onto perceived beauty in others.<sup>13</sup>

In a given social science study, the concepts mentioned above will often each have its own particular operational definition for the purposes of research. But they cannot all mean the *same* thing. Strong interest in finding a companion, for example, is clearly distinguishable from physical arousal. Looking at this list of experiential and psychological phenomena, one can easily envision what confusions might arise from using the term “sexual desire” without sufficient care.

The philosopher Alexander Pruss provides a helpful summary of some of the difficulties involved in characterizing the related concept of sexual attraction:

What does it mean to be “sexually attracted” to someone? Does it mean to have a tendency to be aroused in their presence? But surely it is possible to find someone sexually attractive without being aroused. Does it mean to form the belief that someone is sexually attractive to one? Surely not, since a belief about who is sexually attractive to one might be wrong—for instance, one might confuse admiration of form with sexual attraction. Does it mean to have a noninstrumental desire for a sexual or romantic relationship with the person? Probably not: we can imagine a person who has no sexual attraction to anybody, but who has a noninstrumental desire for a romantic relationship because of a belief, based on the testimony of others, that romantic relationships have noninstrumental value. These and similar questions suggest that there is a cluster of related concepts under the head of “sexual attraction,” and any precise definition is likely to be an undesirable shoehorning. But if the concept of sexual attraction is a cluster of concepts, neither are there simply univocal concepts of heterosexuality, homosexuality, and bisexuality.<sup>14</sup>

The ambiguity of the term “sexual desire” (and similar terms) should give us pause to consider the diverse aspects of human experience that are often associated with it. The problem is neither irresolvable nor unique to this subject matter. Other social science concepts—aggression and addiction, for example—may likewise be difficult to define and to

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operationalize and for this reason admit of various usages.\* Nevertheless, the ambiguity presents a significant challenge for both research design and interpretation, requiring that we take care in attending to the meanings, contexts, and findings specific to each study. It is also important to bracket any subjective associations with or uses of these terms that do not conform to well-defined scientific classifications and techniques.

It would be a mistake, at any rate, to ignore the varied uses of this and related terms or to try to reduce the many and distinct experiences to which they might refer to a single concept or experience. As we shall see, doing so could in some cases adversely affect the evaluation and treatment of patients.

### **The Context of Sexual Desire**

We can further clarify the complex phenomenon of sexual desire if we examine what relationship it has to other aspects of our lives. To do so, we borrow some conceptual tools from a philosophical tradition known as phenomenology, which conceives of human experience as deriving its meaning from the whole context in which it appears.

The testimony of experience suggests that one's experience of sexual desire and sexual attraction is not voluntary, at least not in any immediate way. The whole set of inclinations that we generally associate with the experience of sexual desire—whether the impulse to engage in particular acts or to enjoy certain relationships—does not appear to be the sole product of any deliberate choice. Our sexual appetites (like other natural appetites) are experienced as given, even if their expression is shaped in subtle ways by many factors, which might very well include volition. Indeed, far from appearing as a product of our will, sexual desire—however we define it—is often experienced as a powerful force, akin to hunger, that many struggle (especially in adolescence) to bring under direction and control. Furthermore, sexual desire can impact one's attention involuntarily or color one's day-to-day perceptions, experiences, and encounters. What seems to be to some extent in our control is how we choose to live with this appetite, how we integrate it into the rest of our lives.

But the question remains: What *is* sexual desire? What is this part of our lives that we consider to be given, prior even to our capacity to

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\* "Operationalizing" refers to the way social scientists make a variable measurable. Homosexuality may be operationalized as the answers that survey respondents give to questions about their sexual orientation. Or it could be operationalized as answers to questions about their desires, attractions, and behavior. Operationalizing variables in ways that will reliably measure the trait or behavior being studied is a difficult but important part of any social science research.

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deliberate and make rational choices about it? We know that some sort of sexual appetite is present in non-human animals, as is evident in the mammalian estrous cycle; in most mammalian species sexual arousal and receptivity are linked to the phase of the ovulation cycle during which the female is reproductively receptive.<sup>15</sup> One of the relatively unique features of *Homo sapiens*, shared with only a few other primates, is that sexual desire is not exclusively linked to the woman's ovulatory cycle.<sup>16</sup> Some biologists have argued that this means that sexual desire in humans has evolved to facilitate the formation of sustaining relationships between parents, in addition to the more basic biological purpose of reproduction. Whatever the explanation for the origins and biological functions of human sexuality, the lived experience of sexual desires is laden with significance that goes beyond the biological purposes that sexual desires and behaviors serve. This significance is not just a subjective add-on to the more basic physiological and functional realities, but something that pervades our lived experience of sexuality.

As philosophers who study the structure of conscious experience have observed, our way of experiencing the world is shaped by our “embodiment, bodily skills, cultural context, language and other social practices.”<sup>17</sup> Long before most of us experience anything like what we typically associate with sexual desire, we are already enmeshed in a cultural and social context involving other persons, feelings, emotions, opportunities, deprivations, and so on. Perhaps sexuality, like other human phenomena that gradually become part of our psychological constitution, has roots in these early meaning-making experiences. If meaning-making is integral to human experience in general, it is likely to play a key role in sexual experience in particular. And given that volition is operative in these other aspects of our lives, it stands to reason that volition will be operative in our experience of sexuality too, if only as one of many other factors.

This is not to suggest that sexuality—including sexual desire, attraction, and identity—is the result of any deliberate, rational decision calculus. Even if volition plays an important role in sexuality, volition itself is quite complex: many, perhaps most, of our volitional choices do not seem to come in the form of discrete, conscious, or deliberate decisions; “volitional” does not necessarily mean “deliberate.” The life of a desiring, volitional agent involves many tacit patterns of behavior owing to habits, past experiences, memories, and subtle ways of adopting and abandoning different stances on one's life.

If something like this way of understanding the life of a desiring, volitional agent is true, then we do not deliberately “choose” the objects of our

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sexual desires any more than we choose the objects of our other desires. It might be more accurate to say that we gradually guide and give ourselves over to them over the course of our growth and development. This process of forming and reforming ourselves as human beings is similar to what Abraham Maslow calls self-actualization.<sup>18</sup> Why should sexuality be an exception to this process? In the picture we are offering, internal factors, such as our genetic make-up, and external environmental factors, such as past experiences, are only ingredients, however important, in the complex human experience of sexual desire.

### Sexual Orientation

Just as the concept of “sexual desire” is complex and difficult to define, there are currently no agreed-upon definitions of “sexual orientation,” “homosexuality,” or “heterosexuality” for purposes of empirical research. Should homosexuality, for example, be characterized by reference to desires to engage in particular acts with individuals of the same sex, or to a patterned history of having engaged in such acts, or to particular features of one’s private wishes or fantasies, or to a consistent impulse to seek intimacy with members of the same sex, or to a social identity imposed by oneself or others, or to something else entirely?

As early as 1896, in a book on homosexuality, the French thinker Marc-André Raffalovich argued that there were more than ten different types of affective inclination or behavior captured by the term “homosexuality” (or what he called “unisexuality”).<sup>19</sup> Raffalovich knew his subject matter up close: he chronicled the trial, imprisonment, and resulting social disgrace of the writer Oscar Wilde, who had been prosecuted for “gross indecency” with other men. Raffalovich himself maintained a prolonged and intimate relationship with John Gray, a man of letters thought to be the inspiration for Wilde’s classic *The Picture of Dorian Gray*.<sup>20</sup> We might also consider the vast psychoanalytic literature from the early twentieth century on the topic of sexual desire, in which the experiences of individual subjects and their clinical cases are catalogued in great detail. These historical examples bring into relief the complexity that researchers still face today when attempting to arrive at clean categorizations of the richly varied affective and behavioral phenomena associated with sexual desire, in both same-sex and opposite-sex attractions.

We may contrast such inherent complexity with a different phenomenon that can be delineated unambiguously, such as pregnancy. With very few exceptions, a woman is or is not pregnant, which makes classification

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of research subjects for the purposes of study relatively easy: compare pregnant women with other, non-pregnant women. But how can researchers compare, say, “gay” men to “straight” men in a single study, or across a range of studies, without mutually exclusive and exhaustive definitions of the terms “gay” and “straight”?

To increase precision, some researchers categorize concepts associated with human sexuality along a continuum or scale according to variations in pervasiveness, prominence, or intensity. Some scales focus on both intensity and the objects of sexual desire. Among the most familiar and widely used is the Kinsey scale, developed in the 1940s to classify sexual desires and orientations using purportedly measurable criteria. People are asked to choose one of the following options:

- 0 - Exclusively heterosexual
- 1 - Predominantly heterosexual, only incidentally homosexual
- 2 - Predominantly heterosexual, but more than incidentally homosexual
- 3 - Equally heterosexual and homosexual
- 4 - Predominantly homosexual, but more than incidentally heterosexual
- 5 - Predominantly homosexual, only incidentally heterosexual
- 6 - Exclusively homosexual<sup>21</sup>

But there are considerable limitations to this approach. In principle, measurements of this sort are valuable for social science research. They can be used, for example, in empirical tests such as the classic “t-test,” which helps researchers measure statistically meaningful differences between data sets. Many measurements in social science, however, are “ordinal,” meaning that variables are rank-ordered along a single, one-dimensional continuum but are not intrinsically significant beyond that. In the case of the Kinsey scale, this situation is even worse, because it measures the self-identification of individuals, while leaving unclear whether the values they report all refer to the same aspect of sexuality—different people may understand the terms “heterosexual” and “homosexual” to refer to feelings of attraction, or to arousal, or to fantasies, or to behavior, or to any combination of these. The ambiguity of the terms severely limits the use of the Kinsey scale as an ordinal measurement that gives a rank order to variables along a single, one-dimensional continuum. So it is not clear that this scale helps researchers to make even rudimentary classifications among the relevant groups using qualitative criteria, much less to rank-order variables or conduct controlled experiments.

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Perhaps, given the inherent complexity of the subject matter, attempts to devise “objective” scales of this sort are misguided. In a critique of such approaches to social science, philosopher and neuropsychologist Daniel N. Robinson points out that “statements that lend themselves to different interpretation do not become ‘objective’ merely by putting a numeral in front of them.”<sup>22</sup> It may be that self-reported identifications with culturally fraught and inherently complex labels simply cannot provide an objective basis for quantitative measurements in individuals or across groups.

Another obstacle for research in this area may be the popular, but not well-supported, belief that romantic desires are sublimations of sexual desires. This idea, traceable to Freud’s theory of unconscious drives, has been challenged by research on “attachment theory,” developed by John Bowlby in the 1950s.<sup>23</sup> Very roughly, attachment theory holds that later affective experiences that are often grouped under the general rubric “romantic” are explained in part by early childhood attachment behaviors (associated with maternal figures or caregivers)—not by unconscious, sexual drives. Romantic desires, following this line of thought, might not be as strongly correlated with sexual desires as is commonly thought. All of this is to suggest that simple delineations of the concepts relating to human sexuality cannot be taken at face value and that ongoing empirical research sometimes changes or complicates the meanings of the concepts.

If we look at recent research, we find that scientists often use at least one of three categories when attempting to classify people as “homosexual” or “heterosexual”: sexual *behavior*; sexual *fantasies* (or related emotional or affective experiences); and *self-identification* (as “gay,” “lesbian,” “bisexual,” “asexual,” and so forth).<sup>24</sup> Some add a fourth: inclusion in a community defined by sexual orientation. Consider, for example, the American Psychological Association’s definition of sexual orientation in a 2008 document designed to educate the public:

Sexual orientation refers to an enduring pattern of emotional, romantic and/or sexual *attractions* to men, women or both sexes. Sexual orientation also refers to a person’s sense of *identity* based on those attractions, related *behaviors*, and membership in a *community* of others who share those attractions. Research over several decades has demonstrated that sexual orientation ranges along a *continuum*, from exclusive attraction to the other sex to exclusive attraction to the same sex.<sup>25</sup> [Emphases added.]

One difficulty with grouping these categories together under the same general rubric of “sexual orientation” is that research suggests they often

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do not coincide in real life. Sociologist Edward O. Laumann and colleagues summarize this point clearly in a 1994 book:

While there is a core group (about 2.4 percent of the total men and about 1.3 percent of the total women) in our survey who *define themselves* as homosexual or bisexual, have same-gender *partners*, and express homosexual *desires*, there are also sizable groups who do not consider themselves to be either homosexual or bisexual but have had adult homosexual experiences or express some degree of desire.... [T]his preliminary analysis provides unambiguous evidence that no single number can be used to provide an accurate and valid characterization of the incidence and prevalence of homosexuality in the population at large. In sum, homosexuality is fundamentally a multidimensional phenomenon that has manifold meanings and interpretations, depending on context and purpose.<sup>26</sup> [Emphases added.]

More recently, in a 2002 study, psychologists Lisa M. Diamond and Ritch C. Savin-Williams make a similar point:

The more carefully researchers map these constellations—differentiating, for example, between *gender identity* and *sexual identity*, *desire* and *behavior*, *sexual* versus *affectionate* feelings, early-appearing versus late-appearing *attractions* and *fantasies*, or social *identifications* and sexual *profiles*—the more complicated the picture becomes because few individuals report uniform inter-correlations among these domains.<sup>27</sup> [Emphases added.]

Some researchers acknowledge the difficulties with grouping these various components under a single rubric. For example, researchers John C. Gonsiorek and James D. Weinrich write in a 1991 book: “It can be safely assumed that there is no necessary relationship between a person’s sexual behavior and self-identity unless both are individually assessed.”<sup>28</sup> Likewise, in a 1999 review of research on the development of sexual orientation in women, social psychologist Letitia Anne Peplau argues: “There is ample documentation that same-sex attractions and behaviors are not inevitably or inherently linked to one’s identity.”<sup>29</sup>

In sum, the complexities surrounding the concept of “sexual orientation” present considerable challenges for empirical research on the subject. While the general public may be under the impression that there are widely accepted scientific definitions of terms such as “sexual orientation,” in fact, there are not. Diamond’s assessment of the situation in 2003 is still true today, that “there is currently no scientific or popular consensus on

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the exact constellation of experiences that definitively ‘qualify’ an individual as lesbian, gay, or bisexual.”<sup>30</sup>

It is owing to such complexities that some researchers, for instance Laumann, proceed by characterizing sexual orientation as a “multidimensional phenomenon.” But one might just as well wonder whether, in trying to shoehorn this “multidimensional phenomenon” into a single category, we are not reifying a concept that corresponds to something far too plastic and diffuse in reality to be of much value in scientific research. While labels such as “heterosexual” and “homosexual” are often taken to designate stable psychological or even biological traits, perhaps they do not. It may be that individuals’ affective, sexual, and behavioral experiences do not conform well to such categorical labels because these labels do not, in fact, refer to natural (psychological or biological) kinds. At the very least, we should recognize that we do not yet possess a clear and well-established framework for research on these topics. Rather than attempting to research sexual desire, attraction, identity, and behavior under the general rubric of “sexual orientation,” we might do better to examine empirically each domain separately and in its own specificity.

To that end, this part of our report considers research on sexual desire and sexual attraction, focusing on the empirical findings related to etiology and development, and highlighting the underlying complexities. We will continue to employ ambiguous terms like “sexual orientation” where they are used by the authors we discuss, but we will try to be attentive to the context of their use and the ambiguities attaching to them.

### **Challenging the “Born that Way” Hypothesis**

Keeping in mind these reflections on the problems of definitions, we turn to the question of how sexual desires originate and develop. Consider the different patterns of attraction between individuals who report experiencing predominant sexual or romantic attraction toward members of the same sex and those who report experiencing predominant sexual or romantic attraction toward members of the opposite sex. What are the causes of these two patterns of attraction? Are such attractions or preferences innate traits, perhaps determined by our genes or prenatal hormones; are they acquired by experiential, environmental, or volitional factors; or do they develop out of some combination of both kinds of causes? What role, if any, does human agency play in the genesis of patterns of attraction? What role, if any, do cultural or social influences play?

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Research suggests that while genetic or innate factors may influence the emergence of same-sex attractions, these biological factors cannot provide a complete explanation, and environmental and experiential factors may also play an important role.

The most commonly accepted view in popular discourse we mentioned above—the “born that way” notion that homosexuality and heterosexuality are biologically innate or the product of very early developmental factors—has led many non-specialists to think that homosexuality or heterosexuality is in any given person unchangeable and determined entirely apart from choices, behaviors, life experiences, and social contexts. However, as the following discussion of the relevant scientific literature shows, this is not a view that is well-supported by research.

### Studies of Twins

One powerful research design for assessing whether biological or psychological traits have a genetic basis is the study of identical twins. If the probability is high that both members in a pair of identical twins, who share the same genome, exhibit a trait when one of them does—this is known as the concordance rate—then one can infer that genetic factors are likely to be involved in the trait. If, however, the concordance rate for identical twins is no higher than the concordance rate of the same trait in fraternal twins, who share (on average) only half their genes, this indicates that the shared environment may be a more important factor than shared genes.

One of the pioneers of behavioral genetics and one of the first researchers to use twins to study the effect of genes on traits, including sexual orientation, was psychiatrist Franz Josef Kallmann. In a landmark paper published in 1952, he reported that for all the pairs of identical twins he studied, if one of the twins was gay then both were gay, yielding an astonishing 100% concordance rate for homosexuality in identical twins.<sup>31</sup> Were this result replicated and the study designed better, it would have given early support to the “born that way” hypothesis. But the study was heavily criticized. For example, philosopher and law professor Edward Stein notes that Kallmann did not present any evidence that the twins in his study were in fact genetically identical, and his sample was drawn from psychiatric patients, prisoners, and others through what Kallmann described as “direct contacts with the clandestine homosexual world,” leading Stein to argue that Kallmann’s sample “in no way constituted a reasonable cross-section of the homosexual population.”<sup>32</sup>

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(Samples such as Kallmann's are known as convenience samples, which involve selecting subjects from populations that are conveniently accessible to the researcher.)

Nevertheless, well-designed twin studies examining the genetics of homosexuality indicate that genetic factors likely play some role in determining sexual orientation. For example, in 2000, psychologist J. Michael Bailey and colleagues conducted a major study of sexual orientation using twins in the Australian National Health and Medical Research Council Twin Registry, a large probability sample, which was therefore more likely to be representative of the general population than Kallmann's.<sup>33</sup> The study employed the Kinsey scale to operationalize sexual orientation and estimated concordance rates for being homosexual of 20% for men and 24% for women in identical (maternal, monozygotic) twins, compared to 0% for men and 10% for women in non-identical (fraternal, dizygotic) twins.<sup>34</sup> The difference in the estimated concordance rates was statistically significant for men but not for women. On the basis of these findings, the researchers estimated that the heritability of homosexuality for men was 0.45 with a wide 95% confidence interval of 0.00–0.71; for women, it was 0.08 with a similarly wide confidence interval of 0.00–0.67. These estimates suggest that for males 45% of the differences between certain sexual orientations (homosexual versus heterosexuals as measured by the Kinsey scale) could be attributed to differences in genes.

The large confidence intervals in the study by Bailey and colleagues mean that we must be careful in assessing the substantive significance of these findings. The authors interpret their findings to suggest that “any major gene for strictly defined homosexuality has either low penetrance or low frequency,”<sup>35</sup> but their data did show (marginal) statistical significance. While the concordance estimates seem somewhat high in the models used, the confidence intervals are so wide that it is difficult to judge the reliability, including the replicability, of these estimates.

It is worth clarifying here what “heritability” means in these studies, since the technical meaning in population genetics is narrower and more precise than the everyday meaning of the word. Heritability is a measure of how much variation in a particular trait within a population can be attributed to variation in genes in that population. It is not, however, a measure of how much a trait is genetically determined.

Traits that are almost entirely genetically determined can have very low heritability values, while traits that have almost no genetic basis can be found to be highly heritable. For instance, the number of fingers human beings have is almost completely genetically determined. But there is little

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*variation* in the number of fingers humans have, and most of the variation we do see is due to non-genetic factors such as accidents, which would lead to low heritability estimates for the trait. Conversely, cultural traits can sometimes be found to be highly heritable. For instance, whether a given individual in mid-twentieth century America wore earrings would have been found to be highly heritable, because it was highly associated with being male or female, which is in turn associated with possessing XX or XY sex chromosomes, making variability in earring-wearing behavior highly associated with genetic differences, despite the fact that wearing earrings is a cultural rather than biological phenomenon. Today, heritability estimates for earring-wearing behavior would be lower than they were in mid-twentieth century America, not because of any changes in the American gene pool, but because of the increased acceptance of men wearing earrings.<sup>36</sup>

So, a heritability estimate of 0.45 does not mean that 45% of sexuality is determined by genes. Rather, it means that 45% of the variation between individuals in the population studied can be attributed in some way to genetic factors, as opposed to environmental factors.

In 2010, psychiatric epidemiologist Niklas Långström and colleagues conducted a large, sophisticated twin study of sexual orientation, analyzing data from 3,826 identical and fraternal same-sex twin pairs (2,320 identical and 1,506 fraternal pairs).<sup>37</sup> The researchers operationalized homosexuality in terms of lifetime same-sex sexual partners. The sample's concordance rates were somewhat lower than those found in the study by Bailey and colleagues. For having had at least one same-sex partner, the concordance for men was 18% in identical twins and 11% in fraternal twins; for women, 22% and 17%, respectively. For total number of sexual partners, concordance rates for men were 5% in identical twins and 0% in fraternal twins; for women, 11% and 7%, respectively.

For men, these rates suggest an estimated heritability rate of 0.39 for having had at least one lifetime same-sex partner (with a 95% confidence interval of 0.00–0.59), and 0.34 for total number of same-sex partners (with a 95% confidence interval of 0.00–0.53). Environmental factors experienced by one twin but not the other explained 61% and 66% of the variance, respectively, while environmental factors shared by the twins failed to explain any of the variance. For women, the heritability rate for having had at least one lifetime same-sex partner was 0.19 (95% confidence interval of 0.00–0.49); for total number of same-sex partners, it was 0.18 (95% confidence interval of 0.11–0.45). Unique environmental factors accounted for 64% and 66% of the variance, respectively, while

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shared environmental factors accounted for 17% and 16%, respectively. These values indicate that, while the genetic component of homosexual behavior is far from negligible, non-shared environmental factors play a critical, perhaps preponderant, role. The authors conclude that sexual orientation arises from both heritable and environmental influences unique to the individual, stating that “the present results support the notion that the individual-specific environment does indeed influence sexual preference.”<sup>38</sup>

Another large and nationally representative study of twins published by sociologists Peter S. Bearman and Hannah Brückner in 2002 used data from the National Longitudinal Study of Adolescent to Adult Health (commonly abbreviated as “Add Health”) of adolescents in grades 7–12.<sup>39</sup> They attempted to estimate the relative influence of social factors, genetic factors, and prenatal hormonal factors on the development of same-sex attractions. Overall, 8.7% of the 18,841 adolescents in their study reported same-sex attractions, 3.1% reported a same-sex romantic relationship, and 1.5% reported same-sex sexual behavior. The authors first analyzed the “social influence hypothesis,” according to which opposite-sex twins receive less gendered socialization from their families than same-sex twins or opposite-sex siblings, and found that this hypothesis was well-supported in the case of males. While female opposite-sex twins in the study were the least likely of all the groups to report same-sex attractions (5.3%), male opposite-sex twins were the likeliest to report same-sex attractions (16.8%)—more than twice as likely as males with a full, non-twin sister (16.8% vs. 7.3%). The authors concluded there was “substantial indirect evidence in support of a socialization model at the individual level.”<sup>40</sup>

The authors also examined the “intrauterine hormone transfer hypothesis,” according to which prenatal hormone transfers between opposite-sex twin fetuses influences the sexual orientation of the twins. (Note that this is different from the more general hypothesis that prenatal hormones influence the development of sexual orientation.) In the study, the proportion of male opposite-sex twins reporting same-sex attraction was about twice as high for those without older brothers (18.7%) as for those with older brothers (8.8%). The authors argued that this finding was strong evidence against the hormone-transfer hypothesis, since the presence of older brothers should not decrease the likelihood of same-sex attraction if that attraction has a basis in prenatal hormonal transfers. However, that conclusion seems premature: the observations are consistent with the possibility of *both* hormonal factors *and* the presence of an older brother having an effect (especially if the latter influences the former). This study

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also found no correlation between experiencing same-sex attraction and having multiple older brothers, which had been reported in some earlier studies.<sup>41</sup>

Finally, Bearman and Brückner did not find evidence of significant genetic influence on sexual attraction. Significant influence would require that identical twins have significantly higher concordance rates for same-sex attraction than fraternal twins or non-twin siblings. But in the study, the rates were statistically similar: identical twins were 6.7% concordant, dizygotic pairs 7.2% concordant, and full siblings 5.5% concordant. The authors concluded that “it is more likely that any genetic influence, if present, can only be expressed in specific and circumscribed social structures.”<sup>42</sup> Based on their data, they suggested the one observed social structure that might enable this genetic expression is the more limited “gender socialization associated with firstborn OS [opposite-sex] twin pairs.”<sup>43</sup> Thus, they inferred that their results “support the hypothesis that less gendered socialization in early childhood and preadolescence shapes subsequent same-sex romantic preferences.”<sup>44</sup> While the findings here are suggestive, further research is needed to confirm this hypothesis. The authors also argued that the higher concordance rates for same-sex attraction reported in previous studies may be unreliable due to methodological problems such as non-representative samples and small sample sizes. (It should be noted, however, that these remarks were published prior to the study by Långström and colleagues discussed above, which uses a study design that does not appear to have these limitations.)

To reconcile the somewhat mixed data on heritability, we could hypothesize that attraction to the same sex may have a stronger heritable component as people age—that is, when researchers attempt to measure sexual orientation later in life (as in the 2010 study by Långström and colleagues) than when measured earlier in life. Heritability estimates can change depending on the age at which a trait is measured because changes in the environmental factors that might influence variation in the trait may vary for individuals at different ages, and because genetically influenced traits may become more fixed at a later stage in an individual’s development (height, for instance, becomes fixed in early adulthood). This hypothesis is also suggested by findings, discussed below, that same-sex attraction may be more fluid in adolescence than in later stages of adulthood.

In contrast to the studies just summarized, psychiatrist Kenneth S. Kendler and colleagues conducted a large twin study using a probability sample of 794 twin pairs and 1,380 non-twin siblings.<sup>45</sup> Based on concordance rates for sexual orientation (defined in this study as self-iden-

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tification based on attraction), the authors state that their results “suggest that genetic factors may provide an important influence on sexual orientation.”<sup>46</sup> The study does not, however, appear to be sufficiently powerful to draw strong conclusions about the degree of genetic influence on sexuality: only 19 of 324 identical twin pairs had any non-heterosexual member, with 6 of the 19 pairs concordant; 15 of 240 same-sex fraternal twin pairs had any non-heterosexual member, with 2 of the 15 pairs concordant. Because only 8 twin pairs were concordant for non-heterosexuality, the study’s ability to draw substantively significant comparisons between identical and fraternal twins (or between twins and non-twin siblings) is limited.

Overall, these studies suggest that (depending on how homosexuality is defined) in anywhere from 6% to 32% of cases, both members of an identical twin pair would be homosexual if at least one member is. Since some twin studies found higher concordance rates in identical twins than in fraternal twins or non-twin siblings, there may be genetic influences on sexual desire and behavioral preferences. One needs to bear in mind that identical twins typically have even more similar environments—early attachment experiences, peer relationships, and the like—than fraternal twins or non-twin siblings. Because of their similar appearances and temperaments, for example, identical twins may be more likely than fraternal twins or other siblings to be treated similarly. So some of the higher concordance rates may be attributable to environmental factors rather than genetic factors. In any case, if genes do play a role in predisposing people toward certain sexual desires or behaviors, these studies make clear that genetic influences cannot be the whole story.

Summarizing the studies of twins, we can say that there is no reliable scientific evidence that sexual orientation is determined by a person’s genes. But there is evidence that genes play a role in influencing sexual orientation. So the question “Are gay people born that way?” requires clarification. There is virtually no evidence that anyone, gay or straight, is “born that way” if that means their sexual orientation was genetically determined. But there is some evidence from the twin studies that certain genetic profiles probably increase the likelihood the person later identifies as gay or engages in same-sex sexual behavior.

Future twin studies on the heritability of sexual orientation should include analyses of larger samples or meta-analyses or other systematic reviews to overcome the limited sample size and statistical power of some of the existing studies, and analyses of heritability rates across different dimensions of sexuality (such as attraction, behavior, and identity) to

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overcome the imprecisions of the ambiguous concept of sexual orientation and the limits of studies that look at only one of these dimensions of sexuality.

### **Molecular Genetics**

In examining the question whether, and perhaps to what extent, there may be genetic contributions to homosexuality, we have so far looked at studies that employ methods of classical genetics to estimate the heritability of a trait like sexual orientation but that do not identify particular genes that may be associated with the trait.<sup>47</sup> But genetics can also be studied using what are often called molecular methods that provide estimates of which particular genetic variations are associated with traits, whether physical or behavioral.

One early attempt to identify a more specific genetic basis for homosexuality was a 1993 study by geneticist Dean Hamer and colleagues of 40 pairs of homosexual brothers.<sup>48</sup> By examining the family history of homosexuality for these individuals, they identified a possible linkage between homosexuality in males and genetic markers on the Xq28 region of the X chromosome. Attempts to replicate this influential study's results have had mixed results: George Rice and colleagues attempted and failed to replicate Hamer's findings,<sup>49</sup> though in 2015 Alan R. Sanders and colleagues were able to replicate Hamer's original findings using a larger population size of 409 male twin pairs of homosexual brothers, and to find additional genetic linkage sites.<sup>50</sup> (Since the effect was small, however, the genetic marker would not be a good predictor of sexual orientation.)

Genetic linkage studies like the ones discussed above are able to identify particular regions of chromosomes that may be associated with a trait by looking at patterns of inheritance. Today, one of the chief methods for inferring which genetic variants are associated with a trait is the genome-wide association study, which uses DNA sequencing technologies to identify particular differences in DNA that may be associated with a trait. Scientists examine millions of genetic variants in large numbers of individuals who have a particular trait, as well as individuals who do not have the trait, and compare the frequency of genetic variants among those who do and do not have the trait. Specific genetic variants that occur more frequently among those who have than those who do not have the trait are inferred to have some association with that trait. Genome-wide association studies have become popular in recent years, yet few such scientific studies have found significant associations of genetic variants with sexual

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orientation. The largest attempt to identify genetic variants associated with homosexuality, a study of over 23,000 individuals from the 23andMe database presented at the American Society of Human Genetics annual meeting in 2012, found no linkages reaching genome-wide significance for same-sex sexual identity for males or females.<sup>51</sup>

So, again, the evidence for a genetic basis for homosexuality is inconsistent and inconclusive, which suggests that, though genetic factors explain some of the variation in sexual orientation, the genetic contribution to this trait is not likely to be strong and even less likely to be decisive.

As is often true of human behavioral tendencies, there may be genetic contributions to the tendency toward homosexual inclinations or behaviors. Phenotypic expression of genes is usually influenced by environmental factors—different environments may lead to different phenotypes even for the same genes. So even if there are genetic factors that contribute to homosexuality, an individual's sexual attractions or preferences may also be influenced by a number of environmental factors, such as social stressors, including emotional, physical, or sexual abuse. Looking to developmental, environmental, experiential, social, or volitional factors will be necessary to arrive at a fuller picture of how sexual interests, attractions, and desires develop.

### **The Limited Role of Genetics**

Lay readers might note at this point that even at the purely biological level of genetics, the shopworn “nature vs. nurture” debates regarding human psychology have been abandoned by scientists, who recognize that no credible hypothesis can be offered for any particular traits that would be determined either purely by genetics or the environment. The growing field of epigenetics, for example, demonstrates that even for relatively simple traits, gene expression itself can be influenced by innumerable other external factors that can shape the functioning of genes.<sup>52</sup> This is even more relevant when it comes to the relationship between genes and complex traits like sexual attraction, drives, and behaviors.

These gene-environment relationships are complex and multidimensional. Non-genetic developmental factors and environmental experiences may be sculpted, in part, by genetic factors working in subtle ways. For example, social geneticists have documented the indirect role of genes in peer-aligned behaviors, such that an individual's physical appearance could influence whether a particular social group will include or exclude that individual.<sup>53</sup>

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Contemporary geneticists know that genes can influence a person's range of interests and motivations, therefore indirectly affecting behavior. While genes may in this way incline a person to certain behaviors, compelling behavior directly, independently of a wide range of other factors, seems less plausible. They may influence behavior in more subtle ways, depending on external environmental stimuli (for instance, peer pressure, suggestion, and behavioral rewards) in conjunction with psychological factors and physical makeup. Dean Hamer, whose work on the possible role of genetics in homosexuality was examined above, explained some of the limitations of behavioral genetics in a 2002 article in *Science*: "The real culprit [of lack of progress in behavioral genetics] is the assumption that the rich complexity of human thought and emotion can be reduced to a simple, linear relation between individual genes and behaviors.... This oversimplified model, which underlies most current research in behavior genetics, ignores the critical importance of the brain, the environment, and gene expression networks."<sup>54</sup>

The genetic influences affecting any complex human behavior—whether sexual behaviors, or interpersonal interactions—depend in part on individuals' life experiences as they mature. Genes constitute only one of the many key influences on behavior in addition to environmental influences, personal choices, and interpersonal experiences. The weight of evidence to date strongly suggests that the contribution of genetic factors is modest. We can say with confidence that genes are not the sole, essential cause of sexual orientation; there is evidence that genes play a modest role in contributing to the development of sexual attractions and behaviors but little evidence to support a simplistic "born that way" narrative concerning the nature of sexual orientation.

### **The Influence of Hormones**

Another area of research relevant to the hypothesis that people are born with dispositions toward different sexual orientations involves prenatal hormonal influences on physical development and subsequent male- or female-typical behaviors in early childhood. For ethical and practical reasons, the experimental work in this field is carried out in non-human mammals, which limits how this research can be generalized to human cases. However, children who are born with disorders of sexual development (DSD) serve as a population in which to examine the influence of genetic and hormonal abnormalities on the subsequent development of non-typical sexual identity and sexual orientation.

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Hormones responsible for sexual differentiation are generally thought to exert on the developing fetus either *organizational* effects—which produce permanent changes in the wiring and sensitivity of the brain, and thus are considered largely irreversible—or *activating* effects, which occur later in an individual’s life (at puberty, and into adulthood).<sup>55</sup> Organizational hormones may prime the fetal systems (including the brain) structurally, and set the stage for sensitivity to hormones presenting at puberty and beyond, when the hormone will then “activate” systems which were “organized” prenatally.

Periods of peak response to the hormonal environment are thought to occur during gestation. For example, testosterone is thought to influence the male fetus maximally between weeks 8 and 24, and then again at birth, until about three months of age.<sup>56</sup> Estrogens are provided throughout gestation by the placenta and the mother’s blood system.<sup>57</sup> Studies in animals reveal there may even be multiple periods of sensitivity for a variety of hormones, that the presence of one hormone may influence the action of another hormone, and the sensitivity of the receptors for these hormones can influence their actions.<sup>58</sup> Sexual differentiation, alone, is a highly complex system.

Specific hormones of interest in this area of research are testosterone, dihydrotestosterone (a metabolite of testosterone, and more potent than testosterone), estradiol, progesterone, and cortisol. The generally accepted pathways of normal hormonal influence of development in utero are as follows. The typical pattern of sex differentiation in human fetuses begins with the differentiation of the sex organs into testes or ovaries, a process that is largely genetically controlled. Once these organs have differentiated, they produce specific hormones that determine development of external genitalia. This window of time in gestation is when hormones exert their phenotypic and neurological effects. Testosterone secreted by the testes contributes to the development of male external genitalia and affects neurological development in males;<sup>59</sup> it is the absence of testosterone in females which allows for the female pattern of external genitalia to develop.<sup>60</sup> Imbalances of testosterone or estrogen, as well as their presence or absence at specific critical periods of gestation, may cause disorders of sexual development. (Genetic or environmental effects can also lead to disorders of sexual development.)

Stress may also play some role in influencing the way hormones shape gonadal development, neurodevelopment, and subsequent sex-typical behaviors in early childhood.<sup>61</sup> Cortisol is the main hormone associated

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with stress responses. It may originate from the mother, if she experiences severe stressors during her pregnancy, or from the fetus under stress.<sup>62</sup> Elevated levels of cortisol may also occur from genetic defects.<sup>63</sup> One of the most extensively studied disorders of sexual development is congenital adrenal hyperplasia (CAH), which in females can result in genital virilization.<sup>64</sup> Over 90% of cases of CAH result from a mutation in a gene that codes for an enzyme that helps synthesize cortisol.<sup>65</sup> This results in an overproduction of cortisol precursors, some of which are converted into androgens (hormones associated with male sex development).<sup>66</sup> As a result, girls are born with some degree of virilization of their genitalia, depending on the severity of the genetic defect.<sup>67</sup> For severe cases of genital virilization, surgical intervention is sometimes performed to normalize the genitalia. Hormone therapies are also often administered to mitigate the effects of excess androgen production.<sup>68</sup> Females with CAH, who as fetuses were exposed to above-average levels of androgens, are less likely to be exclusively heterosexual than females without CAH, and females with more severe forms of CAH are more likely to be non-heterosexual than females with milder forms of the condition.<sup>69</sup>

Likewise, there are disorders of sexual development in genetic males affected by androgen insensitivity. In males with androgen insensitivity syndrome, the testes produce testosterone normally, but the receptors to testosterone are not functional.<sup>70</sup> The genitalia, at birth, appear to be female, and the child is usually raised as a female. The individual's endogenous testosterone is broken down into estrogen, such that the individual begins to develop female secondary sex characteristics.<sup>71</sup> It does not become apparent that there is a problem until puberty, when the individual does not start menses appropriately.<sup>72</sup> These patients generally prefer to continue life as females, and their sexual orientation does not differ from females having an XX genotype.<sup>73</sup> Studies have suggested that they are just as likely if not more likely to be exclusively interested in male partners than XX females.<sup>74</sup>

There are other disorders of sexual development affecting some genetic males (i.e., with an XY genotype) in whom androgen deficiencies are a direct result of the lack of enzymes either to synthesize dihydrotestosterone from testosterone or to produce testosterone from its precursor hormone.<sup>75</sup> Individuals with these deficiencies are born with varied degrees of ambiguous genitalia, and are sometimes raised as girls. During puberty, however, these individuals often experience physical virilization, and must then decide whether to live as men or women. Peggy T. Cohen-Kettenis, a professor of gender development and psychopathology, found that 39 to

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64% of individuals with these deficiencies who are raised as girls change to live as men in adolescence and early adulthood, and she also reported that “the degree of external genital masculinization at birth does not seem to be related to gender role changes in a systematic way.”<sup>76</sup>

The twin studies reviewed earlier may shed light on the role of maternal hormonal influences, since both identical and fraternal twins are exposed to similar maternal hormonal influences in utero. The relatively weak concordance rates in the twin studies suggest that prenatal hormones, like genetic factors, do not play a strongly determinative role in sexual orientation. Other attempts at finding significant hormonal influences on sexual development have likewise been mixed, and the salience of the findings is not yet clear. Since direct studies of prenatal hormonal influences on sexual development are methodologically difficult, some studies have tried to develop models whereby differences in prenatal hormonal exposure can be inferred indirectly—by measuring subtle morphological changes or by examining hormonal disorders that are present later during development.

For example, one rough proxy of prenatal testosterone levels used by researchers is the ratio between the length of the second finger (index finger) and the fourth finger (ring finger), which is commonly called the “2D:4D ratio.” Some evidence suggests that the ratio may be influenced by prenatal exposure to testosterone, such that in males higher levels of exposure to testosterone cause shorter index fingers relative to the ring finger (or having a low 2D:4D ratio), and vice versa.<sup>77</sup> According to one hypothesis, homosexual men may have a higher 2D:4D ratio (closer to the ratio found in females than in heterosexual males), while another hypothesis suggests the opposite, that homosexual men may be hypermasculinized by prenatal testosterone, resulting in a lower ratio than in heterosexual men. For women, the hypothesis for homosexuality that they have been hypermasculinized (lower ratio, higher testosterone) has also been proposed. Several studies comparing this trait in homosexually versus heterosexually identified men and women have shown mixed results.

A study published in *Nature* in 2000 found that in a sample of 720 California adults, the right-hand 2D:4D ratio of homosexual women was significantly more masculine (that is, the ratio was smaller) than that of heterosexual women and did not differ significantly from that of heterosexual men.<sup>78</sup> This study also found no significant difference in mean 2D:4D ratio between heterosexual and homosexual men. Another study that year, which used a relatively small sample of homosexual and heterosexual men from the United Kingdom, reported a lower 2D:4D (that

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is, more masculine) ratio in homosexual men.<sup>79</sup> A 2003 study using a London-based sample also found that homosexual men had a lower 2D:4D ratio than heterosexuals,<sup>80</sup> while two other studies with samples from California and Texas showed *higher* 2D:4D ratios for homosexual men.<sup>81</sup>

A 2003 twin study compared seven female monozygotic twin pairs discordant for homosexuality (one twin was lesbian) and five female monozygotic twin pairs concordant for homosexuality (both twins were lesbian).<sup>82</sup> In the twin pairs discordant for sexual orientation, the individuals identifying as homosexual had significantly lower 2D:4D ratios than their twins, whereas the concordant twins showed no difference. The authors interpreted this result as suggesting that “low 2D:4D ratio is a result of differences in prenatal environment.”<sup>83</sup> Finally, a 2005 study of 2D:4D ratios in an Austrian sample of 95 homosexual and 79 heterosexual men found that the 2D:4D ratios of heterosexual men were not significantly different from those of homosexual men.<sup>84</sup> After reviewing the several studies on this trait, the authors conclude that “more data are essential before we can be sure whether there is a 2D:4D effect for sexual orientation in men when ethnic variation is controlled for.”<sup>85</sup>

Much research has examined the effects of prenatal hormones on behavior and brain structure. Again, these results come primarily from studies of non-human primates, but the study of disorders of sexual development has provided helpful insights into the effects of hormones on sexual development in humans. Since hormonal influences typically occur during time-sensitive periods of development, when their effects manifest physically, it is reasonable to assume that organizational effects of these early, time-linked hormonal patterns are likely to direct aspects of neural development. Neuroanatomical connectivity and neurochemical sensitivities may be among such influences.

In 1983, Günter Dörner and colleagues performed a study investigating whether there is any relationship between maternal stress during pregnancy and later sexual identity of their children, interviewing two hundred men about stressful events that may have occurred to their mothers during their prenatal lives.<sup>86</sup> Many of these events occurred as a consequence of World War II. Of men who reported that their mothers had experienced moderately to severely stressful events during pregnancy, 65% were homosexual, 25% were bisexual, and 10% were heterosexual. (Sexual orientation was assessed using the Kinsey scale.) However, more recent studies have shown much smaller or no significant correlations.<sup>87</sup> In a 2002 prospective study on the relationship between sexual orientation and prenatal stress during the second and third trimesters, Hines

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and colleagues found that stress reported by mothers during pregnancy showed “only a small relationship” to male-typical behaviors in their daughters at the age of 42 months, “and no relationship at all” to female-typical behaviors in their sons.<sup>88</sup>

In summary, some forms of prenatal hormone exposure, particularly CAH in females, are associated with differences in sexual orientation, while other factors are often important in determining the physical and psychological effects of those exposures. Hormonal conditions that contribute to disorders of sex development may contribute to the development of non-heterosexual orientations in some individuals, but this does not demonstrate that such factors explain the development of sexual attractions, desires, and behaviors in the majority of cases.

### **Sexual Orientation and the Brain**

There have been several studies examining neurobiological differences between individuals who identify as heterosexual and those who identify as homosexual. This work began with neuroscientist Simon LeVay’s 1991 study that reported biological differences in the brains of gay men as compared to straight men—specifically, a difference in volume in a particular cell group of the interstitial nuclei of the anterior hypothalamus (INAH3).<sup>89</sup> Later work by psychiatrist William Byne and colleagues showed more nuanced findings: “In agreement with two prior studies... we found INAH3 to be sexually dimorphic, occupying a significantly greater volume in males than females. In addition, we determined that the sex difference in volume was attributable to a sex difference in neuronal number and not in neuronal size or density.”<sup>90</sup> The authors noted that, “Although there was a trend for INAH3 to occupy a smaller volume in homosexual men than in heterosexual men, there was no difference in the number of neurons within the nucleus based on sexual orientation.” They speculated that “postnatal experience” may account for the differences in volume in this region between homosexual and heterosexual men, though this would require further research to confirm.<sup>91</sup> They also noted that the functional significance of sexual dimorphism in INAH3 is unknown. The authors conclude: “Based on the results of the present study as well as those of LeVay (1991), sexual orientation cannot be reliably predicted on the basis of INAH3 volume alone.”<sup>92</sup> In 2002, psychologist Mitchell S. Lasco and colleagues published a study examining a different part of the brain—the anterior commissure—and found that there were no significant differences in that area based either on sex or sexual orientation.<sup>93</sup>

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Other studies have since been conducted to ascertain structural or functional differences between the brains of heterosexual and homosexual individuals (using a variety of criteria to define these categories). Findings from several of these studies are summarized in a 2008 commentary published in the *Proceedings of the National Academy of Sciences*.<sup>94</sup> Research of this kind, however, does not seem to reveal much of relevance regarding the etiology or biological origins of sexual orientation. Due to inherent limitations, this research literature is fairly unremarkable. For example, in one study functional MRI was used to measure activity changes in the brain when pictures of men and women were shown to subjects, finding that viewing a female face produced stronger activity in the thalamus and orbitofrontal cortex of heterosexual men and homosexual women, whereas in homosexual men and heterosexual women these structures reacted more strongly to the face of a man.<sup>95</sup> That the brains of heterosexual women and homosexual men reacted distinctively to the faces of men, whereas the brains of heterosexual men and homosexual women reacted distinctively to the faces of women, is a finding that seems rather trivial with respect to understanding the etiology of homosexual attractions. In a similar vein, one study reported different responses to pheromones between homosexual and heterosexual men,<sup>96</sup> and a follow-up study showed a similar finding in homosexual compared to heterosexual women.<sup>97</sup> Another study showed differences in cerebral asymmetry and functional connectivity between homosexual and heterosexual subjects.<sup>98</sup>

While findings of this kind may suggest avenues for future investigation, they do not move us much closer to an understanding of the biological or environmental determinants of sexual attractions, interests, preferences, or behaviors. We will say more about this below. For now, we will briefly illustrate a few of the inherent limitations in this area of research with the following hypothetical example. Suppose we were to study the brains of yoga teachers and compare them to the brains of bodybuilders. If we search long enough, we will eventually find statistically significant differences in some area of brain morphology or brain function between these two groups. But this would not imply that such differences determined the different life trajectories of the yoga teacher and the bodybuilder. The brain differences could have been the result, rather than the cause, of distinctive patterns of behavior or interests.<sup>99</sup> Consider another example. Suppose that gay men tend to have less body fat than straight men (as indicated by lower average scores on body mass indices). Even though body mass is, in part, determined by genetics, we could not claim based on this finding that there is some innate, genetic cause of both body

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mass and homosexuality at work. It could be the case, for instance, that being gay is associated with a diet that lowers body mass. These examples illustrate one of the common problems encountered in the popular interpretation of such research: the suggestion that the neurobiological pattern determines a particular behavioral expression.

With this overview of studies on biological factors that might influence sexual attraction, preferences, or desires, we can understand the rather strong conclusion by social psychologist Letitia Anne Peplau and colleagues in a 1999 review article: “To recap, more than 50 years of research has failed to demonstrate that biological factors are a major influence in the development of women’s sexual orientation.... Contrary to popular belief, scientists have not convincingly demonstrated that biology determines women’s sexual orientation.”<sup>100</sup> In light of the studies we have summarized here, this statement could also be made for research on male sexual orientation, however this concept is defined.

### Misreading the Research

There are some significant built-in limitations to what the kind of empirical research summarized in the preceding sections can show. Ignoring these limitations is one of the main reasons the research is routinely misinterpreted in the public sphere. It may be tempting to assume, as we just saw with the example of brain structure, that if a particular biological profile is associated with some behavioral or psychological trait, then that biological profile *causes* that trait. This reasoning relies on a fallacy, and in this section we explain why, using concepts from the field of epidemiology. While some of these issues are rather technical in detail, we will try to explain them in a general way that is accessible to the non-specialist reader.

Suppose for the sake of illustration that one or more differences in a biological trait are found between homosexual and heterosexual men. That difference could be a discrete measure (call this D) such as presence of a genetic marker, or it could be a continuous measure (call this C) such as the average volume of a particular part of the brain.

Showing that a risk factor significantly increases the chances of a particular health outcome or a behavior might give us a clue to development of that health outcome or that behavior, but it does not provide evidence of causation. Indeed, it may not provide evidence of anything but the weakest of correlations. The inference is sometimes made that if it can be shown that gay men and straight men differ significantly in the

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probability that D is present (whether a gene, a hormonal factor, or something else), no matter how low that probability, then this finding suggests that being gay has a biological basis. But this inference is unwarranted. Doubling (or even tripling or quadrupling) the probability of a relatively rare trait can have little value in terms of predicting who will or will not identify as gay.

The same would be true for any continuous variable (C). Showing a significant difference at the mean or average for a given trait (such as the volume of a particular brain region) between men who identify as heterosexual and men who identify as homosexual does not suffice to show that this average difference contributes to the probability of identifying as heterosexual or homosexual. In addition to the reasons explained above, a significant difference at the means of two distributions can be consistent with a great deal of overlap between the distributions. That is, there may be virtually no separation in terms of distinguishing between some individual members of each group, and thus the measure would not provide much predictability for sexual orientation or preference.

Some of these issues could, in part, be addressed by additional methodological approaches, such as the use of a training sample or cross-validation procedures. A training sample is a small sample used to develop a model (or hypothesis); this model is then tested on a larger independent sample. This method avoids testing a hypothesis on the same data used to develop the hypothesis. Cross-validation includes procedures used to examine whether a statistically significant effect is really there or just due to chance. If one wants to show the result did not occur by chance (and if the sample is large), one can run the same tests on a random split of the relevant sample. After finding a difference in the prevalence of trait D or C between a gay sample and a straight sample, researchers could randomly split the gay sample into two groups and then show that these two groups do not differ regarding D or C. Suppose one finds five differences out of 100 comparing gay to straight men in the overall samples, then finds five differences out of 100 when comparing the split gay samples. This would cast additional doubt on the initial finding of a difference between the means of gay and straight individuals.

### **Sexual Abuse Victimization**

Whereas the preceding discussion considered the part that biological factors might play in the development of sexual orientation, this section will summarize evidence that a particular environmental factor—childhood

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sexual abuse—is reported significantly more often among those who later identify as homosexual. The results presented below raise the question whether there is an association between sexual abuse, particularly in childhood, and later expressions of sexual attraction, behavior, or identity. If so, might child abuse increase the probability of having a non-heterosexual orientation?

Correlations, at least, have been found, as we will summarize below. But we should note first that they might be accounted for by one or more of the following conjectures:

1. Abuse might contribute to the development of non-heterosexual orientation.
2. Children with (signs of future) non-heterosexual tendencies might attract abusers, placing them at elevated risk.
3. Certain factors might contribute to *both* childhood sexual abuse and non-heterosexual tendencies (for instance, a dysfunctional family or an alcoholic parent).

It should be kept in mind that these three hypotheses are not mutually exclusive; all three, and perhaps others, might be operative. As we summarize the studies on this issue, we will try to evaluate each of these hypotheses in light of current scientific research.

Behavioral and community health professor Mark S. Friedman and colleagues conducted a 2011 meta-analysis of 37 studies from the United States and Canada examining sexual abuse, physical abuse, and peer victimization in heterosexuals as compared to non-heterosexuals.<sup>101</sup> Their results showed that non-heterosexuals were on average 2.9 times more likely to report having been abused as children (under 18 years of age). In particular, non-heterosexual males were 4.9 times likelier—and non-heterosexual females, 1.5 times likelier—than their heterosexual counterparts to report sexual abuse. Non-heterosexual adolescents as a whole were 1.3 times likelier to indicate physical abuse by parents than their heterosexual peers, but gay and lesbian adolescents were only 0.9 times as likely (bisexuals were 1.4 times as likely). As for peer victimization, non-heterosexuals were 1.7 times likelier to report being injured or threatened with a weapon or being attacked.

The authors note that although they hypothesized that the rates of abuse would decrease as social acceptance of homosexuality rose, “disparities in prevalence rates of sexual abuse, parental physical abuse, and peer

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victimization between sexual minority and sexual nonminority youths did not change from the 1990s to the first decade of the 2000s.”<sup>102</sup> While these authors cite authorities who claim that sexual abuse does not “cause individuals to become gay, lesbian, or bisexual,”<sup>103</sup> their data do not give evidence against the hypothesis that childhood sexual abuse might affect sexual orientation. On the other hand, the causal path could be in the opposite direction or bi-directional. The evidence does not refute or support this conjecture; the study’s design is not capable of shedding much light on the question of directionality.

The authors invoke a widely-cited hypothesis to explain the higher rates of sexual abuse among non-heterosexuals, the hypothesis that “sexual minority individuals are...more likely to be targeted for sexual abuse, as youths who are perceived to be gay, lesbian, or bisexual are more likely to be bullied by their peers.”<sup>104</sup> The two conjectures—that abuse is a cause and that it is a result of non-heterosexual tendencies—are not mutually exclusive: abuse may be a causal factor in the development of non-heterosexual attractions and desires, and at the same time non-heterosexual attractions, desires, and behaviors may increase the risk of being targeted for abuse.

Community health sciences professor Emily Faith Rothman and colleagues conducted a 2011 systematic review of the research investigating the prevalence of sexual assault against people who identify as gay, lesbian, or bisexual in the United States.<sup>105</sup> They examined 75 studies (25 of which used probability sampling) involving a total of 139,635 gay or bisexual (GB) men and lesbian or bisexual (LB) women, which measured the prevalence of victimization due to lifetime sexual assault (LSA), childhood sexual assault (CSA), adult sexual assault (ASA), intimate partner sexual assault (IPSA), and hate-crime-related sexual assault (HC). Although the study was limited by not having a heterosexual control group, it showed alarmingly high rates of sexual assault, including childhood sexual assault, for this population, as summarized in Table 1.

Using a multi-state probability-based sample in a 2013 study, psychologist Judith Anderson and colleagues compared differences in adverse childhood experiences—including dysfunctional households; physical, sexual, or emotional abuse; and parental discord—among self-identified homosexual, heterosexual, and bisexual adults.<sup>106</sup> They found that bisexuals had significantly higher proportions than heterosexuals of all adverse childhood experience factors, and that gays and lesbians had significantly higher proportions than heterosexuals of all these measures except parental separation or divorce. Overall, gays and lesbians had nearly 1.7 times,

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**Table 1. Sexual Assault among Gay/Bisexual Men and Lesbian/Bisexual Women**

GB Men (%)	LB Women (%)
CSA: 4.1–59.2 (median 22.7)	CSA: 14.9–76.0 (median 34.5)
ASA: 10.8–44.7 (median 14.7)	ASA: 11.3–53.2 (median 23.2)
LSA: 11.8–54.0 (median 30.4)	LSA: 15.6–85.0 (median 43.4)
IPSA: 9.5–57.0 (median 12.1)	IPSA: 3.0–45.0 (median 13.3)
HC: 3.0–19.8 (median 14.0)	HC: 1.0–12.3 (median 5.0)

and bisexuals 1.6 times, the heterosexual rate of adverse childhood experiences. The data for abuse are summarized in Table 2.

While this study, like some others we have discussed, may be limited by recall bias—that is, inaccuracies introduced by errors of memory—it has the merit of having a control group of self-identified heterosexuals to compare with self-identified gay/lesbian and bisexual cohorts. In their discussion of findings, the authors critique the hypothesis that childhood trauma has a causal relationship to homosexual preferences. Among their reasons for skepticism, they note that the vast majority of individuals who suffer childhood trauma do not become gay or bisexual, and that gender-nonconforming behavior may help explain the elevated rates of abuse. However, it is plausible from these and related results to hypothesize

**Table 2. Adverse Childhood Experiences among Gays/Lesbians, Bisexuals, and Heterosexuals****Sexual Abuse (%)**

GLs	Bisexuals	Heterosexuals
29.7	34.9	14.8

**Emotional Abuse (%)**

GLs	Bisexuals	Heterosexuals
47.9	48.4	29.6

**Physical Abuse (%)**

GLs	Bisexuals	Heterosexuals
29.3	30.3	16.7

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that adverse childhood experiences may be a significant—but not a determinative—factor in developing homosexual preferences. Further studies are needed to see whether either or both hypotheses have merit.

A 2010 study by professor of social and behavioral sciences Andrea Roberts and colleagues examined sexual orientation and risk of post-traumatic stress disorder (PTSD) using data from a national epidemiological face-to-face survey of nearly 35,000 adults.<sup>107</sup> Individuals were placed into several categories: heterosexual with no same-sex attraction or partners (reference group); heterosexual with same-sex attraction but no same-sex partners; heterosexual with same-sex partners; self-identified gay/lesbian; and self-identified bisexual. Among those reporting exposure to traumatic events, gay and lesbian individuals as well as bisexuals had about twice the lifetime risk of PTSD compared to the heterosexual reference group. Differences were found in rates of childhood maltreatment and interpersonal violence: gays, lesbians, bisexuals, and heterosexuals with same-sex partners reported experiencing worse traumas during childhood and adolescence than the reference group. The findings are summarized in Table 3.

Similar patterns emerged in a 2012 study by psychologist Brendan Zietsch and colleagues that primarily focused on the distinct question of whether common causal factors could explain the association between sexual orientation—in this study defined as sexual preference—and depression.<sup>108</sup> In a community sample of 9,884 adult twins, the authors found that non-heterosexuals had significantly elevated prevalence of lifetime depression (odds ratio for males 2.8; odds ratio for females 2.7). As the authors point out, the data raised questions about whether higher rates of depression for non-heterosexuals could be explained, in their entirety, by the social stress hypothesis (the idea, discussed in depth in Part Two of this report, that social stress

**Table 3. Childhood Exposure to Maltreatment or Interpersonal Violence (before Age 18)**

Women	Men
49.2% of lesbians	31.5% of gays
51.2% of bisexuals	Approximately 32% of bisexuals <sup>109</sup>
40.9% of heterosexuals with same-sex partners	27.9% of heterosexuals with same-sex partners
21.2% of heterosexuals	19.8% of heterosexuals



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experienced by sexual minorities accounts for their elevated risks of poor mental health outcomes). Heterosexuals with a non-heterosexual twin had higher rates of depression (39%) than heterosexual twin pairs (31%), suggesting that genetic, familial, or other factors may play a role.

The authors note that “in both males and females, significantly higher rates of non-heterosexuality were found in participants who experienced childhood sexual abuse and in those with a risky childhood family environment.”<sup>110</sup> Indeed, 41% of non-heterosexual males and 42% of non-heterosexual females reported childhood family dysfunction, compared to 24% and 30% of heterosexual males and females, respectively. And 12% of non-heterosexual males and 24% of non-heterosexual females reported sexual abuse before the age of 14, compared with 4% and 11% of heterosexual males and females, respectively. The authors are careful to emphasize that their findings should not be interpreted as disproving the social stress hypothesis, but suggest that there may be other factors at work. Their findings do, however, suggest there could be common etiological factors for depression and non-heterosexual preferences, as they found that genetic factors account for 60% of the correlation between sexual orientation and depression.<sup>111</sup>

In a 2001 study, psychologist Marie E. Tomeo and colleagues noted that the previous literature had consistently found increased rates of reported childhood molestation in the homosexual population, with somewhere between 10% and 46% reporting that they had experienced childhood sexual abuse.<sup>112</sup> The authors found that 46% of homosexual men and 22% of homosexual women reported that they had been molested by a person of the same gender, as compared with 7% of heterosexual men and 1% of heterosexual women. Moreover, 38% of homosexual women interviewed did not identify as homosexual until after the abuse, while the authors report conflicting figures—68% in one part of the paper and (by inference) 32% in another—for the number of homosexual men who did not identify as homosexual until after the abuse. The sample for this study was relatively small, only 267 individuals; also, the “sexual contact” measure of abuse in the survey was somewhat vague, and the subjects were recruited from participants in gay pride events in California. But the authors state that “it is most unlikely that all the present findings apply only to homosexual persons who go to homosexual fairs and volunteer to participate in questionnaire research.”<sup>113</sup>

In 2010, psychologists Helen Wilson and Cathy S. Widom published a prospective 30-year follow-up study—one that looked at children who had experienced abuse or neglect between 1961 and 1971, and then followed up with those children after 30 years—to ascertain whether physical abuse, sexual abuse, or neglect in childhood increased the likelihood of same-sex

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sexual relationships later in life.<sup>114</sup> An original sample of 908 abused and/or neglected children was matched with a non-maltreated control group of 667 individuals (matched for age, sex, race or ethnicity, and approximate socioeconomic status). Homosexuality was operationalized as anyone who had cohabited with a same-sex romantic partner or had a same-sex sexual partner, which made up 8% of the sample. Among these 8%, most individuals also reported having had opposite-sex partners, suggesting high rates of bisexuality or fluidity in sexual attractions or behaviors. The study found that those who reported histories of childhood sexual abuse were 2.8 times more likely to report having had same-sex sexual relationships, though the “relationship between childhood sexual abuse and same-sex sexual orientation was significant only for men.”<sup>115</sup> This finding suggested that boys who are sexually abused may be more likely to establish both heterosexual and homosexual relationships.

The authors advised caution in interpreting this result, because the sample size of sexually abused men was small, but the association remained statistically significant when they controlled for total lifetime number of sexual partners and for engaging in prostitution. The study was also limited by a definition of sexual orientation that was not sensitive to how participants identified themselves. It may have failed to capture people with same-sex attractions but no same-sex romantic relationship history. The study had two notable methodological strengths. The prospective design is better suited for evaluating causal relationships than the typical retrospective design. Also, the childhood abuse recorded was documented when it occurred, thus mitigating recall bias.

Having examined the statistical association between childhood sexual abuse and later homosexuality, we turn to the question of whether the association suggests causation.

A 2013 analysis by health researcher Andrea Roberts and colleagues attempted to provide an answer to this question.<sup>116</sup> The authors noted that while studies show 1.6 to 4 times more reported childhood sexual and physical abuse among gay and lesbian individuals than among heterosexuals, conventional statistical methods cannot demonstrate a strong enough statistical relationship to support the argument of causation. They argued that a sophisticated statistical method called “instrumental variables,” imported from econometrics and economic analysis, could increase the level of association.<sup>117</sup> (The method is somewhat similar to the method of “propensity scores,” which is more sophisticated and more familiar to public health researchers.) The authors applied the method of instrumental variables to data collected from a nationally representative sample.

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They used three dichotomous measures of sexual orientation: any vs. no same-sex attraction; any vs. no lifetime same-sex sexual partners; and lesbian, gay, or bisexual vs. heterosexual self-identification. As in other studies, the data showed associations between childhood sexual abuse or maltreatment and all three dimensions of non-heterosexuality (attraction, partners, identity), with associations between sexual abuse and sexual identity being the strongest.

The authors' instrumental variable models suggested that early sexual abuse increased the predicted rate of same-sex attraction by 2.0 percentage points, same-sex partnering by 1.4 percentage points, and same-sex identity by 0.7 percentage points. The authors estimated the rate of homosexuality that might be attributable to sexual abuse "using effect estimates from conventional models" and found that on conventional effect estimates, "9% of same-sex attraction, 21% of any lifetime same-sex sexual partnering, and 23% of homosexual or bisexual identity was due to childhood sexual abuse."<sup>118</sup> We should note that these correlations are cross-sectional: they compare groups of people to groups of people, rather than model the course of individuals over time. (A study design with a time-series analysis would give the strongest statistical support to the claim of causality.) Additionally, these results have been strongly criticized on methodological grounds for having made unjustified assumptions in the instrumental variables regression; a commentary by Drew H. Bailey and J. Michael Bailey claims, "Not only do Roberts et al.'s results fail to provide support for the idea that childhood maltreatment causes adult homosexuality, the pattern of differences between males and females is opposite what should be expected based on better evidence."<sup>119</sup>

Roberts and colleagues conclude their study with several conjectures to explain the epidemiological associations. They echo suggestions made elsewhere that sexual abuse perpetrated by men might cause boys to think they are gay or make girls averse to sexual contact with men. They also conjecture that sexual abuse might leave victims feeling stigmatized, which in turn might make them more likely to act in ways that are socially stigmatized (as by engaging in same-sex sexual relationships). The authors also point to the biological effects of maltreatment, citing studies that show that "quality of parenting" can affect chemical and hormonal receptors in children, and hypothesizing that this might influence sexuality "through epigenetic changes, particularly in the stria terminalis and the medial amygdala, brain regions that regulate social behavior."<sup>120</sup> They also mention the possibilities that emotional numbing caused by maltreatment may drive victims to seek out risky behaviors associated

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with same-sex sexuality, or that same-sex attractions and partnering may result from “the drive for intimacy and sex to repair depressed, stressed, or angry moods,” or from borderline personality disorder, which is a risk factor in individuals who have been maltreated.<sup>121</sup>

In short, while this study suggests that sexual abuse may sometimes be a causal contributor to having a non-heterosexual orientation, more research is needed to elucidate the biological or psychological mechanisms. Without such research, the idea that sexual abuse may be a causal factor in sexual orientation remains speculative.

### **Distribution of Sexual Desires and Changes Over Time**

However sexual desires and interests develop, there is a related issue that scientists debate: whether sexual desires and attractions tend to remain fixed and unalterable across the lifespan of a person—or are fluid and subject to change over time but tend to become fixed after a certain age or developmental period. Advocates of the “born that way” hypothesis, as mentioned earlier, sometimes argue that a person is not only born with a sexual orientation but that that orientation is immutable; it is fixed for life.

There is now considerable scientific evidence that sexual desires, attractions, behaviors, and even identities can, and sometimes do, change over time. For findings in this area we can turn to the most comprehensive study of sexuality to date, the 1992 National Health and Social Life Survey conducted by the National Opinion Research Center at the University of Chicago (NORC).<sup>122</sup> Two important publications have appeared using data from NORC’s comprehensive survey: *The Social Organization of Sexuality: Sexual Practices in the United States*, a large tome of data intended for the research community, and *Sex in America: A Definitive Survey*, a smaller and more accessible book summarizing the findings for the general public.<sup>123</sup> These books present data from a reliable probability sample of the American population between ages 18 and 59.

According to data from the NORC survey, the estimated prevalence of non-heterosexuality, depending on how it was operationalized, and on whether the subjects were male or female, ranged between roughly 1% and 9%.<sup>124</sup> The NORC studies added scientific respectability to sexual surveys, and these findings have been largely replicated in the United States and abroad. For example, the British National Survey of Sexual Attitudes and Lifestyles (Natsal) is probably the most reliable source of information on sexual behavior in that country—a study conducted every ten years since 1990.<sup>125</sup>

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The NORC study also suggested ways in which sexual behaviors and identities can vary significantly under different social and environmental circumstances. The findings revealed, for example, a sizable difference in rates of male homosexual behavior among individuals who spent their adolescence in rural as compared to large metropolitan cities in America, suggesting the influence of social and cultural environments. Whereas only 1.2% of males who had spent their adolescence in a rural environment responded that they had had a male sexual partner in the year of the survey, those who had spent adolescence living in metropolitan areas were close to four times (4.4%) more likely to report that they had had such an encounter.<sup>126</sup> From these data one cannot infer differences between these environments in the prevalence of sexual interests or attractions, but the data do suggest differences in sexual behaviors. Also of note is that women who attended college were nine times more likely to identify as lesbians than women who did not.<sup>127</sup>

Moreover, other population-based surveys suggest that sexual desire may be fluid for a considerable number of individuals, especially among adolescents as they mature through the early stages of adult development. In this regard, opposite-sex attraction and identity seem to be more stable than same-sex or bisexual attraction and identity. This is suggested by data from the National Longitudinal Study of Adolescent to Adult Health (the “Add Health” study discussed earlier). This prospective longitudinal study of a nationally representative sample of U.S. adolescents starting in grades 7–12 began during the 1994–1995 school year, and followed the cohort into young adulthood, with four follow-up interviews (referred to as Waves I, II, III, IV in the literature).<sup>128</sup> The most recent was in 2007–2008, when the sample was aged 24–32.

Same-sex or both-sex romantic attractions were quite prevalent in the study’s first wave, with rates of approximately 7% for the males and 5% for the females.<sup>129</sup> However, 80% of the adolescent males who had reported same-sex attractions at Wave I later identified themselves as exclusively heterosexual as young adults at Wave IV.<sup>130</sup> Similarly, for adolescent males who, at Wave I, reported romantic attraction to both sexes, over 80% of them reported no same-sex romantic attraction at Wave III.<sup>131</sup> The data for the females surveyed were similar but less striking: for adolescent females who had both-sex attractions at Wave I, more than half reported exclusive attraction to males at Wave III.<sup>132</sup>

J. Richard Udry, the director of Add Health for Waves I, II, and III,<sup>133</sup> was among the first to point out the fluidity and instability of romantic attraction between the first two waves. He reported that among boys who

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reported romantic attraction *only* to boys and *never* to girls at Wave I, 48% did so during Wave II; 35% reported no attraction to either sex; 11% reported exclusively same-sex attraction; and 6% reported attraction to both sexes.<sup>134</sup>

Ritch Savin-Williams and Geoffrey Ream published a 2007 analysis of the data from Waves I–III of Add Health.<sup>135</sup> Measures used included whether individuals ever had a romantic attraction for a given sex, sexual behavior, and sexual identity. (The categories for sexual identity were 100% heterosexual, mostly heterosexual but somewhat same-sex attracted, bisexual, mostly homosexual but somewhat attracted to opposite sex, and 100% homosexual.) While the authors noted the “stability of opposite-sex attraction and behavior” between Waves I and III, they found a “high proportion of participants with same- and both-sex attraction and behavior that migrated into opposite-sex categories between waves.”<sup>136</sup> A much smaller proportion of those in the heterosexual categories, and a similar proportion of those without attraction, moved to non-heterosexual categories. The authors summarize: “All attraction categories other than opposite-sex were associated with a lower likelihood of stability over time. That is, individuals reporting any same-sex attractions were more likely to report subsequent shifts in their attractions than were individuals without any same-sex attractions.”<sup>137</sup>

The authors also note the difficulties these data present for trying to define sexual orientation and to classify individuals according to such categories: “the critical consideration is whether having ‘any’ same-sex sexuality qualifies as nonheterosexuality. How much of a dimension must be present to tip the scales from one sexual orientation to another was not resolved with the present data, only that such decisions matter in terms of prevalence rates.”<sup>138</sup> The authors suggested that researchers could “forsake the general notion of sexual orientation altogether and assess only those components relevant for the research question.”<sup>139</sup>

Another prospective study by biostatistician Miles Ott and colleagues of 10,515 youth (3,980 males; 6,535 females) in 2013 showed findings on sexual orientation change in adolescents consistent with the findings of the Add Health data, again suggesting fluidity and plasticity of same-sex attractions among many adolescents.<sup>140</sup>

A few years after the Add Health data were originally published, the *Archives of Sexual Behavior* published an article by Savin-Williams and Joyner that critiqued the Add Health data on sexual attraction change.<sup>141</sup> Before outlining their critique, Savin-Williams and Joyner summarize the key Add Health findings: “in the approximately 13 years between Waves

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I and IV, regardless of whether the measure was identical across waves (romantic attraction) or discrepant in words but not in theory (romantic attraction and sexual orientation identity), approximately 80% of adolescent boys and half of adolescent girls who expressed either partial or exclusive same-sex romantic attraction at Wave I ‘turned’ heterosexual (opposite-sex attraction or exclusively heterosexual identity) as young adults.”<sup>142</sup> The authors propose three hypotheses to explain these discrepancies:

- (1) gay adolescents going into the closet during their young adult years;
- (2) confusion regarding the use and meaning of romantic attraction as a proxy for sexual orientation; and (3) the existence of mischievous adolescents who played a ‘jokester’ role by reporting same-sex attraction when none was present.<sup>143</sup>

Savin-Williams and Joyner reject the first hypothesis but find support for the second and the third. With respect to the second hypothesis, they question the use of romantic attraction to operationalize sexual identity:

To help us assess whether the construct/measurement issue (romantic attraction versus sexual orientation identity) was driving results, we compared the two constructs at Wave IV... Whereas over 99% of young adults with opposite-sex romantic attraction identified as heterosexual or mostly heterosexual and 94% of those with same-sex romantic attraction identified as homosexual or mostly homosexual, 33% of both-sex attracted men identified as heterosexual (just 6% of both-sex attracted women identified as heterosexual). These data indicated that young adult men and women generally understood the meaning of romantic attraction to the opposite- or same-sex to imply a particular (and consistent) sexual orientation identity, with one glaring exception—a substantial subset of young adult men who, despite their stated both-sex romantic attraction, identified as heterosexual.

Regarding the third hypothesis for explaining the Add Health data, Savin-Williams and Joyner note that surveys of adolescents sometimes yield unusual or distorted results due to adolescents who do not respond truthfully. The Add Health survey, they observe, had a significant number of unusual responders. For example, several hundred adolescents reported in the Wave I questionnaire that they had an artificial limb, whereas in later at-home interviews, only two of those adolescents reported having an artificial limb.<sup>144</sup> Adolescent boys who went from nonheterosexual in Wave I to heterosexual in Wave IV were significantly less likely to report

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having filled out the Wave I questionnaire honestly; these boys also displayed other significant differences, such as lower grade point averages. Additionally, like consistently heterosexual boys, boys who were inconsistent between Waves I and IV were more popular in their school with boys than girls, whereas consistently nonheterosexual boys were more popular with girls. These and other data<sup>145</sup> led the authors to conclude that “boys who emerged from a gay or bisexual adolescence to become a heterosexual young adulthood were, by-and-large, heterosexual adolescents who were either confused and did not understand the measure of romantic attraction or jokesters who decided, for reasons we were not able to detect, to dishonestly report their sexuality.”<sup>146</sup> However, the authors were not able to estimate the proportion of inaccurate responders, which would have helped evaluate the explanatory power of the hypotheses.

Later in 2014, the *Archives of Sexual Behavior* published a critique of the Savin-Williams and Joyner explanation of Add Health data by psychologist Gu Li and colleagues.<sup>147</sup> Along with criticizing the methodology of Savin-Williams and Joyner, these authors argued that the data were consistent with a scenario in which some nonheterosexual adolescents went “back into the closet” in later years as a possible reaction to social stress. (We will examine the effects of social stress on mental health in LGBT populations in Part Two of this report.) They also claimed that “it makes little sense to use responses to Wave IV sexual identity to validate or invalidate responses to Waves I or IV romantic attractions when these aspects of sexual orientation may not align in the first place.”<sup>148</sup> Regarding the jokester hypothesis, these authors pose this difficulty: “Although some participants might be ‘jokesters,’ and we as researchers should be cautious of problems associated with self-report surveys whenever analyzing and interpreting data, it is unclear why the ‘jokesters’ would answer questions about delinquency honestly, but not questions about their sexual orientation.”<sup>149</sup>

Savin-Williams and Joyner published a response to the critique in the same issue of the journal.<sup>150</sup> Responding to the criticism that their comparison of Wave IV self-reported sexual identity to Wave I self-reported romantic attractions was unsound, Savin-Williams and Joyner claimed that the results were quite similar if one used attraction as the Wave IV measure. They also deemed it highly unlikely that a large proportion of the respondents who were classified as nonheterosexuals in Wave I and heterosexuals in Wave IV went “back into the closet,” because the proportion of individuals in adolescence and young adulthood who are “out of the closet” usually increases over time.<sup>151</sup>

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The following year, the *Archives of Sexual Behavior* published another response to Savin-Williams and Joyner by psychologist Sabra Katz-Wise and colleagues, which argued that Savin-Williams and Joyner's "approach to identifying 'dubious' sexual minority youth is inherently flawed."<sup>152</sup> They wrote that "romantic attraction and sexual orientation identity are two distinct dimensions of sexual orientation that may not be concordant, even at a single time point."<sup>153</sup> They also claimed that "even if Add Health had assessed the same facets of sexual orientation at all waves, it would still be incorrect to infer 'dubious' sexual minorities from changes on the same dimension of sexual orientation, because these changes may reflect sexual fluidity."<sup>154</sup>

Unfortunately, the Add Health study does not appear to contain the data that would allow an assessment to determine which, if any, of these interpretations is likely to be correct. It may well be the case that a combination of factors contributed to the differences between the Wave I and Wave IV data. For example, there may have been some adolescents who responded to the Wave I sexual attraction questions inaccurately, some openly nonheterosexual adolescents who later went "back into the closet," and some adolescents who experienced nonheterosexual attractions before Wave I that largely disappeared by Wave IV. Other prospective study designs that track specific individuals across adolescent and adult development may shed further light on these issues.

While ambiguities in defining and characterizing sexual desire and orientation make changes in sexual desire difficult to study, data from these large, population-based national studies of randomly sampled individuals do suggest that all three dimensions of sexuality— affect, behavior, and identity— may change over time for some people. It is unclear, and current research does not address, whether and to what extent factors subject to volitional control— choice of sexual partners or sexual behaviors, for example— may influence such changes through conditioning and other mechanisms that are characterized in the behavioral sciences.

Several researchers have suggested that sexual orientation and attractions may be especially plastic for women.<sup>155</sup> For example, Lisa Diamond argued in her 2008 book *Sexual Fluidity* that "women's sexuality is fundamentally more fluid than men's, permitting greater variability in its development and expression over the life course," based on research by her and many others.<sup>156</sup>

Diamond's longitudinal five-year interviews of women in sexual relationships with other women also shed light on the problems with the concept of sexual orientation. In many cases, the women in her study

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reported not so much setting out to form a lesbian sexual relationship but rather experiencing a gradual growth of affective intimacy with a woman that eventually led to sexual involvement. Some of these women rejected the labels of “lesbian,” “straight,” or “bisexual” as being inconsistent with their lived experience.<sup>157</sup> In another study, Diamond calls into question the utility of the concept of sexual orientation, especially as it applies to females.<sup>158</sup> She points out that if the neural basis of parent-child attachment—including attachment to one’s mother—forms at least part of the basis for romantic attachments in adulthood, then it would not be surprising for a woman to experience romantic feelings for another woman without necessarily wanting to be sexually intimate with her. Diamond’s research indicates that these kinds of relationships form more often than we typically recognize, especially among women.

Some researchers have also suggested that men’s sexuality is more fluid than it was previously thought. For example, Diamond presented a 2014 conference paper, based on initial results from a survey of 394 people, entitled “I Was Wrong! Men Are Pretty Darn Sexually Fluid, Too!”<sup>159</sup> Diamond based this conclusion on a survey of men and women between the ages of 18 and 35, which asked about their sexual attractions and self-described identities at different stages of their lives. The survey found that 35% of self-identified gay men reported experiencing opposite-sex attractions in the past year, and 10% of self-identified gay men reported opposite-sex sexual behavior during the same period. Additionally, nearly as many men transitioned at some time in their life from gay to bisexual, queer, or unlabeled identity as did men from bisexual to gay identity.

In a 2012 review article entitled “Can We Change Sexual Orientation?” published in the *Archives of Sexual Behavior*, psychologist Lee Beckstead wrote, “Although their sexual behavior, identity, and attractions may change throughout their lives, this may not indicate a change in sexual orientation... but a change in awareness and an expansion of sexuality.”<sup>160</sup> It is difficult to know how to interpret this claim—that sexual behavior, identity, and attractions may change but that this does not necessarily indicate a change in sexual orientation. We have already analyzed the inherent difficulties of defining sexual orientation, but however one chooses to define this construct, it seems that the definition would somehow be tied to sexual behavior, identity, or attraction. Perhaps we can take Beckstead’s claim here as one more reason to consider dispensing with the construct of sexual orientation in the context of social science research, as it seems that whatever it might represent, it is only loosely or inconsistently tied to empirically measurable phenomena.

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Given the possibility of changes in sexual desire and attraction, which research suggests is not uncommon, any attempt to infer a stable, innate, and fixed identity from a complex and often shifting *mélange* of inner fantasies, desires, and attractions—sexual, romantic, aesthetic, or otherwise—is fraught with difficulties. We can imagine, for example, a sixteen-year-old boy who becomes infatuated with a young man in his twenties, developing fantasies centered around the other’s body and build, or perhaps on some of his character traits or strengths. Perhaps one night at a party the two engage in physical intimacy, catalyzed by alcohol and by the general mood of the party. This young man then begins an anguished process of introspection and self-exploration aimed at finding the answer to the enigmatic question, “Does this mean I’m gay?”

Current research from the biological, psychological, and social sciences suggests that this question, at least as it is framed, makes little sense. As far as science can tell us, there is nothing “there” for this young man to discover—no fact of nature to uncover or to find buried within himself. What his fantasies, or his one-time liaison, “really mean” is subject to any number of interpretations: that he finds the male figure beautiful, that he was lonely and feeling rejected the night of the party and responded to his peer’s attentions and affections, that he was intoxicated and influenced by the loud music and strobe lights, that he does have a deep-seated sexual or romantic attraction to other men, and so on. Indeed, psychodynamic interpretations of such behaviors citing unconscious motivational factors and inner conflicts, many of them interesting, most impossible to prove, can be spun endlessly.

What we can say with more confidence is that this young man had an experience encompassing complex feelings, or that he engaged in a sexual act conditioned by multiple complex factors, and that such fantasies, feelings, or associated behaviors may (or may not) be subject to change as he grows and develops. Such behaviors could become more habitual with repetition and thus more stable, or they may extinguish and recur rarely or never. The research on sexual behaviors, sexual desire, and sexual identity suggests that both trajectories are real possibilities.

### Conclusion

The concept of sexual orientation is unusually ambiguous compared to other psychological traits. Typically, it refers to at least one of three things: attractions, behaviors, or identity. Additionally, we have seen that sexual orientation often refers to several other things as well: belonging

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to a certain community, fantasies (as distinct in some respects from attractions), longings, strivings, felt needs for certain forms of companionship, and so on. It is important, then, that researchers are clear about which of these domains are being studied, and that we keep in mind the researchers' specified definitions when we interpret their findings.

Furthermore, not only can the term "sexual orientation" be understood in several different senses, most of the senses are themselves complex concepts. Attraction, for example, could refer to arousal patterns, or to romantic feelings, or to desires for company, or other things; and each of these things can be present either sporadically and temporarily or pervasively and long-term, either exclusively or not, either in a deep or shallow way, and so forth. For this reason, even specifying one of the basic senses of orientation (attraction, behavior, or identity) is insufficient for doing justice to the richly varied phenomenon of human sexuality.

In this part we have criticized the common assumption that sexual *desires*, *attractions*, or *longings* reveal some innate and fixed feature of our biological or psychological constitution, a fixed sexual *identity* or *orientation*. Furthermore, we may have some reasons to doubt the common assumption that in order to live happy and flourishing lives, we must somehow discover this innate fact about ourselves that we call *sexuality* or *sexual orientation*, and invariably express it through particular patterns of sexual behavior or a particular life trajectory. Perhaps we ought instead to consider what sorts of behaviors—whether in the sexual realm or elsewhere—tend to be conducive to health and flourishing, and what kinds of behaviors tend to undermine a healthy and flourishing life.

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*Part Two*

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## Sexuality, Mental Health Outcomes, and Social Stress

*Compared to the general population, non-heterosexual and transgender subpopulations have higher rates of mental health problems such as anxiety, depression, and suicide, as well as behavioral and social problems such as substance abuse and intimate partner violence. The prevailing explanation in the scientific literature is the social stress model, which posits that social stressors—such as stigmatization and discrimination—faced by members of these subpopulations account for the disparity in mental health outcomes. Studies show that while social stressors do contribute to the increased risk of poor mental health outcomes for these populations, they likely do not account for the entire disparity.*

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Many of the issues surrounding sexual orientation and gender identity remain controversial among researchers, but there is general agreement on the observation at the heart of Part Two: lesbian, gay, bisexual, and transgender (LGBT) subpopulations are at higher risk, compared to the general population, of numerous mental health problems. Less certain are the causes of that increased risk and thus the social and clinical approaches that may help to ameliorate it. In this part we review some of the research documenting the increased risk, focusing on papers that are data-based with sound methodology, and that are widely cited in the scientific literature.

A robust and growing body of research examines the relationships between sexuality or sexual behaviors and mental health status. The first half of this part discusses the associations of sexual identities or behaviors with psychiatric disorders (such as mood disorders, anxiety disorders, and adjustment disorders), suicide, and intimate partner violence. The second half explores the reasons for the elevated risks of these outcomes among non-heterosexual and transgender populations, and considers what social science research can tell us about one of the most prevalent ways of explaining these risks, the social stress model. As we will see, social stressors such as harassment and stigma likely explain some but not all of the elevated mental health risks for these populations. More research

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is needed to understand the causes of and potential solutions for these important clinical and public health issues.

### **Some Preliminaries**

We turn first to the evidence for the statistical links between sexual identities or behaviors and mental health outcomes. Before summarizing the relevant research, we should mention the criteria used in selecting the studies reviewed. In an attempt to distill overall findings of a large body of research, each section begins by summarizing the most extensive and reliable meta-analyses—papers that compile and analyze the statistical data from the published research literature. For some areas of research, no comprehensive meta-analyses have been conducted, and in these areas we rely on review articles that summarize the research literature without going into quantitative analyses of published data. In addition to reporting these summaries, we also discuss a few select studies that are of particular value because of their methodology, sample size, controls for confounding factors, or ways in which concepts such as heterosexuality or homosexuality are operationalized; and we discuss key studies published after the meta-analyses or review articles were published.

As we showed in Part One, explaining the exact biological and psychological origins of sexual desires and behaviors is a difficult scientific task, one that has not yet been and may never be satisfactorily completed. However, researchers can study the correlations between sexual behavior, attraction, or identity and mental health outcomes, though there may be—and often are found to be—differences between how sexual behavior, attraction, and identity relate to particular mental health outcomes. Understanding the scope of the health challenges faced by individuals who engage in particular sexual behaviors or experience certain sexual attractions is a necessary step in providing these individuals with the care they need.

### **Sexuality and Mental Health**

In a 2008 meta-analysis of research on mental health outcomes for non-heterosexuals, University College London professor of psychiatry Michael King and colleagues concluded that gays, lesbians, and bisexuals face “higher risk of suicidal behaviour, mental disorder and substance misuse and dependence than heterosexual people.”<sup>1</sup> This survey of the literature examined papers published between January 1966 and April 2005 with data from 214,344 heterosexual and 11,971 non-heterosexual individuals.

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The large sample size allowed the authors to generate estimates that are highly reliable, as indicated by the relatively small confidence intervals.<sup>2</sup>

Compiling the risk ratios found in these papers, the authors estimated that lesbian, gay, and bisexual individuals had a 2.47 times higher lifetime risk than heterosexuals for suicide attempts,<sup>3</sup> that they were about twice as likely to experience depression over a twelve-month period,<sup>4</sup> and approximately 1.5 times as likely to experience anxiety disorders.<sup>5</sup> Both non-heterosexual men and women were found to be at an elevated risk for substance abuse problems (1.51 times as likely),<sup>6</sup> with the risk for non-heterosexual women especially high—3.42 times higher than for heterosexual women.<sup>7</sup> Non-heterosexual men, on the other hand, were at a particularly high risk for suicide attempts: while non-heterosexual men and women together were at a 2.47 times greater risk of suicide attempts over their lifetimes, non-heterosexual men were found to be at a 4.28 times greater risk.<sup>8</sup>

These findings have been replicated in other studies, both in the United States and internationally, confirming a consistent and alarming pattern. However, there is considerable variation in the estimates of the increased risks of various mental health problems, depending on how researchers define terms such as “homosexual” or “non-heterosexual.” The findings from a 2010 study by Northern Illinois University professor of nursing and health studies Wendy Bostwick and colleagues examined associations of sexual orientation with mood and anxiety disorders among men and women who either identified as gay, lesbian, or bisexual, or who reported engaging in same-sex sexual behavior, or who reported feeling same-sex attractions. The study employed a large, U.S.-based random population sample, using data collected from the 2004–2005 wave of the National Epidemiologic Survey on Alcohol and Related Conditions, which was based on 34,653 interviews.<sup>9</sup> In its sample, 1.4% of respondents identified as lesbian, gay, or bisexual; 3.4% reported some lifetime same-sex sexual behavior; and 5.8% reported non-heterosexual attractions.<sup>10</sup>

Women who identified as lesbian, bisexual, or “not sure” reported higher rates of lifetime mood disorders than women who identified as heterosexual: the prevalence was 44.4% in lesbians, 58.7% in bisexuals, and 36.5% in women unsure of their sexual identity, as compared to 30.5% in heterosexuals. A similar pattern was found for anxiety disorders, with bisexual women experiencing the highest prevalence, followed by lesbians and those unsure, and heterosexual women experiencing the lowest prevalence. Examining the data for women with different sexual *behavior* or sexual *attraction* (rather than identity), those reporting sexual behavior

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with or attractions to both men and women had a higher rate of lifetime disorders than women who reported exclusively heterosexual or homosexual behaviors or attractions, and women reporting exclusive same-sex sexual behavior or exclusive same-sex attraction in fact had the *lowest* rates of lifetime mood and anxiety disorders.<sup>11</sup>

Men who identified as gay had more than double the prevalence of lifetime mood disorders compared to men who identified as heterosexual (42.3% vs. 19.8%), and more than double the rate of any lifetime anxiety disorder (41.2% vs. 18.6%), while those who identified as bisexual had a slightly lower prevalence of mood disorders (36.9%) and anxiety disorders (38.7%) than gay men. When looking at sexual attraction or behavior for men, those who reported sexual attraction to “mostly males” or sexual behavior with “both females and males” had the highest prevalence of lifetime mood disorders and anxiety disorders compared to other groups, while those reporting exclusively heterosexual attraction or behavior had the lowest prevalence of any group.

Other studies have found that non-heterosexual populations are at a higher risk of physical health problems in addition to mental health problems. A 2007 study by UCLA professor of epidemiology Susan Cochran and colleagues examined data from the California Quality of Life Survey of 2,272 adults to assess links between sexual orientation and self-reported physical health status, health conditions, and disability, as well as psychological distress among lesbians, gay men, bisexuals, and those they classified as “homosexually experienced heterosexual individuals.”<sup>12</sup> While the study, like most, was limited by the use of self-reporting of health conditions, it had several strengths: it studied a population-based sample; it separately measured identity and behavioral dimensions of sexual orientation; and it controlled for race (ethnicity), education, relationship status, and family income, among other factors.

While the authors of this study found a number of health conditions that appeared to have elevated prevalence among non-heterosexuals, after adjusting for demographic factors that are potential confounders the only group with significantly greater prevalence of non-HIV physical health conditions was bisexual women, who were more likely to have health problems than heterosexual women. Consistent with the 2010 study by Bostwick and colleagues, higher rates of psychological stress were reported by lesbians, bisexual women, gay men, and homosexually experienced heterosexual men, both before and after adjusting for demographic confounding. Among men, self-identified gay and homosexually experienced heterosexual respondents reported the highest rates of several health problems.

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Using the same California Quality of Life Survey, a 2009 study by UCLA professor of psychiatry and biobehavioral sciences Christine Grella and colleagues (including Cochran) examined the relationship between sexual orientation and receiving treatment for substance use or mental disorders.<sup>13</sup> They used a population-based sample, with sexual minorities oversampled to provide more statistical power to detect group differences. The usage of treatment was classified according to whether or not respondents reported receiving treatment in the preceding twelve months for “emotional, mental health, alcohol or other drug problems.” Sexual orientation was operationalized by a combination of behavioral history and self-identification. For example, they grouped together as “gay/bisexual” or “lesbian/bisexual” both those who identified as gay, lesbian, or bisexual, and those who had reported same-sex sexual behaviors. They found that women who were lesbian or bisexual were most likely to have received treatment, followed by men who were gay or bisexual, then heterosexual women, with heterosexual men being the least likely group to have reported receiving treatment. Overall, more than twice as many LGB individuals, compared to heterosexuals, had reported receiving treatment in the past twelve months (48.5% compared to 22.5%). The pattern was similar for men and women; 42.5% of homosexual men, compared to 17.1% of heterosexual men, had reported receiving treatment, while 55.3% of lesbian and bisexual women and 27.1% of heterosexual women reported receiving treatment. (Bostwick and colleagues had found that women with exclusively same-sex attractions and behaviors had a lower prevalence of mood and anxiety disorders compared to heterosexual women. The difference in results could be due to the fact that Grella and colleagues grouped those who identified as lesbians together with those who identified as bisexuals or who reported same-sex sexual behavior.)

A 2006 study by Columbia University psychiatry professor Theodorus Sandfort and colleagues examined a representative, population-based sample from the second Dutch National Survey of General Practice, carried out in 2001, to assess links between self-reported sexual orientation and health status among 9,511 participants, of whom 0.9% were classified as bisexual and 1.5% as gay or lesbian.<sup>14</sup> To operationalize sexual orientation, the researchers asked respondents about their sexual preference on a 5-point scale: exclusively women, predominantly women, equally men and women, predominantly men, and exclusively men. Only those who reported an equal preference for men and women were classified as bisexual, while men reporting predominant preferences for women, or women reporting a predominant preference for men were classified as heterosexual. They

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found that gay, lesbian, and bisexual respondents reported experiencing higher numbers of acute mental health problems and reported worse general mental health than heterosexuals. The results for physical health were mixed, however: lesbian and gay respondents reported experiencing more acute physical symptoms (such as headaches, back pain, or sore throats) over the past fourteen days, though they did not report experiencing two or more such symptoms any more than heterosexuals.

Lesbian and gay respondents were more likely to report chronic health problems, though bisexual men (that is, men who reported an equal sexual preference for men and women) were less likely to report chronic health problems and bisexual women were no more likely than heterosexual women to do so. The researchers did not find a statistically significant relationship between sexual orientation and overall physical health. After controlling for the possible confounding effects of mental health problems on the reporting of physical health problems, the researchers also found that the statistical effect of reporting a gay or lesbian sexual preference on chronic and acute physical conditions disappeared, though the effect of bisexual preference remained.

The Sandfort study defined sexual orientation in terms of preference or attraction without reference to behavior or self-identification, which makes it a challenge to compare its results to the results of studies that operationalize sexual orientation differently. For example, it is difficult to compare the findings of this study regarding bisexuals (defined as men or women who report an equal sexual preference for men and women) with the findings of other studies regarding “homosexually experienced heterosexual individuals” or those who are “unsure” of their sexual identity. As in most of these types of studies, the health assessments were self-reported, which may make the results somewhat unreliable. But this study also has several strengths: it used a large and representative sample of a country’s population, as opposed to the convenience samples that are sometimes used for these kinds of studies, and this sample included a sufficient number of gays and lesbians for their data to be treated in separate groups in the study’s statistical analyses. Only three people in the sample reported HIV infection, so this did not appear to be a potential confounding factor, though HIV could have been underreported.

In an effort to summarize findings in this area, we can cite the 2011 report from the Institute of Medicine (IOM), *The Health of Lesbian, Gay, Bisexual, and Transgender People*.<sup>15</sup> This report is an extensive review of scientific literature citing hundreds of studies that examine the health status of LGBT populations. The authors are scientists who are well versed

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in these issues (although we wish there had been more involvement of experts in psychiatry). The report reviews findings on physical and mental health in childhood, adolescence, early and middle adulthood, and late adulthood. Consistent with the studies cited above, this report reviews evidence showing that, compared with heterosexual youth, LGB youth are at a higher risk of depression, as well as suicide attempts and suicidal ideation. They are also more likely to experience violence and harassment and to be homeless. LGB individuals in early or middle adulthood are more prone to mood and anxiety disorders, depression, suicidal ideation, and suicide attempts.

The IOM report shows that, like LGB youth, LGB adults—and women in particular—appear to be likelier than heterosexuals to smoke, use or abuse alcohol, and abuse other drugs. The report cites a study<sup>16</sup> that found that self-identified non-heterosexuals used mental health services more often than heterosexuals, and another<sup>17</sup> that found that lesbians used mental health services at higher rates than heterosexuals.

The IOM report notes that “more research has focused on gay men and lesbians than on bisexual and transgender people.”<sup>18</sup> The relatively few studies focusing on transgender populations show high rates of mental disorders, but the use of nonprobability samples and the lack of non-transgender controls call into question the validity of the studies.<sup>19</sup> Although some studies have suggested that the use of hormone treatments may be associated with negative physical health outcomes among transgender populations, the report notes that the relevant research has been “limited” and that “no clinical trials on the subject have been conducted.”<sup>20</sup> (Health outcomes for transgender individuals will be further discussed below in this part and also in Part Three.)

The IOM report claims that the evidence that LGBT populations have worse mental and physical health outcomes is not fully conclusive. To support this claim, the IOM report cites a 2001 study<sup>21</sup> of mental health in 184 sister pairs in which one sister was lesbian and the other heterosexual. The study found no significant differences in rates of mental health problems, and found significantly higher self-esteem in the lesbian sisters. The IOM report also cites a 2003 study<sup>22</sup> that found no significant differences between heterosexual and gay or bisexual men in general happiness, perceived health, and job satisfaction. Acknowledging these caveats and the studies that do not support the general trend, the vast majority of studies cited in the report point to a generally higher risk of poor mental health status in LGBT populations compared to heterosexual populations.

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## Sexuality and Suicide

The association between sexual orientation and suicide has strong scientific support. This association merits particular attention, since among all the mental health risks, the increased risk of suicide is the most concerning, owing in part to the fact that the evidence is robust and consistent, and in part to the fact that suicide is so devastating and tragic for the person, family, and community. A better understanding of the risk factors for suicide could allow us, quite literally, to save lives.<sup>23</sup>

Sociologist and suicide researcher Ann Haas and colleagues published an extensive review article in 2011 based on the results of a 2007 conference sponsored by the Gay and Lesbian Medical Association, the American Foundation for Suicide Prevention, and the Suicide Prevention Resource Center.<sup>24</sup> They also examined studies reported since the 2007 conference. For the purposes of their report, the authors defined sexual orientation as “sexual self-identification, sexual behavior, and sexual attraction or fantasy.”<sup>25</sup>

Haas and colleagues found the association between homosexual or bisexual orientation and suicide attempts to be well supported by data. They noted that population-based surveys of U.S. adolescents since the 1990s indicate that suicide attempts are two to seven times more likely in high school students who identify as LGB, with sexual orientation being a stronger predictor in males than females. They reviewed data from New Zealand that suggested that LGB individuals were six times more likely to have attempted suicide. They cited health-related surveys of U.S. men and Dutch men and women showing same-sex behavior linked to higher risk of suicide attempts. Studies cited in the report show that lesbian or bisexual women are likelier, on average, to experience suicidal ideation, that gay or bisexual men are more likely, on average, to attempt suicide, and that lifetime suicide attempts among non-heterosexuals are greater in men than in women.

Examining studies that looked at rates of mental disorders in relation to suicidal behavior, Haas and colleagues discussed a New Zealand study<sup>26</sup> showing that gay people reporting suicide attempts had higher rates of depression, anxiety, and conduct disorder. Large-scale health surveys suggested that rates of substance abuse are up to one third higher for the LGB subpopulation. Combined worldwide studies showed up to 50% higher rates of mental disorders and substance abuse among persons self-identifying in surveys as lesbian, gay, or bisexual. Lesbian or bisexual women showed higher levels of substance abuse, while gay or bisexual men had higher rates of depression and panic disorder.

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Haas and colleagues also examined transgender populations, noting that scant information is available about transgender suicides but that the existing studies indicate a dramatic increased risk of completed suicide. (These findings are noted here but examined in more detail in Part Three.) A 1997 clinical study<sup>27</sup> estimated elevated risks of suicide for Dutch male-to-female transsexual individuals on hormone therapy, but found no significant differences in overall mortality. A 1998 international review of 2,000 persons receiving sex-reassignment surgery identified 16 possible suicides, an “alarmingly high rate of 800 suicides for every 100,000 post-surgery transsexuals.”<sup>28</sup> In a 1984 study, a clinical sample of transgender individuals requesting sex-reassignment surgery showed suicide attempt rates between 19% and 25%.<sup>29</sup> And a large sample of 40,000 mostly U.S. volunteers completing an Internet survey in 2000 found transgender persons to report higher rates of suicide attempts than any group except lesbians.<sup>30</sup>

Finally, the review by Haas and colleagues suggests that it is not clear which aspects of sexuality (identity, attraction, behavior) are most closely linked with the risk of suicidal behavior. The authors cite a 2010 study<sup>31</sup> showing that adolescents identifying as heterosexual while reporting same-sex attraction or behavior did not have significantly higher suicide rates than other self-identified heterosexuals. They also cite the large national survey of U.S. adults conducted by Wendy Bostwick and colleagues (discussed earlier),<sup>32</sup> which showed mood and anxiety disorders—key risk factors for suicidal behavior—more closely related to sexual self-identity than to behavior or attraction, especially for women.

A more recent critical review of existing studies of suicide risk and sexual orientation was presented by Austrian clinical psychologist Martin Plöderl and colleagues.<sup>33</sup> This review rejects several hypotheses developed to account for the increased suicide risk among non-heterosexuals, including biases in self-reporting and failures to measure suicide attempts accurately. The review argues that methodological improvements in studies since 1997 have provided control groups, better representativeness of study samples, and more clarity in defining both suicide attempts and sexual orientation.

The review mentions a 2001 study<sup>34</sup> by Ritch Savin-Williams, a Cornell University professor of developmental psychology, that reported no statistically significant difference between heterosexual and LGB youths after eliminating false-positive reports of suicide attempts and blaming a “‘suffering suicidal’ script” for leading to an over-reporting of suicidal behavior among gay youths. Plöderl and colleagues argue, however, that

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the Savin-Williams study's finding that there was no statistically significant difference between the suicide rates of LGB and heterosexual youths might be attributable to the small sample size, which yielded low statistical power.<sup>35</sup> The later work has not replicated this finding. Subsequent questionnaire or interview-based studies with stricter definitions of suicide attempts have found significantly increased rates of suicide attempts among non-heterosexuals. Several large-scale surveys of young people have found that the elevated risk of reported suicidal behavior increased with the severity of the attempts.<sup>36</sup> Finally, according to Plöderl and colleagues, comparing results of questionnaires with clinical interviews indicates that homosexual youth are less likely to over-report suicide attempts in surveys than heterosexual youth.

Plöderl and colleagues concluded that among psychiatric patients, homosexual or bisexual populations are over-represented in "serious suicide attempts," and that sexual orientation is one of the strongest predictors of suicide. Similarly, in nonclinical population-based studies, non-heterosexual status is found to be one of the strongest predictors of suicide attempts. The authors note:

The most exhaustive collation of published and unpublished international studies on the association of suicide attempts and sexual orientation with different methodologies has produced a very consistent picture: nearly all studies found increased incidences of self-reported suicide attempts among sexual minorities.<sup>37</sup>

In acknowledging the challenges of all such research, the authors suggest that "the major problem remains as to where one draws the line between a heterosexual or non-heterosexual orientation."<sup>38</sup>

A 1999 study by Richard Herrell and colleagues analyzed 103 middle-aged male twin pairs from the Vietnam Era Twin Registry in Hines, Illinois, in which one twin, but not the other, reported having a male sex partner after the age of 18.<sup>39</sup> The study adopted several measures of suicidality and controlled for potential confounding factors such as substance abuse or depression. It found a "substantially increased lifetime prevalence of suicidal symptoms" in male twins who had sex with men compared with co-twins who did not, independent of the potential confounding effects of drug and alcohol abuse.<sup>40</sup> Though it is a relatively small study and relied on self-reporting for both same-sex behaviors and suicidal thoughts or behaviors, it is notable for using a probability sample (which eliminates selection bias), and for using the co-twin control method (which reduces the effects of genetics, age, race, and the like).

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The study looked at middle-aged men; what the implications might be for adolescents is not clear.

In a 2011 study, Robin Mathy and colleagues analyzed the impact of sexual orientation on suicide rates in Denmark during the first twelve years after the legalization of same-sex registered domestic partnerships (RDPs) in that country, using data from death certificates issued between 1990 and 2001 as well as Danish census population estimates.<sup>41</sup> The researchers found that the age-adjusted suicide rate for same-sex RDP men was nearly eight times the rate for men in heterosexual marriages, and nearly twice the rate for men who had never married. For women, RDP status had a small, statistically insignificant effect on suicide mortality risk, and the authors conjectured that the impact of HIV status on the health of gay men might have contributed to this difference between the results for men and women. The study is limited by the fact that RDP status is an indirect measure of sexual orientation or behavior, and does not include those gays and lesbians who are not in a registered domestic partnership; the study also excluded individuals under the age of 18. Finally, the absolute number of individuals with current or past RDP status was relatively small, which may limit the study's conclusions.

Professor of pediatrics Gary Remafedi and colleagues published a 1991 study that looked at 137 males age 14–21 who self-identified as gay (88%) or bisexual (12%). Remafedi and colleagues attempted, with a case-controlled approach, to examine which factors for this population were most predictive of suicide.<sup>42</sup> Compared to those who did not attempt suicide, those who did were significantly more likely to label themselves and identify publicly as bisexual or homosexual at younger ages, report sexual abuse, and report illicit drug use. The authors noted that the likelihood of a suicide attempt “diminished with advancing age at the time of bisexual or homosexual self-labeling.” Specifically, “with each year’s delay in self-identification, the odds of a suicide attempt declined by more than 80%.”<sup>43</sup> This study is limited by using a relatively small nonprobability sample, though the authors note that its result comports with their previous finding<sup>44</sup> of an inverse relationship between psychosocial problems and the age at which one identifies as homosexual.

In a 2010 study, Plöderl and colleagues solicited self-reported suicide attempts among 1,382 Austrian adults to confirm existing evidence that homosexual and bisexual individuals are at higher risk.<sup>45</sup> To sharpen the results, the authors developed more rigorous definitions of “suicide attempts” and assessed multiple dimensions of sexual orientation, distinguishing among sexual fantasies, preferred partners, self-identification,

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recent sexual behavior, and lifetime sexual behavior. This study found an increased risk for suicide attempts for sexual minorities along all dimensions of sexual orientation. For women, the risk increases were largest for those with homosexual behaviors; for men, they were largest for homosexual or bisexual behavior in the previous twelve months and self-identification as homosexual or bisexual. Those reporting being unsure of their identity reported the highest percentage of suicide attempts (44%), although this group was small, comprising less than 1% of participants.

A 2016 meta-analysis by University of Toronto graduate student Travis Salway Hottes and colleagues aggregated data from thirty cross-sectional studies on suicide attempts that together included 21,201 sexual minority adults.<sup>46</sup> These studies used either population-based sampling or community-based sampling. Since each sampling method has its own strengths and potential biases,<sup>47</sup> the researchers wanted to examine any differences in the rates of attempted suicide between the two sampling types. Of the LGB respondents to population-based surveys, 11% reported having attempted suicide at least once, compared to 4% of heterosexual respondents to these surveys.<sup>48</sup> Of the LGB respondents to community-based surveys, 20% reported having attempted suicide.<sup>49</sup> Statistical analysis showed that the difference in the sampling methods accounted for 33% of the variation in the suicide figures reported by the studies.

The research on sexuality and the risk of suicide suggests that those who identify as gay, lesbian, bisexual, or transgender, or those who experience same-sex attraction or engage in same-sex sexual behavior are at substantially increased risk of suicidal ideation, suicide attempts, and completed suicide. In the section later in Part Two on the social stress model, we will examine—and raise questions about—one set of arguments put forward to explain these findings. Given the tragic consequences of inadequate or incomplete information in these matters and its effect on public policy and clinical care, more research into the reasons for elevated suicide risk among sexual minorities is desperately needed.

### **Sexuality and Intimate Partner Violence**

Several studies have examined the differences between rates of intimate partner violence (IPV) in same-sex couples and opposite-sex couples. The research literature examines rates of IPV *victimization* (being subjected to violence by a partner) and rates of IPV *perpetration* (committing violence against a partner). In addition to physical and sexual violence, some studies also examine psychological violence, which comprises verbal attacks,

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threats, and similar forms of abuse. The weight of evidence indicates that the rate of intimate partner violence is significantly higher among same-sex couples.

In 2014, London School of Hygiene and Tropical Medicine researcher Ana Buller and colleagues conducted a systematic review of 19 studies (with a meta-analysis of 17 of these studies) examining associations between intimate partner violence and health among men who have sex with men.<sup>50</sup> Combining the available data, they found that the pooled lifetime prevalence of any IPV was 48% (estimates from the studies were quite heterogeneous, ranging from 32% to 82%). For IPV within the previous five years, pooled prevalence was 32% (estimates ranging from 16% to 51%). IPV victimization was associated with increased rates of substance use (pooled odds ratio of 1.9), positive HIV status (pooled odds ratio of 1.5), and increased rates of depressive symptoms (pooled odds ratio of 1.5). IPV perpetration was also associated with increased rates of substance use (pooled odds ratio of 2.0). An important limitation of this meta-analysis was that the number of studies it included was relatively small. Also, the heterogeneity of the studies' results may undermine the precision of the meta-analysis. Further, most of the reviewed studies used convenience samples rather than probabilistic samples, and they used the word "partner" without distinguishing long-term relationships from casual encounters.

English psychologists Sabrina Nowinski and Erica Bowen conducted a 2012 review of 54 studies on the prevalence and correlates of intimate partner violence victimization among heterosexual and gay men.<sup>51</sup> The studies showed rates of IPV victimization for gay men ranging from 15% to 51%. Compared to heterosexual men, the review reports, "it appears that gay men experienced more total and sexual IPV, slightly less physical IPV, and similar levels of psychological IPV."<sup>52</sup> The authors also report that according to estimates of IPV prevalence over the most recent twelve months, gay men "experienced less physical, psychological and sexual IPV" than heterosexual men, though the relative lack of twelve-month estimates may make this result unreliable. The authors note that "one of the most worrying findings is the prevalence of severe sexual coercion and abuse in male same-gender relationships,"<sup>53</sup> citing a 2005 study<sup>54</sup> on IPV in HIV-positive gay men. Nowinski and Bowen found positive HIV status to be associated with IPV in both gay and heterosexual relationships. An important limitation of their review is the fact that many of the same-sex IPV studies they examined were based on small convenience samples.

Catherine Finneran and Rob Stephenson of Emory University in 2012 conducted a systematic review of 28 studies examining IPV among men

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who have sex with men.<sup>55</sup> Every study in the review estimated rates of IPV for gay men that were similar to or higher than those for all women regardless of sexual orientation. The authors conclude that “the emergent evidence reviewed here demonstrates that IPV—psychological, physical, and sexual—occurs in male-male partnerships at alarming rates.”<sup>56</sup> Physical IPV victimization was reported most frequently, with rates ranging from 12% to 45%.<sup>57</sup> The rate of sexual IPV victimization ranged from 5% to 31%, with 9 out of 19 studies reporting rates over 20%. Psychological IPV victimization was recorded in six studies, with rates ranging from 5% to 73%.<sup>58</sup> Perpetration of physical IPV was reported in eight studies, with rates ranging from 4% to 39%. Rates of perpetration of sexual IPV ranged from 0.7% to 28%; four of the five studies reviewed reported rates of 9% or more. Only one study measured perpetration of psychological violence, and the estimated prevalence was 78%. Lack of consistent research design among the studies examined (for example, some differences regarding the exact definition of IPV, the correlates of IPV examined, and the recall periods used to measure violence) makes it impossible to calculate a pooled prevalence estimate, which would be useful given the lack of a national probability-based sample.

A 2013 study by UCLA’s Naomi Goldberg and Ilan Meyer used a large probability sample of almost 32,000 individuals from the California Health Interview Survey to assess differences in intimate partner violence between various cohorts: heterosexual; self-identified gay, lesbian, and bisexual individuals; and men who have sex with men but did not identify as gay or bisexual, and women who have sex with women but did not identify as lesbian or bisexual.<sup>59</sup> All three LGB groups had greater lifetime and one-year prevalence of intimate partner violence than the heterosexual group, but this difference was only statistically significant for bisexual women and gay men. Bisexual women were more likely to have experienced lifetime IPV (52% of bisexual women vs. 22% of heterosexual women and 32% of lesbians) and to have experienced IPV in the preceding year (27% of bisexuals vs. 5% of heterosexuals and 10% of lesbians). For men, all three non-heterosexual groups had higher rates of lifetime and one-year IPV, but this was only statistically significant for gay men, who were more likely to have experienced IPV over a lifetime (27% of gay men vs. 11% of heterosexual men and 19.6% of bisexual men) and over the preceding year (12% of gay men vs. 5% of heterosexual men and 9% of bisexual men). The authors also tested whether binge drinking and psychological distress could explain the higher prevalence of IPV victimization in gay men and bisexual women; controlling for these

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variables revealed that they did not. This study is limited by the fact that other potentially confounding psychological variables (besides drinking and distress) were not controlled for, statistically or otherwise, and may have accounted for the findings.

To estimate the prevalence of battering victimization among gay partners, AIDS-prevention researcher Gregory Greenwood and colleagues published a 2002 study based on telephone interviews with a probability-based sample of 2,881 men who have sex with men (MSM) in four cities from 1996 to 1998.<sup>60</sup> Of those interviewed, 34% reported experiencing psychological or symbolic abuse, 22% reported physical abuse, and 5% reported sexual abuse. Overall, 39% reported some type of battering victimization, and 18% reported more than one type of battering in the previous five years. Men younger than 40 were significantly more likely than men over 60 to report battering violence. The authors conclude that “the prevalence of battering within the context of intimate partner relationships was very high” among their sample of men who have sex with men, and that since lifetime rates are usually higher than those for a five-year recall, “it is likely that a substantially greater number of MSM than of heterosexual men have experienced lifetime victimization.”<sup>61</sup> The five-year prevalence of physical battering among this sample of urban MSM was also “significantly higher” than the annual rate of severe violence (3%) or total violence (12%) experienced in a representative sample of heterosexual women living with men, suggesting that the estimates of battering victimization for MSM in this study “are higher than or comparable to those reported for heterosexual women.”<sup>62</sup> This study was limited by its use of a sample from four cities, so it is not clear how well the results generalize to non-urban settings.

### **Transgender Health Outcomes**

The research literature for mental health outcomes in transgender individuals is more limited than the research on mental health outcomes in LGB populations. Because people identifying as transgender make up a very small proportion of the population, large population-based surveys and studies of such individuals are difficult if not impossible to conduct. Nevertheless, the limited available research strongly suggests that transgender people have increased risks of poor mental health outcomes. It appears that the rates of co-occurring substance use disorders, anxiety disorders, depression, and suicide tend to be higher for transgender people than for LGB individuals.

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In 2015, Harvard pediatrics professor and epidemiologist Sari Reisner and colleagues conducted a retrospective matched-pair cohort study of mental health outcomes for 180 transgender subjects aged 12–29 years (106 female-to-male and 74 male-to-female), matched to non-transgender controls based on gender identity.<sup>63</sup> Transgender youth had an elevated risk of depression (50.6% vs. 20.6%)<sup>64</sup> and anxiety (26.7% vs. 10.0%).<sup>65</sup> Transgender youth also had higher risk of suicidal ideation (31.1% vs. 11.1%),<sup>66</sup> suicide attempts (17.2% vs. 6.1%),<sup>67</sup> and self-harm without lethal intent (16.7% vs. 4.4%)<sup>68</sup> relative to the matched controls. A significantly greater proportion of transgender youth accessed inpatient mental health care (22.8% vs. 11.1%)<sup>69</sup> and outpatient mental health care (45.6% vs. 16.1%)<sup>70</sup> services. No statistically significant differences in mental health status were observed when comparing female-to-male transgender individuals to the male-to-female transgender individuals after adjusting for age, race/ethnicity, and hormone use.

This study had the merit of including individuals who presented to a community-based health clinic, and who thus were not identified solely as meeting the diagnostic criteria for gender identity disorder in the fourth edition of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)*, and were not selected from a population of patients presenting to a clinic for treatment of gender identity issues. However, Reisner and colleagues note that their study has the limitations typically found in the retrospective chart review study design, such as incomplete documentation and variation in the quality of information recorded by medical professionals.

A report from the American Foundation for Suicide Prevention and the Williams Institute, a think tank for LGBT issues at the UCLA School of Law, summarized findings on suicide attempts among transgender and gender-nonconforming adults from a large national sample of over 6,000 individuals.<sup>71</sup> This constitutes the largest study of transgender and gender-nonconforming adults to date, though it used a convenience sample rather than a population-based sample. (Large population-based samples are nearly impossible given the low overall prevalence in the general population of transgendered individuals.) Summarizing the major findings of this study, the authors write:

The prevalence of suicide attempts among respondents to the National Transgender Discrimination Survey (NTDS), conducted by the National Gay and Lesbian Task Force and National Center for Transgender Equality, is 41 percent, which vastly exceeds the 4.6

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percent of the overall U.S. population who report a lifetime suicide attempt, and is also higher than the 10–20 percent of lesbian, gay and bisexual adults who report ever attempting suicide.<sup>72</sup>

The authors note that “respondents who said they had received transition-related health care or wanted to have it someday were more likely to report having attempted suicide than those who said they did not want it,” however, “the survey did not provide information about the timing of reported suicide attempts in relation to receiving transition-related health care, which precluded investigation of transition-related explanations for these patterns.”<sup>73</sup> The survey data suggested associations between suicide attempts, co-occurring mental health disorders, and experiences of discrimination or mistreatment, although the authors note some limitations of these outcomes: “The survey data did not allow us to determine a direct causal relationship between experiencing rejection, discrimination, victimization, or violence, and lifetime suicide attempts,” although they did find evidence that stressors interacted with mental health factors “to produce a marked vulnerability to suicidal behavior in transgender and gender non-conforming individuals.”<sup>74</sup>

A 2001 study by Kristen Clements-Nolle and colleagues of 392 male-to-female and 123 female-to-male transgender persons found that 62% of the male-to-female and 55% of the female-to-male transgender persons were depressed at the time of the study, and 32% of each population had attempted suicide.<sup>75</sup> The authors note: “The prevalence of suicide attempts among male-to-female and female-to-male transgender persons in our study was much higher than that found in US household probability samples and a population-based sample of adult men reporting same-sex partners.”<sup>76</sup>

### **Explanations for the Poor Health Outcomes: The Social Stress Model**

The greater prevalence of mental health problems in LGBT subpopulations is a cause for concern, and policymakers and clinicians should strive to reduce these risks. But to know what kinds of measures will help ameliorate them we must better understand their causes. At this time, the medical and social strategies for helping non-heterosexual populations in the United States are quite limited, and this may be due in part to the relatively limited explanations for the poor mental health outcomes offered by social scientists and psychologists.

Despite the limits of the scientific understanding of why non-heterosexual subpopulations are more likely to have such poor mental

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health outcomes, much of the public effort to ameliorate these problems is motivated by a particular hypothesis called the *social stress model*. This model posits that discrimination, stigmatization, and other similar stresses contribute to poor mental health outcomes among sexual minorities. An implication of the social stress model is that reducing these stresses would ameliorate the mental health problems experienced by sexual minorities.

Sexual minorities face distinct social challenges such as stigma, overt discrimination and harassment, and, often, struggle with reconciling their sexual behaviors and identities with the norms of their families and communities. In addition, they tend to be subject to challenges similar to those of some other minority populations, arising from marginalization by or conflict with the larger part of society in ways that may adversely impact their health.<sup>77</sup> Many researchers classify these various challenges under the concept of *social stress* and believe that social stress contributes to the generally higher rates of mental health problems among LGBT subpopulations.<sup>78</sup>

In attempting to account for the mental health disparities between heterosexuals and non-heterosexuals, researchers occasionally refer to a social or minority stress *hypothesis*.<sup>79</sup> However, it is more accurate to refer to a social or minority stress *model*, because the postulated connection between social stress and mental health is more complex and less precise than anything that could be stated as a single hypothesis.<sup>80</sup> The term *stress* can have a number of meanings, ranging from a description of a physiological condition to a mental or emotional state of anger or anxiety to a difficult social, economic, or interpersonal situation. More questions arise when one thinks about various kinds of *stressors* that may disproportionately affect mental health in minority populations. We will discuss some of these aspects of the social stress model after a concise overview of the model as it has been presented in recent literature on LGBT mental health.

The social stress model attempts to explain why non-heterosexual people have, on average, higher incidences of poor mental health outcomes than the rest of the population. It does not put forth a complete explanation for the disparities between non-heterosexuals and heterosexuals, and it does not explain the mental health problems of a particular patient. Rather, it describes social factors that might directly or indirectly influence the health risks for LGBT people, which may only become apparent at a population level. Some of these factors may also influence heterosexuals, but LGBT people are probably disproportionately exposed to them.

In an influential 2003 article on the social stress model, psychiatric epidemiologist and sexual orientation law expert Ilan Meyer distinguished between *distal* and *proximate* minority stressors. Distal stressors do not

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depend on the individual's "perceptions or appraisals," and thus "can be seen as independent of personal identification with the assigned minority status."<sup>81</sup> For instance, if a man who was perceived to be gay by an employer was fired on that basis, this would be a distal stressor, since the stressful event of discrimination would have had nothing to do with whether the man actually identified as gay, but only with someone else's attitude and perception. Distal stressors tend to reflect social circumstances rather than the individual's reaction to those circumstances. Proximate stressors, in contrast, are more subjective and are closely related to the individual's self-identity as lesbian, gay, bisexual, or transgender. An example of a proximate stressor would be when a young woman personally identifies as being a lesbian, and chooses to hide that identity from her family members out of fear of disapproval, or because of an internal sense of shame. The effects of proximate stressors such as this one are highly dependent on the individual's self-understanding and unique social circumstances. In this section we describe the types of stressors postulated in the social stress model, starting at the distal and proceeding to the most proximate stressors, and examine some of the empirical evidence that has been offered on the links between the stressors and mental health outcomes.

***Discrimination and prejudice events.*** Overt acts of mistreatment, ranging from violence to harassment and discrimination, are categorized together by researchers as "prejudice events." These are thought to be significant stressors for non-heterosexual populations.<sup>82</sup> Surveys of LGBT subpopulations have found that they tend to experience these kinds of prejudice events more frequently than the general population.<sup>83</sup>

The available evidence indicates that prejudice events likely contribute to mental health problems. A 1999 study by UC Davis professor of psychology Gregory Herek and colleagues using survey data from 2,259 LGB individuals in Sacramento found that self-identified lesbians and gays who experienced a bias crime in the preceding five years—a crime, such as assault, theft, or vandalism, motivated by the actual or perceived sexual identity of the victim—reported significantly higher levels of depressive symptoms, traumatic stress symptoms, and anxiety than lesbians and gays who had not experienced a bias crime over that same period.<sup>84</sup> Additionally, lesbians and gays who reported being the victims of bias crimes in the last five years showed significantly higher levels of depressive and traumatic stress symptoms than individuals who experienced non-bias crimes in the same period (though the two groups did not display significant differences in anxiety). Comparable significant correlations were not found for

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self-identified bisexuals, who constituted a much smaller portion of the survey respondents. The study also found that lesbians and gays subject to bias crimes were significantly more likely than other respondents to report feelings of vulnerability and a decreased sense of personal mastery or agency. Corroborating these findings on the harmful impact of bias crimes was a 2001 study by Northeastern University social scientist Jack McDevitt and colleagues that examined aggravated assaults using data from the Boston Police Department.<sup>85</sup> They found that bias crime victims tended to experience the effects of victimization more intensely and for a longer period of time than non-bias crime victims. (The study looked at bias-motivated assaults in general, rather than restricting its analysis to assaults motivated by LGBT bias, though a substantial portion of the subjects did experience assaults motivated by their non-heterosexual status.)

Similar patterns also appear among non-heterosexual adolescents, for whom maltreatment is particularly high.<sup>86</sup> In a 2011 study, University of Arizona social and behavioral scientist Stephen T. Russell and colleagues analyzed a survey of 245 young LGBT adults that retrospectively assessed school victimization due to actual or perceived LGBT status between the ages of 13 and 19. They found strong correlations between school victimization and poor mental health as young adults.<sup>87</sup> Victimization was assessed by asking yes-or-no questions, such as, “During my middle or high school years, while at school, I was pushed, shoved, slapped, hit, or kicked by someone who wasn’t just kidding around,” followed by a question of how often these events were related to the respondent’s sexual identity. Respondents who reported high levels of school victimization due to their sexual identity were 2.6 times more likely to report depression as young adults and 5.6 times more likely to report that they had attempted suicide, compared to those who reported low levels of victimization. These differences were highly statistically significant, though the study is potentially limited by its use of retrospective surveys to measure incidents of victimization. A study by professor of social work Joanna Almeida and colleagues, which relied on the 2006 Boston Youth Survey (a biennial survey of high school students in Boston public schools), found that perceptions of having been victimized due to LGBT status accounted for increased symptoms of depression among LGBT students. For male LGBT students, but not females, the study also found a positive correlation between victimization and suicidal thoughts and self-harm.<sup>88</sup>

Differences in compensation suggest discrimination in the workplace, which can have both direct and indirect effects on mental health. M. V. Lee Badgett, a professor of economics at the University of Massachusetts,

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Amherst, analyzed data collected between 1989 and 1991 in the General Social Survey and found that non-heterosexual male employees received significantly lower compensation (11% to 27%) than heterosexuals, even after controlling for experience, education, occupation, and other factors.<sup>89</sup> According to a 2009 review by Badgett,<sup>90</sup> nine studies from the 1990s and early 2000s “consistently show that gay and bisexual men earned 10% to 32% less than heterosexual men,” and that differences in occupation cannot account for much of the wage disparity. Researchers have also found that non-heterosexual women earn more than heterosexual women,<sup>91</sup> which may suggest either that patterns of discrimination differ for men and women, or that there are other factors associated with non-heterosexual behavior and self-identification in men and women influencing their respective earnings, such as a lower rate of child-rearing or being the family primary wage earner.

There is evidence that suggests that wage disparities can help explain some population-level disparities in mental health outcomes,<sup>92</sup> though it is difficult to tell if differences in mental health help explain the differences in wages. A 1999 study<sup>93</sup> by Craig Waldo on the relationship between workplace heterosexism—defined as negative social attitudes toward non-heterosexuals—and stress-related outcomes in 287 LGB individuals found that LGB individuals who experienced heterosexism in the workplace “exhibited higher levels of psychological distress and health-related problems, as well as decreased satisfaction with several aspects of their jobs.” The cross-sectional data used by many of these studies make it impossible to infer causality, though both prospective studies and qualitative analyses of the impact of unemployment on mental health suggest that at least some of the correlations are likely accounted for by the psychological and material effects of unemployment.<sup>94</sup>

**Stigma.** Sociologists have for many years documented a range of adverse effects of stigma on individuals, ranging from issues with self-esteem to academic achievement.<sup>95</sup> Stigma is typically regarded as an attribute attaching to a person that reduces that person’s worth to others in a particular social context.<sup>96</sup> These negative evaluations are in many cases widely shared among a cultural group and become the basis for excluding or differentially treating stigmatized individuals. For example, mental illness can become stigmatized when it is regarded as a character flaw in mentally ill people. One reason why stigma serves an important role in the social stress model is that it can be invoked as an explanation even in the absence of particular events of discrimination or maltreatment. For

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example, stigmatization of depression may take place when a depressed person conceals the depression on the expectation that friends and family members will regard it as a character flaw. Even when this concealment is successful, and there is therefore no actual discrimination or mistreatment by the individual's friends or family, anxiety over the attitudes others may have can affect the depressed person's emotional and mental well-being.

Researchers have found associations between the risk of poor mental health and stigma toward certain populations, though there has been little empirical research on the mental health effects of stigma on LGBT people in particular. Stigma is not easy to define or operationalize, making it a difficult and vague concept for empirical social scientists to study. Nevertheless, researchers have attempted to work with the concept using surveys of self-perceived devaluation by others and have found correlations between experiences of stigma and the risk of poor mental health status. One highly cited 1997 study by sociologist and epidemiologist Bruce Link and colleagues on the connection between stigma and mental health found a "strong and enduring" negative effect of stigma on the mental well-being of men who were suffering from a mental disorder and substance abuse.<sup>97</sup> In this study, the effects of stigma appeared to persist even after the men had received largely successful treatment for their original mental and substance abuse problems. The study found significant correlations between certain stigma variables—self-reported experiences of devaluation and rejection—and depressive symptoms before and after treatment, suggesting that the effects of stigma are relatively long-lasting. This might simply indicate that people with depressive symptoms tend to report more stigma, but if that were the case, one would have expected reports of stigma to decline over the course of the treatment program, as depression did. However, since stigma reports stayed constant, the authors concluded that stigma must have had a causal role in shaping depressive symptoms. It is worth noting that this study found stigma variables to account uniquely for around 10% or slightly more of the variance in depressive symptoms—in other words, stigma had a minor effect on depressive symptoms, though such an effect might manifest itself in significant ways on a population level. Some other researchers have suggested that the effects of stigma are usually minor and transitory; for example, Vanderbilt sociologist Walter Gove argued that for the "vast majority of cases the stigma [experienced by mental patients] appears to be transitory and does not appear to pose a severe problem."<sup>98</sup>

Researchers have relatively recently begun pursuing both empirical and theoretical work<sup>99</sup> on how stigma affects the mental health of LGBT

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people, though there has been some controversy over the magnitude and duration of effects due to stigma. Some of the controversy may stem from the difficulty of defining and quantifying stigma as well as the variations in stigma across different social contexts. A 2013 study by Columbia University medical psychologist Walter Bockting and colleagues on mental health in 1,093 transgender people found a positive correlation between psychological distress and both enacted and felt stigma, which were measured using survey questions.<sup>100</sup> A 2003 study<sup>101</sup> by clinical psychologist Robin Lewis and colleagues of predictors of depressive symptoms in 201 LGB individuals found that stigma consciousness was significantly associated with depressive symptoms, where stigma consciousness was assessed using a ten-item questionnaire that assessed “the degree to which one expects to be judged on the basis of a stereotype.”<sup>102</sup> However, depressive symptoms are often associated with negative cognition about the self, the world, and the future, and this may contribute to the subjective perception of stigmatization among individuals suffering from depression.<sup>103</sup> A 2011 study<sup>104</sup> by Bostwick that also used measures of stigma consciousness and depressive symptoms found a modest positive correlation between stigma scores and depressive symptoms in bisexual women, although the study was limited by having a relatively small sample size. However, a 2003 longitudinal study<sup>105</sup> of Norwegian adolescents by psychologist Lars Wichstrøm and colleague found that sexual orientation was associated with poor mental health status after accounting for a variety of psychological risk factors, including self-worth. While this study did not directly consider stigma as a risk factor, it suggests that psychological factors such as stigma consciousness alone likely cannot fully account for the disparities in mental health between heterosexuals and non-heterosexuals. Additionally, it is important to note that due to the cross-sectional design of these studies, causal inferences cannot be supported by the data—different kinds of data and more evidence would be needed to support conclusions about causal relationships. In particular, it is impossible to prove through these studies that stigma leads to poor mental health, as opposed to, for example, poor mental health leading people to report higher levels of stigma, or a third factor being responsible for both poor mental health and higher levels of stigma.

**Concealment.** Stigma may affect non-heterosexual individuals’ decisions about whether to disclose or conceal their sexual orientation. LGBT people may decide to conceal their sexual orientation to protect themselves against possible bias or discrimination, to avoid a sense of shame, or to

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avoid a potential conflict between their social role and sexual desires or behaviors.<sup>106</sup> Particular contexts in which LGBT people may be more likely to conceal their sexual orientation include school, work, and other places in which they feel that disclosure could negatively affect the way that people regard them.

There is a large amount of evidence from psychological research indicating that concealment of an important aspect of one's identity may have adverse mental health consequences. In general, expressing one's emotions and sharing important aspects of one's life with others play large roles in maintaining mental health.<sup>107</sup> Recent decades have seen a growing body of research on the relationships between concealment and disclosure and mental health in LGBT subpopulations.<sup>108</sup> For example, a 2007 study<sup>109</sup> by Belle Rose Ragins and colleagues of workplace concealment and disclosure in 534 LGB individuals found that fear of disclosing was associated with psychological strain and other outcomes such as job satisfaction. However, the study also challenged the notion that disclosure leads to positive psychological and social outcomes, since employees' disclosure was not significantly associated with most of the outcome variables. The authors interpret this result by saying that "this study suggests that concealment may be a necessary and adaptive decision in an unsupportive or hostile environment, thus underscoring the importance of social context."<sup>110</sup> Due to the relatively rapid changes in social acceptance of same-sex marriage and of same-sex relationships more broadly in recent decades,<sup>111</sup> it is possible that some of the research on the psychological effects of concealment and disclosure is outdated, because in general there may now be less pressure for those identifying as LGB to conceal their identities.

***Testing the model.*** One of the implications of the social stress model is that reducing the amount of discrimination, prejudice, and stigmatization of sexual minorities would help reduce the rates of mental health problems for these populations. Some jurisdictions have sought to reduce these social stressors by passing anti-discrimination and hate-crime laws. If such policies are in fact successful at reducing these stressors then they could be expected to reduce the rates of mental health problems in LGB populations to the extent that the social stress model accurately accounts for the causes of these problems. So far, studies have not been designed in such a way that could allow them to test conclusively the hypothesis that social stress accounts for the high rates of poor mental health outcomes in non-heterosexual populations, but there is research that provides some data on a testable implication of the social stress model.

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A 2009 study by sociomedical scientist Mark Hatzenbuehler and colleagues investigated the association between psychiatric morbidity in LGB populations and two state-level policies that pertained to these populations: hate-crime laws that did not include sexual orientation as a protected category, and laws prohibiting employment discrimination based on sexual orientation.<sup>112</sup> The study used data on mental health outcomes from Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), a nationally representative sample of 34,653 civilian, non-institutionalized adults, and measuring psychiatric disorders according to *DSM-IV* criteria.<sup>113</sup> Wave 2 of NESARC took place in 2004–2005. Of the sample, 577 respondents identified as lesbian, gay, or bisexual. The analysis of the data showed that LGB individuals living in states with no hate-crime laws and no non-discrimination laws tended to have higher odds of psychiatric morbidity (compared to LGB individuals in states with one or two protective laws), but the analysis found statistically significant correlations only for dysthymia (a less severe but more persistent form of depression), generalized anxiety disorder, and post-traumatic stress disorder, while the correlations between seven other psychiatric conditions investigated were not found to be statistically significant. No epidemiological inferences can be made due to the nature of the data, suggesting the need for more studies on this and similar topics.

Hatzenbuehler and colleagues attempted to improve on this cross-sectional study by doing a prospective study, published in 2010, this time examining changes in psychiatric morbidity over the period in which certain states passed constitutional amendments defining marriage as a union between one man and one woman—amendments that were described by the study’s authors as “bans on gay marriage.”<sup>114</sup> The authors examined differences in psychiatric morbidity between Wave 1 of NESARC, which took place in 2001–2002, and Wave 2, which coincided with the 2004 and 2005 state-constitutional amendments. They observed that the prevalence in mood disorders in LGB respondents living in states that passed marriage amendments increased by 36.6% between Waves 1 and 2. Mood disorders for LGB respondents living in states that did not pass marriage amendments decreased by 23.6%, though this change was not statistically significant. The prevalence of certain disorders increased both in states that passed such amendments and in states that did not. Generalized anxiety disorder, for example, increased in both, but by a much larger and statistically significant magnitude in states that passed marriage amendments. Hatzenbuehler and colleagues found that drug-use disorders increased more in states that did *not* pass marriage amendments,

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and the increase was statistically significant only for those states. (Total substance abuse disorders increased in both cases, by a roughly similar amount.) As with the earlier cross-sectional study, for the majority of the psychiatric conditions investigated there were no significant correlations between the conditions and the social policies that were hypothesized to have an influence on mental health outcomes.

Some of the limitations of the study's findings noted by the authors include the following: healthier LGB respondents may have moved out of the states that would eventually pass marriage amendments into the states that would not; sexual orientation was only assessed during Wave 2 of NESARC, and there is some fluidity to sexual identity that may have led to misclassification of some LGB respondents; and the sample size of LGB respondents living in states that passed marriage amendments was relatively small, limiting the statistical power of the study.

One hypothesized causal mechanism for the change in mental health variables associated with the marriage amendments is that the public debate surrounding the amendments may have elevated the stress experienced by non-heterosexuals—a hypothesis that was put forward by psychologist Sharon Scales Rostosky and colleagues in a study of the attitudes of LGB adults in states that passed marriage amendments in 2006.<sup>115</sup> The survey data collected during this study showed that LGB respondents living in states that passed marriage amendments in 2006 had higher levels of various kinds of psychological distress, including stress and depressive symptoms. The study also found that participation in LGBT activism during the election season was associated with increased psychological distress. It may be that part of the psychological distress recorded by this survey, which included perceived stress, depressive symptoms (but not diagnoses of depressive disorders), and what the researchers called “amendment-related affect,” may have simply reflected the typical feelings of advocates when they experience political defeat on an issue that they care passionately about. Other key limitations of the study were its cross-sectional design and its reliance on volunteers for the survey (in contrast to the previous study by Hatzenbuehler and colleagues). The survey methodology may also have biased the results—the researchers advertised on websites and through listserv e-mail announcements that they were looking for survey respondents for a study on “attitudes and experiences of LGB...individuals regarding the debate” over gay marriage. As with many forms of convenience sampling, individuals with strong attitudes regarding the issues under investigation in the survey may have been more likely to respond.

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As for the effects of particular policies, the evidence is equivocal at best. The 2009 study by Hatzenbuehler and colleagues demonstrated significant correlations between the risk of some (though not all) mental health problems in the LGB subpopulation and state policies on hate crime and employment protections. Even for the aspects of mental health that this study found to be correlated with hate-crime or employment-protection policies, the study was unable to show an epidemiological relationship between policies and health outcomes.

### Conclusion

The social stress model probably accounts for some of the poor mental health outcomes experienced by sexual minorities, though the evidence supporting the model is limited, inconsistent and incomplete. Some of the central concepts of the model, such as stigmatization, are not easily operationalized. There is evidence linking some forms of mistreatment, stigmatization, and discrimination to some of the poor mental health outcomes experienced by non-heterosexuals, but it is far from clear that these factors account for all of the disparities between the heterosexual and non-heterosexual populations. Those poor mental health outcomes may be mitigated to some extent by reducing social stressors, but this strategy is unlikely to eliminate all of the disparities in mental health status between sexual minorities and the wider population. Other factors, such as the elevated rates of sexual abuse victimization among the LGBT population discussed in Part One, may also account for some of these mental health disparities, as research has consistently shown that “survivors of childhood sexual abuse are significantly at risk of a wide range of medical, psychological, behavioral, and sexual disorders.”<sup>116</sup>

Just as it does a disservice to non-heterosexual subpopulations to ignore or downplay the statistically higher risks of negative mental health outcomes they face, so it does them a disservice to misattribute the causes of these elevated risks, or to ignore other potential factors that may be at work. Assuming that a single model can explain all of the mental health risks faced by non-heterosexuals can mislead clinicians and therapists charged with helping this vulnerable subpopulation. The social stress model deserves further research, but should not be assumed to offer a complete explanation of the causes of mental health disparities if clinicians and policymakers want to adequately address the mental health challenges faced by the LGBT community. More research is needed to explore the causes of, and solutions to, these important public health challenges.

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*Part Three*

## Gender Identity

*The concept of biological sex is well defined, based on the binary roles that males and females play in reproduction. By contrast, the concept of gender is not well defined. It is generally taken to refer to behaviors and psychological attributes that tend to be typical of a given sex. Some individuals identify as a gender that does not correspond to their biological sex. The causes of such cross-gender identification remain poorly understood. Research investigating whether these transgender individuals have certain physiological features or experiences in common with the opposite sex, such as brain structures or atypical prenatal hormone exposures, has so far been inconclusive. Gender dysphoria—a sense of incongruence between one’s biological sex and one’s gender, accompanied by clinically significant distress or impairment—is sometimes treated in adults by hormones or surgery, but there is little scientific evidence that these therapeutic interventions have psychological benefits. Science has shown that gender identity issues in children usually do not persist into adolescence or adulthood, and there is little scientific evidence for the therapeutic value of puberty-delaying treatments. We are concerned by the increasing tendency toward encouraging children with gender identity issues to transition to their preferred gender through medical and then surgical procedures. There is a clear need for more research in these areas.*

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As described in Part One, there is a widely held belief that *sexual orientation* is a well-defined concept, and that it is innate and fixed in each person—as it is often put, gay people are “born that way.” Another emerging and related view is that *gender identity*—the subjective, internal sense of being a man or a woman (or some other gender category)—is also fixed at birth or at a very early age and can diverge from a person’s biological sex. In the case of children, this is sometimes articulated by saying that a little boy may be trapped in a little girl’s body, or vice versa.

In Part One we argued that scientific research does not give much support to the hypothesis that sexual orientation is innate and fixed. We will argue here, similarly, that there is little scientific evidence that gender identity is fixed at birth or at an early age. Though biological sex is innate, and gender identity and biological sex are related in complex ways, they

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are not identical; gender is sometimes defined or expressed in ways that have little or no biological basis.

### Key Concepts and Their Origins

To clarify what is meant by “gender” and “sex,” we begin with a widely used definition, here quoted from a pamphlet published by the American Psychological Association (APA):

*Sex* is assigned at birth, refers to one’s biological status as either male or female, and is associated primarily with physical attributes such as chromosomes, hormone prevalence, and external and internal anatomy. *Gender* refers to the socially constructed roles, behaviors, activities, and attributes that a given society considers appropriate for boys and men or girls and women. These influence the ways that people act, interact, and feel about themselves. While aspects of biological sex are similar across different cultures, aspects of gender may differ.<sup>1</sup>

This definition points to the obvious fact that there are social norms for men and women, norms that vary across different cultures and that are not simply determined by biology. But it goes further in holding that gender is wholly “socially constructed”—that it is detached from biological sex. This idea has been an important part of a feminist movement to reform or eliminate traditional gender roles. In the classic feminist book *The Second Sex* (1949), Simone de Beauvoir wrote that “one is not born, but becomes a woman.”<sup>2</sup> This notion is an early version of the now familiar distinction between sex as a biological designation and gender as a cultural construct: though one is born, as the APA explains, with the “chromosomes, hormone prevalence, and external and internal anatomy” of a female, one is socially conditioned to take on the “roles, behaviors, activities, and attributes” of a woman.

Developments in feminist theory in the second half of the twentieth century further solidified the position that gender is socially constructed. One of the first to use the term “gender” as distinct from sex in the social-science literature was Ann Oakley in her 1972 book, *Sex, Gender and Society*.<sup>3</sup> In the 1978 book *Gender: An Ethnomethodological Approach*, psychology professors Suzanne Kessler and Wendy McKenna argued that “gender is a social construction, that a world of two ‘sexes’ is a result of the socially shared, taken for granted methods which members use to construct reality.”<sup>4</sup>

Anthropologist Gayle Rubin expresses a similar view, writing in 1975 that “Gender is a socially imposed division of the sexes. It is a product of

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the social relations of sexuality.”<sup>5</sup> According to her argument, if it were not for this social imposition, we would still have males and females but not “men” and “women.” Furthermore, Rubin argues, if traditional gender roles are socially constructed, then they can also be *deconstructed*, and we can eliminate “obligatory sexualities and sex roles” and create “an androgynous and genderless (though not sexless) society, in which one’s sexual anatomy is irrelevant to who one is, what one does, and with whom one makes love.”<sup>6</sup>

The relationship between gender theory and the deconstruction or overthrowing of traditional gender roles is made even clearer in the works of the influential feminist theorist Judith Butler. In works such as *Gender Trouble: Feminism and the Subversion of Identity* (1990)<sup>7</sup> and *Undoing Gender* (2004)<sup>8</sup> Butler advances what she describes as “performativity theory,” according to which being a woman or man is not something that one *is* but something that one *does*. “Gender is neither the causal result of sex nor as seemingly fixed as sex,” as she put it.<sup>9</sup> Rather, gender is a constructed status radically independent from biology or bodily traits, “a free floating artifice, with the consequence that *man* and *masculine* might just as easily signify a female body as a male one, and *woman* and *feminine* a male body as easily as a female one.”<sup>10</sup>

This view, that gender and thus gender identity are fluid and plastic, and not necessarily binary, has recently become more prominent in popular culture. An example is Facebook’s move in 2014 to include 56 new ways for users to describe their gender, in addition to the options of male and female. As Facebook explains, the new options allow the user to “feel comfortable being your true, authentic self,” an important part of which is “the expression of gender.”<sup>11</sup> Options include *agender*, several *cis-* and *trans-* variants, *gender fluid*, *gender questioning*, *neither*, *other*, *pangender*, and *two-spirit*.<sup>12</sup>

Whether or not Judith Butler was correct in describing traditional gender roles of men and women as “performative,” her theory of gender as a “free-floating artifice” does seem to describe this new taxonomy of gender. As these terms multiply and their meanings become more individualized, we lose any common set of criteria for defining what gender distinctions mean. If gender is entirely detached from the binary of biological sex, gender could come to refer to any distinctions in behavior, biological attributes, or psychological traits, and each person could have a gender defined by the unique combination of characteristics the person possesses. This *reductio ad absurdum* is offered to present the possibility that defining gender too broadly could lead to a definition that has little meaning.

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Alternatively, gender identity could be defined in terms of sex-typical traits and behaviors, so that being a boy means behaving in the ways boys typically behave—such as engaging in rough-and-tumble play and expressing an interest in sports and liking toy guns more than dolls. But this would imply that a boy who plays with dolls, hates guns, and refrains from sports or rough-and-tumble play might be considered to be a girl, rather than simply a boy who represents an exception to the typical patterns of male behavior. The ability to recognize exceptions to sex-typical behavior relies on an understanding of maleness and femaleness that is independent of these stereotypical sex-appropriate behaviors. The underlying basis of maleness and femaleness is the distinction between the reproductive roles of the sexes; in mammals such as humans, the female gestates offspring and the male impregnates the female. More universally, the male of the species fertilizes the egg cells provided by the female of the species. This conceptual basis for sex roles is binary and stable, and allows us to distinguish males from females on the grounds of their reproductive systems, even when these individuals exhibit behaviors that are not typical of males or females.

To illustrate how reproductive roles define the differences between the sexes even when behavior appears to be atypical for the particular sex, consider two examples, one from the diversity of the animal kingdom, and one from the diversity of human behavior. First, we look at the emperor penguin. Male emperor penguins provide more care for eggs than do females, and in this sense, the male emperor penguin could be described as more maternal than the female.<sup>13</sup> However, we recognize that the male emperor penguin is not in fact female but rather that the species represents an exception to the general, but not universal, tendency among animals for females to provide more care than males for offspring. We recognize this because sex-typical behaviors like parental care do not define the sexes; the individual's role in sexual reproduction does.

Even other sex-typical biological traits, such as chromosomes, are not necessarily helpful for defining sex in a universal way, as the penguin example further illustrates. As with other birds, the genetics of sex determination in the emperor penguin is different than the genetics of sex determination in mammals and many other animals. In humans, males have XY chromosomes and females have XX chromosomes; that is, males have a unique sex-determining chromosome that they do not share with females, while females have two copies of a chromosome that they share with males. But in birds, it is females, not males, that have and pass on the sex-specific chromosome.<sup>14</sup> Just as the observation that

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male emperor penguins nurture their offspring more than their partners did not lead zoologists to conclude that the egg-laying member of the emperor penguin species was in fact the male, the discovery of the ZW sex-determination system in birds did not lead geneticists to challenge the age-old recognition that hens are females and roosters are males. The only variable that serves as the fundamental and reliable basis for biologists to distinguish the sexes of animals is their role in reproduction, not some other behavioral or biological trait.

Another example that, in this case, only appears to be non-sex-typical behavior is that of Thomas Beatie, who made headlines as a man who gave birth to three children between 2008 and 2010.<sup>15</sup> Thomas Beatie was born a woman, Tracy Lehanani LaGondino, and underwent a surgical and legal transition to living as a man before deciding to have children. Because the medical procedures he underwent did not involve the removal of his ovaries or uterus, Beatie was capable of bearing children. The state of Arizona recognizes Thomas Beatie as the father of his three children, even though, biologically, he is their mother. Unlike the case of the male emperor penguin's ostensibly maternal, "feminine" parenting behavior, Beatie's ability to have children does not represent an exception to the normal inability of males to bear children. The labeling of Beatie as a man despite his being biologically female is a personal, social, and legal decision that was made without any basis in biology; nothing whatsoever in biology suggests Thomas Beatie is a male.

In biology, an organism is male or female if it is structured to perform one of the respective roles in reproduction. This definition does not require any arbitrary measurable or quantifiable physical characteristics or behaviors; it requires understanding the reproductive system and the reproduction process. Different animals have different reproductive systems, but sexual reproduction occurs when the sex cells from the male and female of the species come together to form newly fertilized embryos. It is these reproductive roles that provide the conceptual basis for the differentiation of animals into the biological categories of male and female. There is no other widely accepted biological classification for the sexes.

But this definition of the biological category of sex is not universally accepted. For example, philosopher and legal scholar Edward Stein maintains that infertility poses a crucial problem for defining sex in terms of reproductive roles, writing that defining sex in terms of these roles would define "infertile males as females."<sup>16</sup> Since an infertile male cannot play the reproductive role for which males are structured, and an infertile

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female cannot play the reproductive role for which females are structured, according to this line of thinking, defining sex in terms of reproductive roles would not be appropriate, as infertile males would be classified as females, and infertile females as males. Nevertheless, while a reproductive system structured to serve a particular reproductive role may be impaired in such a way that it cannot perform its function, the system is still recognizably structured for that role, so that biological sex can still be defined strictly in terms of the structure of reproductive systems. A similar point can be made about heterosexual couples who choose not to reproduce for any of a variety of reasons. The male and female reproductive systems are generally clearly recognizable, regardless of whether or not they are being used for purposes of reproduction.

The following analogy illustrates how a system can be recognized as having a particular purpose, even when that system is dysfunctional in a way that renders it incapable of carrying out its purpose: Eyes are complex organs that function as processors of vision. However, there are numerous conditions affecting the eye that can impair vision, resulting in blindness. The eyes of the blind are still recognizably organs structured for the function of sight. Any impairments that result in blindness do not affect the purpose of the eye—any more than wearing a blindfold—but only its function. The same is true for the reproductive system. Infertility can be caused by many problems. However, the reproductive system continues to exist for the purpose of begetting children.

There are individuals, however, who are biologically “intersex,” meaning that their sexual anatomy is ambiguous, usually for reasons of genetic abnormalities. For example, the clitoris and penis are derived from the same embryonic structures. A baby may display an abnormally large clitoris or an abnormally small penis, causing its biological sex to be difficult to determine long after birth.

The first academic article to use the term “gender” appears to be the 1955 paper by the psychiatry professor John Money of Johns Hopkins on the treatment of “intersex” children (the term then used was “hermaphrodites”).<sup>17</sup> Money posited that gender identity, at least for these children, was fluid and that it could be constructed. In his mind, making a child identify with a gender only required constructing sex-typical genitalia and creating a gender-appropriate environment for the child. The chosen gender for these children was often female—a decision that was not based on genetics or biology, nor on the belief that these children were “really” girls, but, in part, on the fact that at the time it was easier surgically to construct a vagina than it was to construct a penis.

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The most widely known patient of Dr. Money was David Reimer, a boy who was not born with an intersex condition but whose penis was damaged during circumcision as an infant.<sup>18</sup> David was raised by his parents as a girl named Brenda, and provided with both surgical and hormonal interventions to ensure that he would develop female-typical sex characteristics. However, the attempt to conceal from the child what had happened to him was not successful—he self-identified as a boy, and eventually, at the age of 14, his psychiatrist recommended to his parents that they tell him the truth. David then began the difficult process of reversing the hormonal and surgical interventions that had been performed to feminize his body. But he continued to be tormented by his childhood ordeal, and took his own life in 2004, at the age of 38.

David Reimer is just one example of the harm wrought by theories that gender identity can socially and medically be reassigned in children. In a 2004 paper, William G. Reiner, a pediatric urologist and child and adolescent psychiatrist, and John P. Gearhart, a professor of pediatric urology, followed up on the sexual identities of 16 genetic males affected by cloacal exstrophy—a condition involving a badly deformed bladder and genitals. Of the 16 subjects, 14 were assigned female sex at birth, receiving surgical interventions to construct female genitalia, and were raised as girls by their parents; 6 of these 14 later chose to identify as males, while 5 continued to identify as females and 2 declared themselves males at a young age but continued to be raised as females because their parents rejected the children's declarations. The remaining subject, who had been told at age 12 that he was born male, refused to discuss sexual identity.<sup>19</sup> So the assignment of female sex persisted in only 5 of the 13 cases with known results.

This lack of persistence is some evidence that the assignment of sex through genital construction at birth with immersion into a “gender-appropriate” environment is not likely to be a successful option for managing the rare problem of genital ambiguity from birth defects. It is important to note that the ages of these individuals at last follow-up ranged from 9 to 19, so it is possible that some of them may have subsequently changed their gender identities.

Reiner and Gearhart's research indicates that gender is not arbitrary; it suggests that a biological male (or female) will probably not come to identify as the opposite gender after having been altered physically and immersed into the corresponding gender-typical environment. The plasticity of gender appears to have a limit.

What is clear is that biological sex is not a concept that can be reduced to, or artificially assigned on the basis of, the type of external genitalia

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alone. Surgeons are becoming more capable of constructing artificial genitalia, but these “add-ons” do not change the biological sex of the recipients, who are no more capable of playing the reproductive roles of the opposite biological sex than they were without the surgery. Nor does biological sex change as a function of the environment provided for the child. No degree of supporting a little boy in converting to be considered, by himself and others, to be a little girl makes him biologically a little girl. The scientific definition of biological sex is, for almost all human beings, clear, binary, and stable, reflecting an underlying biological reality that is not contradicted by exceptions to sex-typical behavior, and cannot be altered by surgery or social conditioning.

In a 2004 article summarizing the results of research related to intersex conditions, Paul McHugh, the former chief of psychiatry at Johns Hopkins Hospital (and the coauthor of this report), suggested:

We in the Johns Hopkins Psychiatry Department eventually concluded that human sexual identity is mostly built into our constitution by the genes we inherit and the embryogenesis we undergo. Male hormones sexualize the brain and the mind. Sexual dysphoria—a sense of disquiet in one’s sexual role—naturally occurs amongst those rare males who are raised as females in an effort to correct an infantile genital structural problem.<sup>20</sup>

We now turn our attention to transgender individuals—children and adults—who choose to identify as a gender different from their biological sex, and explore the meaning of gender identity in this context and what the scientific literature tells us about its development.

### Gender Dysphoria

While biological sex is, with very few exceptions, a well-defined, binary trait (male versus female) corresponding to how the body is organized for reproduction, *gender identity* is a more subjective attribute. For most people, their own gender identity is probably not a significant concern; most biological males identify as boys or men, and most biological females identify as girls or women. But some individuals experience an incongruence between their biological sex and their gender identity. If this struggle causes them to seek professional help, then the problem is classified as “gender dysphoria.”

Some male children raised as females, as described in Reiner and colleagues’ 2004 study, came to experience problems with their gender

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identity when their subjective sense of being boys conflicted with being identified and treated as girls by their parents and doctors. The biological sex of the boys was not in question (they had an XY genotype), and the cause of gender dysphoria lay in the fact that they were genetically male, came to identify as male, but had been assigned female gender identities. This suggests that gender identity can be a complex and burdensome issue for those who choose (or have others choose for them) a gender identity opposite their biological sex.

But the cases of gender dysphoria that are the subject of much public debate are those in which individuals come to identify as genders different from those based on their biological sex. These people are usually identified, and describe themselves, as “transgender.”\*

According to the fifth edition of the American Psychiatric Association’s *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*, gender dysphoria is marked by “incongruence between one’s experienced/expressed gender and assigned gender,” as well as “clinically significant distress or impairment in social, occupational, or other important areas of functioning.”<sup>21</sup>

It is important to clarify that gender dysphoria is not the same as gender nonconformity or gender identity disorder. Gender nonconformity describes an individual who behaves in a manner contrary to the gender-specific norms of his or her biological sex. As the *DSM-5* notes, most transvestites, for instance, are not transgender—men who dress as women typically do not identify themselves as women.<sup>22</sup> (However, certain forms of transvestitism can be associated with late-onset gender dysphoria.<sup>23</sup>)

Gender identity disorder, an obsolete term from an earlier version of the *DSM* that was removed in its fifth edition, was used as a psychiatric diagnosis. If we compare the diagnostic criteria for gender dysphoria (the current term) and gender identity disorder (the former term), we see that both require the patient to display “a marked incongruence between one’s

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\* A note on terminology: In this report, we generally use the term *transgender* to refer to persons for whom there is an incongruity between the gender identity they understand themselves to possess and their biological sex. We use the term *transsexual* to refer to individuals who have undergone medical interventions to transform their appearance to better correspond with that of their preferred gender. The most familiar colloquial term used to describe the medical interventions that transform the appearance of transgender individuals may be “sex change” (or, in the case of surgery, “sex-change operation”), but this is not commonly used in the scientific and medical literature today. While no simple terms for these procedures are completely satisfactory, in this report we employ the commonly used terms *sex reassignment* and *sex-reassignment surgery*, except when quoting a source that uses “gender reassignment” or some other term.

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experienced/expressed gender and assigned gender.”<sup>24</sup> The key difference is that a diagnosis of gender dysphoria requires the patient additionally to experience a “clinically significant distress or impairment in social, occupational, or other important areas of functioning” associated with these incongruent feelings.<sup>25</sup> Thus the major set of diagnostic criteria used in contemporary psychiatry does not designate all transgender individuals as having a psychiatric disorder. For example, a biological male who identifies himself as a female is not considered to have a psychiatric disorder unless the individual is experiencing significant psychosocial distress at the incongruence. A diagnosis of gender dysphoria may be part of the criteria used to justify sex-reassignment surgery or other clinical interventions. Furthermore, a patient who has had medical or surgical modifications to express his or her gender identity may still suffer from gender dysphoria. It is the nature of the struggle that defines the disorder, not the fact that the expressed gender differs from the biological sex.

There is no scientific evidence that all transgender people have gender dysphoria, or that they are all struggling with their gender identities. Some individuals who are not transgender—that is, who do not identify as a gender that does not correspond with their biological sex—might nonetheless struggle with their gender identity; for example, girls who behave in some male-typical ways might experience various forms of distress without ever coming to identify as boys. Conversely, individuals who do identify as a gender that does not correspond with their biological sex may not experience clinically significant distress related to their gender identity. Even if only, say, 40% of individuals who identify as a gender that does not correspond with their biological sex experience significant distress related to their gender identity, this would constitute a public health issue requiring clinicians and others to act to support those with gender dysphoria, and hopefully, to reduce the rate of gender dysphoria in the population. There is no evidence to suggest that the other 60% in this hypothetical—that is, the individuals who identify as a gender that does not correspond with their biological sex but who do not experience significant distress—would require clinical treatment.

The *DSM*’s concept of subjectively “experiencing” one’s gender as incongruent from one’s biological sex may require more critical scrutiny and possibly modification. The exact definition of gender dysphoria, however well-intentioned, is somewhat vague and confusing. It does not account for individuals who self-identify as transgender but do not experience dysphoria associated with their gender identity and who seek psychiatric care for functional impairment for problems unrelated to their

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gender identity, such as anxiety or depression. They may then be mislabeled as having gender dysphoria simply because they have a desire to be identified as a member of the opposite gender, when they have come to a satisfactory resolution, subjectively, with this incongruence and may be depressed for reasons having nothing to do with their gender identity.

The *DSM-5* criteria for a diagnosis of gender dysphoria in children are defined in a “more concrete, behavioral manner than those for adolescents and adults.”<sup>26</sup> This is to say that some of the diagnostic criteria for gender dysphoria in children refer to behaviors that are stereotypically associated with the opposite gender. Clinically significant distress is still necessary for a diagnosis of gender dysphoria in children, but some of the other diagnostic criteria include, for instance, a “strong preference for the toys, games, or activities stereotypically used or engaged in by the other gender.”<sup>27</sup> What of girls who are “tomboys” or boys who are not oriented toward violence and guns, who prefer quieter play? Should parents worry that their tomboy daughter is really a boy stuck in a girl’s body? There is no scientific basis for believing that playing with toys typical of boys defines a child as a boy, or that playing with toys typical of girls defines a child as a girl. The *DSM-5* criterion for diagnosing gender dysphoria by reference to gender-typical toys is unsound; it appears to ignore the fact that a child could display an *expressed* gender—manifested by social or behavioral traits—incongruent with the child’s biological sex but without *identifying* as the opposite gender. Furthermore, even for children who do identify as a gender opposite their biological sex, diagnoses of gender dysphoria are simply unreliable. The reality is that they may have psychological difficulties in accepting their biological sex as their gender. Children can have difficulty with the expectations associated with those gender roles. Traumatic experiences can also cause a child to express distress with the gender associated with his or her biological sex.

Gender identity problems can also arise with intersex conditions (the presence of ambiguous genitalia due to genetic abnormalities), which we discussed earlier. These disorders of sex development, while rare, can contribute to gender dysphoria in some cases.<sup>28</sup> Some of these conditions include complete androgen insensitivity syndrome, where individuals with XY (male) chromosomes lack receptors for male sex hormones, leading them to develop the secondary sex characteristics of females, rather than males (though they lack ovaries, do not menstruate, and are consequently sterile).<sup>29</sup> Another hormonal disorder of sex development that can lead to individuals developing in ways that are not typical of their genetic sex include congenital adrenal hyperplasia, a condition that can

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masculinize XX (female) fetuses.<sup>30</sup> Other rare phenomena such as genetic mosaicism<sup>31</sup> or chimerism,<sup>32</sup> where some cells in the individual's bodies contain XX chromosomes and others contain XY chromosomes, can lead to considerable ambiguity in sex characteristics, including individuals who possess both male and female gonads and sex organs.

While there are many cases of gender dysphoria that are not associated with these identifiable intersex conditions, gender dysphoria may still represent a different type of intersex condition in which the primary sex characteristics such as genitalia develop normally while secondary sex characteristics associated with the brain develop along the lines of the opposite sex. Controversy exists over influences determining the nature of neurological, psychological, and behavioral sex differences. The emerging consensus is that there may be some differences in patterns of neurological development in- and ex-utero for men and women.<sup>33</sup> Therefore, in theory, transgender individuals could be subject to conditions allowing a more female-type brain to develop within a genetic male (having the XY chromosomal patterns), and vice versa. However, as we will show in the next section, the research supporting this idea is quite minimal.

As a way of surveying the biological and social science research on gender dysphoria, we can list some of the important questions. Are there biological factors that influence the development of a gender identity that does not correspond with one's biological sex? Are some individuals born with a gender identity different from their biological sex? Is gender identity shaped by environmental or nurturing conditions? How stable are choices of gender identity? How common is gender dysphoria? Is it persistent across the lifespan? Can a little boy who thinks he is a little girl change over the course of his life to regard himself as male? If so, how often can such people change their gender identities? How would someone's gender identity be measured scientifically? Does self-understanding suffice? Does a biological girl become a gender boy by believing, or at least stating, she is a little boy? Do people's struggles with a sense of incongruity between their gender identity and biological sex persist over the life course? Does gender dysphoria respond to psychiatric interventions? Should those interventions focus on affirming the gender identity of the patient or take a more neutral stance? Do efforts to hormonally or surgically modify an individual's primary or secondary sex characteristics help resolve gender dysphoria? Does modification create further psychiatric problems for some of those diagnosed with gender dysphoria, or does it typically resolve existing psychiatric problems? We broach a few of these critical questions in the following sections.

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## Gender and Physiology

Robert Sapolsky, a Stanford professor of biology who has done extensive neuroimaging research, suggested a possible neurobiological explanation for cross-gender identification in a 2013 *Wall Street Journal* article, “Caught Between Male and Female.” He asserted that recent neuroimaging studies of the brains of transgender adults suggest that they may have brain structures more similar to their gender identity than to their biological sex.<sup>34</sup> Sapolsky bases this assertion on the fact that there are differences between male and female brains, and while the differences are “small and variable,” they “probably contribute to the sex differences in learning, emotion and socialization.”<sup>35</sup> He concludes: “The issue isn’t that sometimes people believe they are of a different gender than they actually are. Remarkably, instead, it’s that sometimes people are born with bodies whose gender is different from what they actually are.”<sup>36</sup> In other words, he claims that some people can have a female-type brain in a male body, or vice versa.

While this kind of neurobiological theory of cross-gender identification remains outside of the scientific mainstream, it has recently received scientific and popular attention. It provides a potentially attractive explanation for cross-gender identification, especially for individuals who are not affected by any known genetic, hormonal, or psychosocial abnormalities.<sup>37</sup> However, while Sapolsky may be right, there is fairly little support in the scientific literature for his contention. His neurological explanation for differences between male and female brains and those differences’ possible relevance to cross-gender identification warrant further scientific consideration.

There are many small studies that attempt to define causal factors of the experience of incongruence between one’s biological sex and felt gender. These studies are described in the following pages, each pointing to an influence that may contribute to the explanation for cross-gender identification.

Nancy Segal, a psychologist and geneticist, researched two case studies of identical twins discordant for female-to-male (FtM) transsexualism.<sup>38</sup> Segal notes that, according to another, earlier study that conducted nonclinical interviews with 45 FtM transsexuals, 60% suffered some form of childhood abuse, with 31% experiencing sexual abuse, 29% experiencing emotional abuse, and 38% physical abuse.<sup>39</sup> However, this earlier study did not include a control group and was limited by its small sample size, making it difficult to extract significant interactions, or generalizations, from the data.

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Segal's own first case study was of a 34-year-old FtM twin, whose identical twin sister was married and the mother of seven children.<sup>40</sup> Several stressful events had occurred during the twins' mother's pregnancy, and they were born five weeks prematurely. When they were eight years old, their parents divorced. The FtM twin exhibited gender-nonconforming behavior early and it persisted throughout childhood. She became attracted to other girls in junior high school and as a teenager attempted suicide several times. She reported physical abuse and emotional abuse at the hand of her mother. The twins were raised in a Mormon household, in which transsexuality was not tolerated.<sup>41</sup> The twin sister had never questioned her gender identity but did experience some depression. For Segal, the FtM twin's gender nonconformity and abuse in childhood were factors that contributed to gender dysphoria; the other twin was not subject to the same stressors in childhood, and did not develop issues around her gender identity. Segal's second case study also concerned identical twins with one twin transitioning from female to male.<sup>42</sup> This FtM twin had early-onset nonconforming behaviors and attempted suicide as a young adult. At age 29 she underwent reassignment surgery, was well supported by family, met a woman, and married. As in the first case, the other twin was reportedly always secure in her female gender identity.

Segal speculates that each set of twins may have had uneven prenatal androgen exposures (though her study did not offer evidence to support this)<sup>43</sup> and concludes that "Transsexualism is unlikely to be associated with a major gene, but is likely to be associated with multiple genetic, epigenetic, developmental and experiential influences."<sup>44</sup> Segal is critical of the notion that the maternal abuse experienced by the FtM twin in her first case study may have played a causal role in the twin's "atypical gender identification" since the abuse "apparently *followed*" the twin's gender-atypical behaviors—though Segal acknowledges "it is possible that this abuse reinforced his already atypical gender identification."<sup>45</sup> These case studies, while informative, are not scientifically strong, and do not provide direct evidence for any causal hypotheses about the origins of atypical gender identification.

A source of more information—but also inadequate to make direct causal inferences—is a case analysis by Mayo Clinic psychiatrists J. Michael Bostwick and Kari A. Martin of an intersex individual born with ambiguous genitalia who was operated on and raised as a female.<sup>46</sup> By way of offering some background, the authors draw a distinction between gender identity disorder (an "inconsistency between perceived gender identity and phenotypic sex" that generally involves "no discernible neuroendocri-

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nological abnormality”<sup>47</sup>), and intersexuality (a condition in which biological features of both sexes are present). They also provide a summary and classification scheme of the various types of intersex disorders. After a thorough discussion of the various intersex developmental issues that can lead to a disjunction between the brain and body, the authors acknowledge that “Some adult patients with severe dysphoria—transsexuals—have neither history nor objective findings supporting a known biological cause of brain-body disjunction.”<sup>48</sup> These patients require thorough medical and psychiatric attention to avoid gender dysphoria.

After this helpful summary, the authors state that “Absent psychosis or severe character pathology, patients’ subjective assertions are presently the most reliable standards for delineating core gender identity.”<sup>49</sup> But it is not clear how we could consider subjective assertions more reliable in establishing gender identity, unless gender identity is defined as a completely subjective phenomenon. The bulk of the article is devoted to describing the various objectively discernible and identifiable ways in which one’s identity as a male or female is imprinted on the nervous and endocrine system. Even when something goes wrong with the development of external genitalia, individuals are more likely to act in accordance with their chromosomal and hormonal makeup.<sup>50</sup>

In 2011, Giuseppina Rametti and colleagues from various research centers in Spain used MRI to study the brain structures of 18 FtM transsexuals who exhibited gender nonconformity early in life and experienced sexual attraction to females prior to hormone treatment.<sup>51</sup> The goal was to learn whether their brain features corresponded more to their biological sex or to their sense of gender identity. The control group consisted of 24 male and 19 female heterosexuals with gender identities conforming to their biological sex. Differences were noted in the white matter microstructure of specific brain areas. In untreated FtM transsexuals, that structure was more similar to that of heterosexual males than to that of heterosexual females in three of four brain areas.<sup>52</sup> In a complementary study, Rametti and colleagues compared 18 MtF transsexuals to 19 female and 19 male heterosexual controls.<sup>53</sup> These MtF transsexuals had white matter tract averages in several brain areas that fell between the averages of the control males and the control females. The values, however, were typically closer to the males (that is, to those that shared their biological sex) than to the females in most areas.<sup>54</sup> In controls the authors found that, as expected, the males had greater amounts of gray and white matter and higher volumes of cerebrospinal fluid than control females. The MtF transsexual brain volumes

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were all similar to those of male controls and significantly different from those of females.<sup>55</sup>

Overall, the findings of these studies by Rametti and colleagues do not sufficiently support the notion that transgender individuals have brains more similar to their preferred gender than to the gender corresponding with their biological sex. Both studies are limited by small sample sizes and lack of a prospective hypothesis—both analyzed the MRI data to find the gender differences and then looked to see where the data from transgender subjects fit.

Whereas both of these MRI studies looked at brain *structure*, a functional MRI study by Emiliano Santarnecchi and colleagues from the University of Siena and the University of Florence looked at brain *function*, examining gender-related differences in spontaneous brain activity during the resting state.<sup>56</sup> The researchers compared a single FtM individual (declared cross-gender since childhood), and control groups of 25 males and 25 females, with regard to spontaneous brain activity. The FtM individual demonstrated a “brain activity profile more close to his biological sex than to his desired one,” and based in part on this result the authors concluded that “untreated FtM transsexuals show a functional connectivity profile comparable to female control subjects.”<sup>57</sup> With a sample size of one, this study’s statistical power is virtually zero.

In 2013, Hsaio-Lun Ku and colleagues from various medical centers and research institutes in Taiwan also conducted functional brain imaging studies. They compared the brain activity of 41 transsexuals (21 FtMs, 20 MtFs) and 38 matched heterosexual controls (19 males and 19 females).<sup>58</sup> Arousal response of each cohort while viewing neutral as compared to erotic films was compared between groups. All of the transsexuals in the study reported sexual attractions to members of their natal, biological sex, and exhibited more sexual arousal than heterosexual controls when viewing erotic films that depicted sexual activity between subjects sharing their biological sex. A “selfness” score was also incorporated into the study, in which the researchers asked participants to “rate the degree to which you identify yourself as the male or female in the film.”<sup>59</sup> The transsexuals in the study identified with those of their preferred gender more than the controls identified with those of their biological gender, in both erotic films and neutral films. The heterosexual controls did not identify themselves with either males or females in either of the film types. Ku and colleagues claim to have demonstrated characteristic brain patterns for sexual attraction as related to biological sex but did not make meaningful neurobiological gender-identity comparisons among the three cohorts. In

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addition, they reported findings that transsexuals demonstrated psychosocial maladaptive defensive styles.

A 2008 study by Hans Berglund and colleagues from Sweden's Karolinska Institute and Stockholm Brain Institute used PET and fMRI scans to compare brain-area activation patterns in 12 MtF transgendered individuals who were sexually attracted to women with those of 12 heterosexual women and 12 heterosexual men.<sup>60</sup> The first set of subjects took no hormones and had not undergone sex-reassignment surgery. The experiment involved smelling odorous steroids thought to be female pheromones, and other sexually neutral odors such as lavender oil, cedar oil, eugenol, butanol, and odorless air. The results were varied and mixed between the groups for the various odors, which should not be surprising, since *post hoc* analyses usually lead to contradictory findings.

In summary, the studies presented above show inconclusive evidence and mixed findings regarding the brains of transgender adults. Brain-activation patterns in these studies do not offer sufficient evidence for drawing sound conclusions about possible associations between brain activation and sexual identity or arousal. The results are conflicting and confusing. Since the data by Ku and colleagues on brain-activation patterns are not universally associated with a particular sex, it remains unclear whether and to what extent neurobiological findings say anything meaningful about gender identity. It is important to note that regardless of their findings, studies of this kind cannot support any conclusion that individuals come to identify as a gender that does not correspond to their biological sex because of an innate, biological condition of the brain.

The question is not simply whether there are differences between the brains of transgender individuals and people identifying with the gender corresponding to their biological sex, but whether gender identity is a fixed, innate, and biological trait, even when it does not correspond to biological sex, or whether environmental or psychological causes contribute to the development of a sense of gender identity in such cases. Neurological differences in transgender adults might be the consequence of biological factors such as genes or prenatal hormone exposure, or of psychological and environmental factors such as childhood abuse, or they could result from some combination of the two. There are no serial, longitudinal, or prospective studies looking at the brains of cross-gender identifying children who develop to later identify as transgender adults. Lack of this research severely limits our ability to understand causal relationships between brain morphology, or functional activity, and the later development of gender identity different from biological sex.

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More generally, it is now widely recognized among psychiatrists and neuroscientists who engage in brain imaging research that there are inherent and ineradicable methodological limitations of *any* neuroimaging study that simply associates a particular trait, such as a certain behavior, with a particular brain morphology.<sup>61</sup> (And when the trait in question is not a concrete behavior but something as elusive and vague as “gender identity,” these methodological problems are even more serious.) These studies cannot provide statistical evidence nor show a plausible biological mechanism strong enough to support *causal connections* between a brain feature and the trait, behavior, or symptom in question. To support a conclusion of causality, even epidemiological causality, we need to conduct prospective longitudinal panel studies of a fixed set of individuals across the course of sexual development if not their lifespan.

Studies like these would use serial brain images at birth, in childhood, and at other points along the developmental continuum, to see whether brain morphology findings were there from the beginning. Otherwise, we cannot establish whether certain brain features caused a trait, or whether the trait is innate and perhaps fixed. Studies like those discussed above of individuals who already exhibit the trait are incapable of distinguishing between *causes* and *consequences* of the trait. In most cases transgender individuals have been acting and thinking for years in ways that, through learned behavior and associated neuroplasticity, may have produced brain changes that could differentiate them from other members of their biological or natal sex. The only definitive way to establish epidemiological causality between a brain feature and a trait (especially one as complex as gender identity) is to conduct prospective, longitudinal, preferably randomly sampled and population-based studies.

In the absence of such prospective longitudinal studies, large representative population-based samples with adequate statistical controls for confounding factors may help narrow the possible causes of a behavioral trait and thereby increase the probability of identifying a neurological cause.<sup>62</sup> However, because the studies conducted thus far use small convenience samples, none of them is especially helpful for narrowing down the options for causality. To obtain a better study sample, we would need to include neuroimaging in large-scale epidemiological studies. In fact, given the small number of transgender individuals in the general population,<sup>63</sup> the studies would need to be prohibitively large to attain findings that would reach statistical significance.

Moreover, if a study found significant differences between these groups—that is, a number of differences higher than what would be

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expected by chance alone—these differences would refer to the average in a population of each group. Even if these two *groups* differed significantly for all 100 measurements, it would not necessarily indicate a biological difference among *individuals* at the extremes of the distribution. Thus, a randomly selected transgender individual and a randomly selected non-transgender individual might not differ on any of these 100 measurements. Additionally, since the probability that a randomly selected person from the general population will be transgender is quite small, statistically significant differences in the sample means are not sufficient evidence to conclude that a particular measurement is predictive of whether the person is transgender or not. If we measured the brain of an infant, toddler, or adolescent and found this individual to be closer to one cohort than another on these measures, it would not imply that this individual would grow up to identify as a member of that cohort. It may be helpful to keep this caveat in mind when interpreting research on transgender individuals.

In this context, it is important to note that there are no studies that demonstrate that any of the biological differences being examined have predictive power, and so all interpretations, usually in popular outlets, claiming or suggesting that a statistically significant difference between the brains of people who are transgender and those who are not is the cause of being transgendered or not—that is to say, that the biological differences determine the differences in gender identity—are unwarranted.

In short, the current studies on associations between brain structure and transgender identity are small, methodologically limited, inconclusive, and sometimes contradictory. Even if they were more methodologically reliable, they would be insufficient to demonstrate that brain structure is a cause, rather than an effect, of the gender-identity behavior. They would likewise lack predictive power, the real challenge for any theory in science.

For a simple example to illustrate this point, suppose we had a room with 100 people in it. Two of them are transgender and all others are not. I pick someone at random and ask you to guess the person's gender identity. If you know that 98 out of 100 of the individuals are not transgender, the safest bet would be to guess that the individual is not transgender, since that answer will be correct 98% of the time. Suppose, then, that you have the opportunity to ask questions about the neurobiology and about the natal sex of the person. Knowing the biology only helps in predicting whether the individual is transgender if it can improve on the original guess that the person is not transgender. So if knowing a characteristic of the individual's brain does not improve the ability to predict what group the patient belongs to, then the fact that the two groups differ at the mean is almost irrelevant.

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Improving on the original prediction is very difficult for a rare trait such as being transgender, because the probability of that prediction being correct is already very high. If there really were a clear difference between the brains of transgender and non-transgender individuals, akin to the biological differences between the sexes, then improving on the original guess would be relatively easy. Unlike the differences between the sexes, however, there are no biological features that can reliably identify transgender individuals as different from others.

The consensus of scientific evidence overwhelmingly supports the proposition that a physically and developmentally normal boy or girl is indeed what he or she appears to be at birth. The available evidence from brain imaging and genetics does not demonstrate that the development of gender identity as different from biological sex is innate. Because scientists have not established a solid framework for understanding the causes of cross-gender identification, ongoing research should be open to psychological and social causes, as well as biological ones.

### **Transgender Identity in Children**

In 2012, the *Washington Post* featured a story by Petula Dvorak, “Transgender at five,”<sup>64</sup> about a girl who at the age of 2 years began insisting that she was a boy. The story recounts her mother’s interpretation of this behavior: “Her little girl’s brain was different. Jean [her mother] could tell. She had heard about transgender people, those who are one gender physically but the other gender mentally.” The story recounts this mother’s distressed experiences as she began researching gender identity problems in children and came to understand other parents’ experiences:

Many talked about their painful decision to allow their children to publicly transition to the opposite gender—a much tougher process for boys who wanted to be girls. Some of what Jean heard was reassuring: Parents who took the plunge said their children’s behavior problems largely disappeared, schoolwork improved, happy kid smiles returned. But some of what she heard was scary: children taking puberty blockers in elementary school and teens embarking on hormone therapy before they’d even finished high school.<sup>65</sup>

The story goes on to describe how the sister, Moyin, of the transgender child Tyler (formerly Kathryn) made sense of her sibling’s identity:

Tyler’s sister, who’s 8, was much more casual about describing her transgender sibling. “It’s just a boy mind in a girl body,” Moyin

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explained matter-of-factly to her second-grade classmates at her private school, which will allow Tyler to start kindergarten as a boy, with no mention of Kathryn.<sup>66</sup>

The remarks from the child's sister encapsulate the popular notion regarding gender identity: transgender individuals, or children who meet the diagnostic criteria for gender dysphoria, are simply "a boy mind in a girl body," or vice versa. This view implies that gender identity is a persistent and innate feature of human psychology, and it has inspired a gender-affirming approach to children who experience gender identity issues at an early age.

As we have seen above in the overview of the neurobiological and genetic research on the origins of gender identity, there is little evidence that the phenomenon of transgender identity has a biological basis. There is also little evidence that gender identity issues have a high rate of persistence in children. According to the *DSM-5*, "In natal [biological] males, persistence [of gender dysphoria] has ranged from 2.2% to 30%. In natal females, persistence has ranged from 12% to 50%."<sup>67</sup> Scientific data on persistence of gender dysphoria remains sparse due to the very low prevalence of the disorder in the general population, but the wide range of findings in the literature suggests that there is still much that we do not know about why gender dysphoria persists or desists in children. As the *DSM-5* entry goes on to note, "It is unclear if children 'encouraged' or supported to live socially in the desired gender will show higher rates of persistence, since such children have not yet been followed longitudinally in a systematic manner."<sup>68</sup> There is a clear need for more research in these areas, and for parents and therapists to acknowledge the great uncertainty regarding how to interpret the behavior of these children.

### **Therapeutic Interventions in Children**

With the uncertainty surrounding the diagnosis of and prognosis for gender dysphoria in children, therapeutic decisions are particularly complex and difficult. Therapeutic interventions for children must take into account the probability that the children may outgrow cross-gender identification. University of Toronto researcher and therapist Kenneth Zucker believes that family and peer dynamics can play a significant role in the development and persistence of gender-nonconforming behavior, writing that

it is important to consider both predisposing and perpetuating factors that might inform a clinical formulation and the development of

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a therapeutic plan: the role of temperament, parental reinforcement of cross-gender behavior during the sensitive period of gender identity formation, family dynamics, parental psychopathology, peer relationships and the multiple meanings that might underlie the child's fantasy of becoming a member of the opposite sex.<sup>69</sup>

Zucker worked for years with children experiencing feelings of gender incongruence, offering psychosocial treatments to help them embrace the gender corresponding with their biological sex—for instance, talk therapy, parent-arranged play dates with same-sex peers, therapy for co-occurring psychopathological issues such as autism spectrum disorder, and parent counseling.<sup>70</sup>

In a follow-up study by Zucker and colleagues of children treated by them over the course of thirty years at the Center for Mental Health and Addiction in Toronto, they found that gender identity disorder persisted in only 3 of the 25 girls they had treated.<sup>71</sup> (Zucker's clinic was closed by the Canadian government in 2015.<sup>72</sup>)

An alternative to Zucker's approach that emphasizes affirming the child's preferred gender identity has become more common among therapists.<sup>73</sup> This approach involves helping the children to self-identify even more with the gender label they prefer at the time. One component of the gender-affirming approach has been the use of hormone treatments for adolescents in order to delay the onset of sex-typical characteristics during puberty and alleviate the feelings of dysphoria the adolescents will experience as their bodies develop sex-typical characteristics that are at odds with the gender with which they identify. There is relatively little evidence for the therapeutic value of these kinds of puberty-delaying treatments, but they are currently the subject of a large clinical study sponsored by the National Institutes of Health.<sup>74</sup>

While epidemiological data on the outcomes of medically delayed puberty is quite limited, referrals for sex-reassignment hormones and surgical procedures appear to be on the rise, and there is a push among many advocates to proceed with sex reassignment at younger ages. According to a 2013 article in *The Times* of London, the United Kingdom saw a 50% increase in the number of children referred to gender dysphoria clinics from 2011 to 2012, and a nearly 50% increase in referrals among adults from 2010 to 2012.<sup>75</sup> Whether this increase can be attributed to rising rates of gender confusion, rising sensitivity to gender issues, growing acceptance of therapy as an option, or other factors, the increase itself is concerning, and merits further scientific inquiry into the family dynamics

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and other potential problems, such as social rejection or developmental issues, that may be taken as signs of childhood gender dysphoria.

A study of psychological outcomes following puberty suppression and sex-reassignment surgery, published in the journal *Pediatrics* in 2014 by child and adolescent psychiatrist Annelou L. C. de Vries and colleagues, suggested improved outcomes for individuals after receiving these interventions, with well-being improving to a level similar to that of young adults from the general population.<sup>76</sup> This study looked at 55 transgender adolescents and young adults (22 MtF and 33 FtM) from a Dutch clinic who were assessed three times: before the start of puberty suppression (mean age: 13.6 years), when cross-sex hormones were introduced (mean age: 16.7 years), and at least one year after sex-reassignment surgery (mean age: 20.7 years). The study did not provide a matched group for comparison—that is, a group of transgender adolescents who did not receive puberty-blocking hormones, cross-sex hormones, and/or sex-reassignment surgery—which makes comparisons of outcomes more difficult.

In the study cohort, gender dysphoria improved over time, body image improved on some measures, and overall functioning improved modestly. Due to the lack of a matched control group it is unclear whether these changes are attributable to the procedures or would have occurred in this cohort without the medical and surgical interventions. Measures of anxiety, depression, and anger showed some improvements over time, but these findings did not reach statistical significance. While this study suggested some improvements over time in this cohort, particularly the reported subjective satisfaction with the procedures, detecting significant differences would require the study to be replicated with a matched control group and a larger sample size. The interventions also included care from a multidisciplinary team of medical professionals, which could have had a beneficial effect. Future studies of this kind would ideally include long-term follow-ups that assess outcomes and functioning beyond the late teens or early twenties.

### **Therapeutic Interventions in Adults**

The potential that patients undergoing medical and surgical sex reassignment may want to return to a gender identity consistent with their biological sex suggests that reassignment carries considerable psychological and physical risk, especially when performed in childhood, but also in adulthood. It suggests that the patients' pre-treatment beliefs about an ideal post-treatment life may sometimes go unrealized.

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In 2004, Birmingham University's Aggressive Research Intelligence Facility (Arif) assessed the findings of more than one hundred follow-up studies of post-operative transsexuals.<sup>77</sup> An article in *The Guardian* summarized the findings:

Arif...concludes that none of the studies provides conclusive evidence that gender reassignment is beneficial for patients. It found that most research was poorly designed, which skewed the results in favour of physically changing sex. There was no evaluation of whether other treatments, such as long-term counselling, might help transsexuals, or whether their gender confusion might lessen over time. Arif says the findings of the few studies that have tracked significant numbers of patients over several years were flawed because the researchers lost track of at least half of the participants. The potential complications of hormones and genital surgery, which include deep vein thrombosis and incontinence respectively, have not been thoroughly investigated, either. "There is huge uncertainty over whether changing someone's sex is a good or a bad thing," says Dr Chris Hyde, director of Arif. "While no doubt great care is taken to ensure that appropriate patients undergo gender reassignment, there's still a large number of people who have the surgery but remain traumatized—often to the point of committing suicide."<sup>78</sup>

The high level of uncertainty regarding various outcomes after sex-reassignment surgery makes it difficult to find clear answers about the effects on patients of reassignment surgery. Since 2004, there have been other studies on the efficacy of sex-reassignment surgery, using larger sample sizes and better methodologies. We will now examine some of the more informative and reliable studies on outcomes for individuals receiving sex-reassignment surgery.

As far back as 1979, Jon K. Meyer and Donna J. Reter published a longitudinal follow-up study on the overall well-being of adults who underwent sex-reassignment surgery.<sup>79</sup> The study compared the outcomes of 15 people who received surgery with those of 35 people who requested but did not receive surgery (14 of these individuals eventually received surgery later, resulting in three cohorts of comparison: operated, not-operated, and operated later). Well-being was quantified using a scoring system that assessed psychiatric, economic, legal, and relationship outcome variables. Scores were determined by the researchers after performing interviews with the subjects. Average follow-up time was approximately five years for subjects who had sex change surgery, and about two years for those subjects who did not.

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Compared to their condition before surgery, the individuals who had undergone surgery appeared to show some improvement in well-being, though the results had a fairly low level of statistical significance. Individuals who had no surgical intervention did display a statistically significant improvement at follow-up. However, there was no statistically significant difference between the two groups' scores of well-being at follow-up. The authors concluded that "sex reassignment surgery confers no objective advantage in terms of social rehabilitation, although it remains subjectively satisfying to those who have rigorously pursued a trial period and who have undergone it."<sup>80</sup> This study led the psychiatry department at Johns Hopkins Medical Center (JHMC) to discontinue surgical interventions for sex changes for adults.<sup>81</sup>

However, the study has important limitations. Selection bias was introduced in the study population, because the subjects were drawn from those individuals who sought sex-reassignment surgery at JHMC. In addition, the sample size was small. Also, the individuals who did not undergo sex-reassignment surgery but presented to JHMC for it did not represent a true control group. Random assignment of the surgical procedure was not possible. Large differences in the average follow-up time between those who underwent surgery and those who did not further reduces any capacity to draw valid comparisons between the two groups. Additionally, the study's methodology was also criticized for the somewhat arbitrary and idiosyncratic way it measured the well-being of its subjects. Cohabitation or any form of contact with psychiatric services were scored as equally negative factors as having been arrested.<sup>82</sup>

In 2011, Cecilia Dhejne and colleagues from the Karolinska Institute and Gothenburg University in Sweden published one of the more robust and well-designed studies to examine outcomes for persons who underwent sex-reassignment surgery. Focusing on mortality, morbidity, and criminality rates, the matched cohort study compared a total of 324 transsexual persons (191 MtFs, 133 FtMs) who underwent sex reassignment between 1973 and 2003 to two age-matched controls: people of the same sex as the transsexual person at birth, and people of the sex to which the individual had been reassigned.<sup>83</sup>

Given the relatively low number of transsexual persons in the general population, the size of this study is impressive. Unlike Meyer and Reter, Dhejne and colleagues did not seek to evaluate the patient satisfaction after sex-reassignment surgery, which would have required a control group of transgender persons who desired to have sex-reassignment surgery but did not receive it. Also, the study did not compare outcome

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variables before and after sex-reassignment surgery; only outcomes after surgery were evaluated. We need to keep these caveats in mind as we look at what this study found.

Dhejne and colleagues found statistically significant differences between the two cohorts on several of the studied rates. For example, the postoperative transsexual individuals had an approximately three times higher risk for psychiatric hospitalization than the control groups, even after adjusting for prior psychiatric treatment.<sup>84</sup> (However, the risk of being hospitalized for substance abuse was not significantly higher after adjusting for prior psychiatric treatment, as well as other covariates.) Sex-reassigned individuals had nearly a three times higher risk of all-cause mortality after adjusting for covariates, although the elevated risk was significant only for the time period of 1973–1988.<sup>85</sup> Those undergoing surgery during this period were also at increased risk of being convicted of a crime.<sup>86</sup> Most alarmingly, sex-reassigned individuals were 4.9 times more likely to attempt suicide and 19.1 times more likely to die by suicide compared to controls.<sup>87</sup> “Mortality from suicide was strikingly high among sex-reassigned persons, including after adjustment for prior psychiatric morbidity.”<sup>88</sup>

The study design precludes drawing inferences “as to the effectiveness of sex reassignment as a treatment for transsexualism,” although Dhejne and colleagues state that it is possible that “things might have been even worse without sex reassignment.”<sup>89</sup> Overall, post-surgical mental health was quite poor, as indicated especially by the high rate of suicide attempts and all-cause mortality in the 1973–1988 group. (It is worth noting that for the transsexuals in the study who underwent sex reassignment from 1989 to 2003, there were of course fewer years of data available at the time the study was conducted than for those transsexuals from the earlier period. The rates of mortality, morbidity, and criminality in the later group may in time come to resemble the elevated risks of the earlier group.) In summary, this study suggests that sex-reassignment surgery may not rectify the comparatively poor health outcomes associated with transgender populations in general. Still, because of the limitations of this study mentioned above, the results also cannot establish that sex-reassignment surgery causes poor health outcomes.

In 2009, Annette Kuhn and colleagues from the University Hospital and University of Bern in Switzerland examined post-surgery quality of life in 52 MtF and 3 FtM transsexuals fifteen years after sex-reassignment surgery.<sup>90</sup> This study found considerably lower general life satisfaction in post-surgical transsexuals as compared with females who had at least one

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pelvic surgery in the past. The postoperative transsexuals reported lower satisfaction with their general quality of health and with some of the personal, physical, and social limitations they experienced with incontinence that resulted as a side effect of the surgery. Again, inferences cannot be drawn from this study regarding the efficacy of sex-reassignment surgery due to the lack of a control group of transgender individuals who did not receive sex-reassignment surgery.

In 2010, Mohammad Hassan Murad and colleagues from the Mayo Clinic published a systematic review of studies on the outcomes of hormonal therapies used in sex-reassignment procedures, finding that there was “very low quality evidence” that sex reassignment via hormonal interventions “likely improves gender dysphoria, psychological functioning and comorbidities, sexual function and overall quality of life.”<sup>91</sup> The authors identified 28 studies that together examined 1,833 patients who underwent sex-reassignment procedures that included hormonal interventions (1,093 male-to-female, 801 female-to-male).<sup>92</sup> Pooling data across studies showed that, after receiving sex-reassignment procedures, 80% of patients reported improvement in gender dysphoria, 78% reported improvement in psychological symptoms, and 80% reported improvement in quality of life.<sup>93</sup> None of the studies included the bias-limiting measure of randomization (that is, in none of the studies were sex-reassignment procedures assigned randomly to some patients but not to others), and only three of the studies included control groups (that is, patients who were not provided the treatment to serve as comparison cases for those who did).<sup>94</sup> Most of the studies examined in Murad and colleagues’ review reported improvements in psychiatric comorbidities and quality of life, though notably suicide rates remained higher for individuals who had received hormone treatments than for the general population, despite reductions in suicide rates following the treatments.<sup>95</sup> The authors also found that there were some exceptions to reports of improvements in mental health and satisfaction with sex-reassignment procedures; in one study, 3 of 17 individuals regretted the procedure with 2 of these 3 seeking reversal procedures,<sup>96</sup> and four of the studies reviewed reported worsening quality of life, including continuing social isolation, lack of improvement in social relationships, and dependence on government welfare programs.<sup>97</sup>

The scientific evidence summarized suggests we take a skeptical view toward the claim that sex-reassignment procedures provide the hoped-for benefits or resolve the underlying issues that contribute to elevated mental health risks among the transgender population. While we work to stop maltreatment and misunderstanding, we should also work to study

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and understand whatever factors may contribute to the high rates of suicide and other psychological and behavioral health problems among the transgender population, and to think more clearly about the treatment options that are available.

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## Conclusion

Accurate, replicable scientific research results can and do influence our personal decisions and self-understanding, and can contribute to the public discourse, including cultural and political debates. When the research touches on controversial themes, it is particularly important to be clear about precisely what science has and has not shown. For complex, complicated questions concerning the nature of human sexuality, there exists at best provisional scientific consensus; much remains unknown, as sexuality is an immensely complex part of human life that defies our attempts at defining all its aspects and studying them with precision.

For questions that are easier to study empirically, however, such as those concerning the rates of mental health outcomes for identifiable subpopulations of sexual minorities, the research does offer some clear answers: these subpopulations show higher rates of depression, anxiety, substance abuse, and suicide compared to the general population. One hypothesis, the social stress model—which posits that stigma, prejudice, and discrimination are the primary causes of higher rates of poor mental health outcomes for these subpopulations—is frequently cited as a way to explain this disparity. While non-heterosexual and transgender individuals are often subject to social stressors and discrimination, science has not shown that these factors alone account for the entirety, or even a majority, of the health disparity between non-heterosexual and transgender subpopulations and the general population. There is a need for extensive research in this area to test the social stress hypothesis and other potential explanations for the health disparities, and to help identify ways of addressing the health concerns present in these subpopulations.

Some of the most widely held views about sexual orientation, such as the “born that way” hypothesis, simply are not supported by science. The literature in this area does describe a small ensemble of biological differences between non-heterosexuals and heterosexuals, but those biological differences are not sufficient to predict sexual orientation, the ultimate test of any scientific finding. The strongest statement that science offers to explain sexual orientation is that some biological factors appear, to an unknown extent, to predispose some individuals to a non-heterosexual orientation.

The suggestion that we are “born that way” is more complex in the case of gender identity. In one sense, the evidence that we are born with

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## CONCLUSION

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a given gender seems well supported by direct observation: males overwhelmingly identify as men and females as women. The fact that children are (with a few exceptions of intersex individuals) born either biologically male or female is beyond debate. The biological sexes play complementary roles in reproduction, and there are a number of population-level average physiological and psychological differences between the sexes. However, while biological sex is an innate feature of human beings, gender identity is a more elusive concept.

In reviewing the scientific literature, we find that almost nothing is well understood when we seek biological explanations for what causes some individuals to state that their gender does not match their biological sex. The findings that do exist often have sample-selection problems, and they lack longitudinal perspective and explanatory power. Better research is needed, both to identify ways by which we can help to lower the rates of poor mental health outcomes and to make possible more informed discussion about some of the nuances present in this field.

Yet despite the scientific uncertainty, drastic interventions are prescribed and delivered to patients identifying, or identified, as transgender. This is especially troubling when the patients receiving these interventions are children. We read popular reports about plans for medical and surgical interventions for many prepubescent children, some as young as six, and other therapeutic approaches undertaken for children as young as two. We suggest that no one can determine the gender identity of a two-year-old. We have reservations about how well scientists understand what it even means for a child to have a developed sense of his or her gender, but notwithstanding that issue, we are deeply alarmed that these therapies, treatments, and surgeries seem disproportionate to the severity of the distress being experienced by these young people, and are at any rate premature since the majority of children who identify as the gender opposite their biological sex will not continue to do so as adults. Moreover, there is a lack of reliable studies on the long-term effects of these interventions. We strongly urge caution in this regard.

We have sought in this report to present a complex body of research in a way that will be intelligible to a wide audience of both experts and lay readers alike. Everyone—scientists and physicians, parents and teachers, lawmakers and activists—deserves access to accurate information about sexual orientation and gender identity. While there is much controversy surrounding how our society treats its LGBT members, no political

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or cultural views should discourage us from understanding the related clinical and public health issues and helping people suffering from mental health problems that may be connected to their sexuality.

Our work suggests some avenues for future research in the biological, psychological, and social sciences. More research is needed to uncover the causes of the increased rates of mental health problems in the LGBT subpopulations. The social stress model that dominates research on this issue requires improvement, and most likely needs to be supplemented by other hypotheses. Additionally, the ways in which sexual desires develop and change across one's lifespan remain, for the most part, inadequately understood. Empirical research may help us to better understand relationships, sexual health, and mental health.

Critiquing and challenging both parts of the “born that way” paradigm—both the notion that sexual orientation is biologically determined and fixed, and the related notion that there is a fixed gender independent of biological sex—enables us to ask important questions about sexuality, sexual behaviors, gender, and individual and social goods in a different light. Some of these questions lie outside the scope of this work, but those that we have examined suggest that there is a great chasm between much of the public discourse and what science has shown.

Thoughtful scientific research and careful, circumspect interpretation of its results can advance our understanding of sexual orientation and gender identity. There is still much work to be done and many unanswered questions. We have attempted to synthesize and describe a complex body of scientific research related to some of these themes. We hope that this report contributes to the ongoing public conversation regarding human sexuality and identity. We anticipate that this report may elicit spirited responses, and we welcome them.

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## Notes

### Part One: Sexual Orientation

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124. Laumann *et al.*, *The Social Organization of Sexuality*, 295.

125. The third iteration of Natsal from 2010 found, over an age range from 16 to 74, that 1.0% of women and 1.5% of men consider themselves gay/lesbian, and 1.4% of women and 1.0% of men think of themselves as bisexual. See Catherine H. Mercer *et al.*, “Changes in sexual attitudes and lifestyles in Britain through the life course and over time: findings from the National Surveys of Sexual Attitudes and Lifestyles (Natsal),” *The Lancet* 382, no. 9907 (2013): 1781–1794, [http://dx.doi.org/10.1016/S0140-6736\(13\)62035-8](http://dx.doi.org/10.1016/S0140-6736(13)62035-8). Full results of this survey are reported in several articles in the same issue of *The Lancet*.

126. See Table 8.1 in Laumann *et al.*, *The Social Organization of Sexuality*, 304.

127. This figure is calculated from Table 8.2 in Laumann *et al.*, *The Social Organization of Sexuality*, 305.

128. For more information on the study design of Add Health, see Kathleen Mullan Harris *et al.*, “Study Design,” The National Longitudinal Study of Adolescent to Adult Health, <http://www.cpc.unc.edu/projects/addhealth/design>. Some studies based on Add Health data use Arabic numerals rather than Roman numerals to label the waves; when describing or quoting from those studies, we stick with the Roman numerals.

129. See Table 1 in Ritch C. Savin-Williams and Kara Joyner, “The Dubious Assessment of Gay, Lesbian, and Bisexual Adolescents of Add Health,” *Archives of Sexual Behavior* 43, no. 3 (2014): 413–422, <http://dx.doi.org/10.1007/s10508-013-0219-5>.

130. *Ibid.*, 415.

131. *Ibid.*

132. *Ibid.*

133. “Research Collaborators,” The National Longitudinal Study of Adolescent to Adult Health, <http://www.cpc.unc.edu/projects/addhealth/people>.

134. J. Richard Udry and Kim Chantala, “Risk Factors Differ According to Same-Sex and Opposite-Sex Interest,” *Journal of Biosocial Science* 37, no. 04 (2005): 481–497, <http://dx.doi.org/10.1017/S0021932004006765>.

135. Ritch C. Savin-Williams and Geoffrey L. Ream, “Prevalence and Stability of Sexual Orientation Components During Adolescence and Young Adulthood,” *Archives of Sexual Behavior* 36, no. 3 (2007): 385–394, <http://dx.doi.org/10.1007/s10508-006-9088-5>.

136. *Ibid.*, 388.

137. *Ibid.*, 389.

138. *Ibid.*, 392–393.

139. *Ibid.*, 393.

140. Miles Q. Ott *et al.*, “Repeated Changes in Reported Sexual Orientation Identity Linked to Substance Use Behaviors in Youth,” *Journal of Adolescent Health* 52, no. 4 (2013): 465–472, <http://dx.doi.org/10.1016/j.jadohealth.2012.08.004>.

141. Savin-Williams and Joyner, “The Dubious Assessment of Gay, Lesbian, and Bisexual

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Adolescents of Add Health.”

142. *Ibid.*, 416.

143. *Ibid.*, 414.

144. For more analysis of inaccurate responders in the Add Health surveys, see Xitao Fan *et al.*, “An Exploratory Study about Inaccuracy and Invalidity in Adolescent Self-Report Surveys,” *Field Methods* 18, no. 3 (2006): 223–244, <http://dx.doi.org/10.1177/152822X06289161>.

145. Savin-Williams and Joyner were also skeptical of the Add Health survey data because the high proportion of youth reporting same-sex or both-sex attractions (7.3% of boys and 5.0% of girls) in Wave I was very unusual when compared to similar studies, and because of the dramatic reduction in reported same-sex attraction a little over a year later, in Wave II.

146. Savin-Williams and Joyner, “The Dubious Assessment of Gay, Lesbian, and Bisexual Adolescents of Add Health,” 420.

147. Gu Li, Sabra L. Katz-Wise, and Jerel P. Calzo, “The Unjustified Doubt of Add Health Studies on the Health Disparities of Non-Heterosexual Adolescents: Comment on Savin-Williams and Joyner (2014),” *Archives of Sexual Behavior*, 43 no. 6 (2014): 1023–1026, <http://dx.doi.org/10.1007/s10508-014-0313-3>.

148. *Ibid.*, 1024.

149. *Ibid.*, 1025.

150. Ritch C. Savin-Williams and Kara Joyner, “The Politicization of Gay Youth Health: Response to Li, Katz-Wise, and Calzo (2014),” *Archives of Sexual Behavior* 43, no. 6 (2014): 1027–1030, <http://dx.doi.org/10.1007/s10508-014-0359-2>.

151. See, for example, Stephen T. Russell *et al.*, “Being Out at School: The Implications for School Victimization and Young Adult Adjustment,” *American Journal of Orthopsychiatry* 84, no. 6 (2014): 635–643, <http://dx.doi.org/10.1037/ort0000037>.

152. Sabra L. Katz-Wise *et al.*, “Same Data, Different Perspectives: What Is at Stake? Response to Savin-Williams and Joyner (2014a),” *Archives of Sexual Behavior* 44, no. 1 (2015): 15, <http://dx.doi.org/10.1007/s10508-014-0434-8>.

153. *Ibid.*, 15.

154. *Ibid.*, 15–16.

155. For example, see Bailey, “What is Sexual Orientation and Do Women Have One?,” 43–63; Peplau *et al.*, “The Development of Sexual Orientation in Women,” 70–99.

156. Lisa M. Diamond, *Sexual Fluidity* (Cambridge, Mass.: Harvard University Press, 2008), 52.

157. Lisa M. Diamond, “Was It a Phase? Young Women’s Relinquishment of Lesbian/Bisexual Identities Over a 5-Year Period,” *Journal of Personality and Social Psychology* 84, no. 2 (2003): 352–364, <http://dx.doi.org/10.1037/0022-3514.84.2.352>.

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158. Diamond, “What Does Sexual Orientation Orient?,” 173–192.

159. This conference paper was summarized in Denizet-Lewis, “The Scientific Quest to Prove Bisexuality Exists.”

160. A. Lee Beckstead, “Can We Change Sexual Orientation?,” *Archives of Sexual Behavior* 41, no. 1 (2012): 128, <http://dx.doi.org/10.1007/s10508-012-9922-x>.

## Part Two: Sexuality, Mental Health Outcomes, and Social Stress

1. Michael King *et al.*, “A systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people,” *BMC Psychiatry* 8 (2008): 70, <http://dx.doi.org/10.1186/1471-244X-8-70>.

2. The researchers who performed this meta-analysis initially found 13,706 papers by searching academic and medical research databases, but after excluding duplicates and other spurious search results examined 476 papers. After further excluding uncontrolled studies, qualitative papers, reviews, and commentaries, the authors found 111 data-based papers, of which they excluded 87 that were not population-based studies, or that failed to employ psychiatric diagnoses, or that used poor sampling. The 28 remaining papers relied on 25 studies (some of the papers examined data from the same studies), which King and colleagues evaluated using four quality criteria: (1) whether or not random sampling was used; (2) the representativeness of the study (measured by survey response rates); (3) whether the sample was drawn from the general population or from some more limited subset, such as university students; and (4) sample size. However, only one study met all four criteria. Acknowledging the inherent limitations and inconsistencies of sexual orientation concepts, the authors included information on how those concepts were operationalized in the studies analyzed—whether in terms of same-sex attraction (four studies), same-sex behavior (thirteen studies), self-identification (fifteen studies), score above zero on the Kinsey scale (three studies), two different definitions of sexual orientation (nine studies), three different definitions (one study). Eighteen of the studies used a specific time frame for defining the sexuality of their subjects. The studies were also grouped into whether or not they focused on lifetime or twelve-month prevalence, and whether the authors analyzed outcomes for LGB populations separately or collectively.

3. 95% confidence interval: 1.87–3.28.

4. 95% confidence interval: 1.69–2.48.

5. 95% confidence interval: 1.23–1.92.

6. 95% confidence interval: 1.23–1.86.

7. 95% confidence interval: 1.97–5.92.

8. 95% confidence interval: 2.32–7.88.

9. Wendy B. Bostwick *et al.*, “Dimensions of Sexual Orientation and the Prevalence of Mood and Anxiety Disorders in the United States,” *American Journal of Public Health* 100, no. 3 (2010): 468–475, <http://dx.doi.org/10.2105/AJPH.2008.152942>.

10. *Ibid.*, 470.

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11. The difference in health outcomes between women who identify as lesbians and women who report exclusive same-sex sexual behaviors or attractions is a good illustration of how the differences between sexual identity, behavior, and attraction matter.

12. Susan D. Cochran and Vickie M. Mays, “Physical Health Complaints Among Lesbians, Gay Men, and Bisexual and Homosexually Experienced Heterosexual Individuals: Results From the California Quality of Life Survey,” *American Journal of Public Health* 97, no. 11 (2007): 2048–2055, <http://dx.doi.org/10.2105/AJPH.2006.087254>.

13. Christine E. Grella *et al.*, “Influence of gender, sexual orientation, and need on treatment utilization for substance use and mental disorders: Findings from the California Quality of Life Survey,” *BMC Psychiatry* 9, no. 1 (2009): 52, <http://dx.doi.org/10.1186/1471-244X-9-52>.

14. Theo G. M. Sandfort *et al.*, “Sexual Orientation and Mental and Physical Health Status: Findings from a Dutch Population Survey,” *American Journal of Public Health* 96, (2006): 1119–1125, <http://dx.doi.org/10.2105/AJPH.2004.058891>.

15. Robert Graham *et al.*, Committee on Lesbian, Gay, Bisexual, and Transgender Health Issues and Research Gaps and Opportunities, Institute of Medicine, *The Health of Lesbian, Gay, Bisexual, and Transgender People: Building a Foundation for Better Understanding* (Washington, D.C.: The National Academies Press, 2011), <http://dx.doi.org/10.17226/13128>.

16. Susan D. Cochran, J. Greer Sullivan, and Vickie M. Mays, “Prevalence of Mental Disorders, Psychological Distress, and Mental Health Services Use Among Lesbian, Gay, and Bisexual Adults in the United States,” *Journal of Consulting and Clinical Psychology* 71, no. 1 (2007): 53–61, <http://dx.doi.org/10.1037/0022-006X.71.1.53>.

17. Lisa A. Razzano, Alicia Matthews, and Tonda L. Hughes, “Utilization of Mental Health Services: A Comparison of Lesbian and Heterosexual Women,” *Journal of Gay & Lesbian Social Services* 14, no. 1 (2002): 51–66, [http://dx.doi.org/10.1300/J041v14n01\\_03](http://dx.doi.org/10.1300/J041v14n01_03).

18. Robert Graham *et al.*, *The Health of Lesbian, Gay, Bisexual, and Transgender People*, 4.

19. *Ibid.*, 190, see also 258–259.

20. *Ibid.*, 211.

21. Esther D. Rothblum and Rhonda Factor, “Lesbians and Their Sisters as a Control Group: Demographic and Mental Health Factors,” *Psychological Science* 12, no. 1 (2001): 63–69, <http://dx.doi.org/10.1111/1467-9280.00311>.

22. Stephen M. Horowitz, David L. Weis, and Molly T. Laflin, “Bisexuality, Quality of Life, Lifestyle, and Health Indicators,” *Journal of Bisexuality* 3, no. 2 (2003): 5–28, [http://dx.doi.org/10.1300/J159v03n02\\_02](http://dx.doi.org/10.1300/J159v03n02_02).

23. By way of context, it may be worth noting that in the United States, the overall suicide rate has risen in recent years: “From 1999 through 2014, the age-adjusted suicide rate in the United States increased 24%, from 10.5 to 13.0 per 100,000 population, with the pace of increase greater after 2006.” Sally C. Curtin, Margaret Warner, and Holly Hedegaard, “Increase in suicide in the United States, 1999–2014,” National Center for

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Health Statistics, NCHS data brief no. 241 (April 22, 2016), <http://www.cdc.gov/nchs/products/databriefs/db241.htm>.

24. Ann P. Haas *et al.*, “Suicide and Suicide Risk in Lesbian, Gay, Bisexual, and Transgender Populations: Review and Recommendations,” *Journal of Homosexuality* 58, no. 1 (2010): 10–51, <http://dx.doi.org/10.1080/00918369.2011.534038>.

25. *Ibid.*, 13.

26. David M. Fergusson, L. John Horwood, and Annette L. Beautrais, “Is Sexual Orientation Related to Mental Health Problems and Suicidality in Young People?,” *Archives of General Psychiatry* 56, no. 10 (1999): 876–880, <http://dx.doi.org/10.1001/archpsyc.56.10.876>.

27. Paul J. M. Van Kesteren *et al.*, “Mortality and morbidity in transsexual subjects treated with cross-sex hormones,” *Clinical Endocrinology* 47, no. 3 (1997): 337–343, <http://dx.doi.org/10.1046/j.1365-2265.1997.2601068.x>.

28. Friedemann Pfäfflin and Astrid Junge, *Sex Reassignment: Thirty Years of International Follow-Up Studies After Sex Reassignment Surgery: A Comprehensive Review, 1961–1991*, Roberta B. Jacobson and Alf B. Meier, trans. (Düsseldorf: Symposion Publishing, 1998), <https://web.archive.org/web/20070503090247/http://www.symposion.com/ijt/pfaefflin/1000.htm>.

29. Jean M. Dixen *et al.*, “Psychosocial characteristics of applicants evaluated for surgical gender reassignment,” *Archives of Sexual Behavior* 13, no. 3 (1984): 269–276, <http://dx.doi.org/10.1007/BF01541653>.

30. Robin M. Mathy, “Transgender Identity and Suicidality in a Nonclinical Sample: Sexual Orientation, Psychiatric History, and Compulsive Behaviors,” *Journal of Psychology & Human Sexuality* 14, no. 4 (2003): 47–65, [http://dx.doi.org/10.1300/J056v14n04\\_03](http://dx.doi.org/10.1300/J056v14n04_03).

31. Yue Zhao *et al.*, “Suicidal Ideation and Attempt Among Adolescents Reporting ‘Unsure’ Sexual Identity or Heterosexual Identity Plus Same-Sex Attraction or Behavior: Forgotten Groups?,” *Journal of the American Academy of Child & Adolescent Psychiatry* 49, no. 2 (2010): 104–113, <http://dx.doi.org/10.1016/j.jaac.2009.11.003>.

32. Wendy B. Bostwick *et al.*, “Dimensions of Sexual Orientation and the Prevalence of Mood and Anxiety Disorders in the United States.”

33. Martin Plöderl *et al.*, “Suicide Risk and Sexual Orientation: A Critical Review,” *Archives of Sexual Behavior* 42, no. 5 (2013): 715–727, <http://dx.doi.org/10.1007/s10508-012-0056-y>.

34. Ritch C. Savin-Williams, “Suicide Attempts Among Sexual-Minority Youths: Population and Measurement Issues,” *Journal of Consulting and Clinical Psychology* 69, no. 6 (2001): 983–991, <http://dx.doi.org/10.1037/0022-006X.69.6.983>.

35. For females in this study, eliminating false positive attempts substantially decreased the difference between orientations. For males, the “true suicide attempts” difference approached statistical significance: 2% of heterosexual males (1 of 61) and 9% of homosexual males (5 of 53) attempted suicide, resulting in an odds ratio of 6.2.

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36. Martin Plöderl *et al.*, “Suicide Risk and Sexual Orientation,” 716–717.
37. *Ibid.*, 723.
38. *Ibid.*
39. Richard Herrell *et al.*, “Sexual Orientation and Suicidality: A Co-twin Control Study in Adult Men,” *Archives of General Psychiatry* 56, no. 10 (1999): 867–874, <http://dx.doi.org/10.1001/archpsyc.56.10.867>.
40. *Ibid.*, 872.
41. Robin M. Mathy *et al.*, “The association between relationship markers of sexual orientation and suicide: Denmark, 1990–2001,” *Social Psychiatry and Psychiatric Epidemiology* 46, no. 2 (2011): 111–117, <http://dx.doi.org/10.1007/s00127-009-0177-3>.
42. Gary Remafedi, James A. Farrow, and Robert W. Deisher, “Risk Factors for Attempted Suicide in Gay and Bisexual Youth,” *Pediatrics* 87, no. 6 (1991): 869–875, <http://pediatrics.aappublications.org/content/87/6/869>.
43. *Ibid.*, 873.
44. Gary Remafedi, “Adolescent Homosexuality: Psychosocial and Medical Implications,” *Pediatrics* 79, no. 3 (1987): 331–337, <http://pediatrics.aappublications.org/content/79/3/331>.
45. Martin Plöderl, Karl Kralovec, and Reinhold Fartacek, “The Relation Between Sexual Orientation and Suicide Attempts in Austria,” *Archives of Sexual Behavior* 39, no. 6 (2010): 1403–1414, <http://dx.doi.org/10.1007/s10508-009-9597-0>.
46. Travis Salway Hottes *et al.*, “Lifetime Prevalence of Suicide Attempts Among Sexual Minority Adults by Study Sampling Strategies: A Systematic Review and Meta-Analysis,” *American Journal of Public Health* 106, no. 5 (2016): e1–e12, <http://dx.doi.org/10.2105/AJPH.2016.303088>.
47. For a brief explanation of the strengths and limitations of population- and community-based sampling, see Hottes *et al.*, e2.
48. 95% confidence intervals: 8–15% and 3–5%, respectively.
49. 95% confidence interval: 18–22%.
50. Ana Maria Buller *et al.*, “Associations between Intimate Partner Violence and Health among Men Who Have Sex with Men: A Systematic Review and Meta-Analysis,” *PLOS Medicine* 11, no. 3 (2014): e1001609, <http://dx.doi.org/10.1371/journal.pmed.1001609>.
51. Sabrina N. Nowinski and Erica Bowen, “Partner violence against heterosexual and gay men: Prevalence and correlates,” *Aggression and Violent Behavior* 17, no. 1 (2012): 36–52, <http://dx.doi.org/10.1016/j.avb.2011.09.005>. It is worth noting that the 54 studies that Nowinski and Bowen consider operationalize heterosexuality and homosexuality in various ways.
52. *Ibid.*, 39.
53. *Ibid.*, 50.
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54. Shonda M. Craft and Julianne M. Serovich, “Family-of-Origin Factors and Partner Violence in the Intimate Relationships of Gay Men Who Are HIV Positive,” *Journal of Interpersonal Violence* 20, no. 7 (2005): 777–791, <http://dx.doi.org/10.1177/0886260505277101>.

55. Catherine Finneran and Rob Stephenson, “Intimate Partner Violence Among Men Who Have Sex With Men: A Systematic Review,” *Trauma, Violence, & Abuse* 14, no. 2 (2013): 168–185, <http://dx.doi.org/10.1177/1524838012470034>.

56. *Ibid.*, 180.

57. Although one study reported just 12%, the majority of studies (17 out of 24) showed that physical IPV was at least 22%, with nine studies recording rates of 31% or more.

58. Although Finneran and Stephenson say this measure was recorded in only six studies, the table they provide lists eight studies as measuring psychological violence, with seven of these showing rates 33% or higher, including five reporting rates of 45% or higher.

59. Naomi G. Goldberg and Ilan H. Meyer, “Sexual Orientation Disparities in History of Intimate Partner Violence: Results From the California Health Interview Survey,” *Journal of Interpersonal Violence* 28, no. 5 (2013): 1109–1118, <http://dx.doi.org/10.1177/0886260512459384>.

60. Gregory L. Greenwood *et al.*, “Battering Victimization Among a Probability-Based Sample of Men Who Have Sex With Men,” *American Journal of Public Health* 92, no. 12 (2002): 1964–1969, <http://dx.doi.org/10.2105/AJPH.92.12.1964>.

61. *Ibid.*, 1967.

62. *Ibid.*

63. Sari L. Reisner *et al.*, “Mental Health of Transgender Youth in Care at an Adolescent Urban Community Health Center: A Matched Retrospective Cohort Study,” *Journal of Adolescent Health* 56, no. 3 (2015): 274–279, <http://dx.doi.org/10.1016/j.jadohealth.2014.10.264>.

64. Relative risk: 3.95.

65. Relative risk: 3.27.

66. Relative risk: 3.61.

67. Relative risk: 3.20.

68. Relative risk: 4.30.

69. Relative risk: 2.36.

70. Relative risk: 4.36.

71. Anne P. Haas, Philip L. Rodgers, and Jody Herman, “Suicide Attempts Among Transgender and Gender Non-Conforming Adults: Findings of the National Transgender Discrimination Survey,” Williams Institute, UCLA School of Law, January 2014, <http://williamsinstitute.law.ucla.edu/wp-content/uploads/AFSP-Williams-Suicide-Report->

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72. *Ibid.*, 2.

73. *Ibid.*, 8.

74. *Ibid.*, 13.

75. Kristen Clements-Nolle *et al.*, “HIV Prevalence, Risk Behaviors, Health Care Use, and Mental Health Status of Transgender Persons: Implications for Public Health Intervention,” *American Journal of Public Health* 91, no. 6 (2001): 915–921, <http://dx.doi.org/10.2105/AJPH.91.6.915>.

76. *Ibid.*, 919.

77. See, for example, Ilan H. Meyer, “Minority Stress and Mental Health in Gay Men,” *Journal of Health and Social Behavior* 36 (1995): 38–56, <http://dx.doi.org/10.2307/2137286>; Bruce P. Dohrenwend, “Social Status and Psychological Disorder: An Issue of Substance and an Issue of Method,” *American Sociological Review* 31, no. 1 (1966): 14–34, <http://www.jstor.org/stable/2091276>.

78. For overviews of the social stress model and mental health patterns among LGBT populations, see Ilan H. Meyer, “Prejudice, Social Stress, and Mental Health in Lesbian, Gay, and Bisexual Populations: Conceptual Issues and Research Evidence,” *Psychological Bulletin* 129, no. 5 (2003): 674–697, <http://dx.doi.org/10.1037/0033-2909.129.5.674>; Robert Graham *et al.*, *The Health of Lesbian, Gay, Bisexual, and Transgender People, op. cit.*; Gregory M. Herek and Linda D. Garnets, “Sexual Orientation and Mental Health,” *Annual Review of Clinical Psychology* 3 (2007): 353–375, <http://dx.doi.org/10.1146/annurev.clinpsy.3.022806.091510>; Mark L. Hatzenbuehler, “How Does Sexual Minority Stigma ‘Get Under the Skin’? A Psychological Mediation Framework,” *Psychological Bulletin* 135, no. 5 (2009): 707–730, <http://dx.doi.org/10.1037/a0016441>.

79. See, for instance, Ilan H. Meyer, “The Right Comparisons in Testing the Minority Stress Hypothesis: Comment on Savin-Williams, Cohen, Joyner, and Rieger (2010),” *Archives of Sexual Behavior* 39, no. 6 (2010): 1217–1219.

80. This should not be taken to suggest that social stress is too vague a concept for empirical social science; the social stress model may certainly produce quantitative empirical hypotheses, such as hypotheses about correlations between stressors and specific mental health outcomes. In this context, the term “model” does not refer to a statistical model of the kind often used in social science research—the social stress model is a “model” in a metaphorical sense.

81. Meyer, “Prejudice, Social Stress, and Mental Health in Lesbian, Gay, and Bisexual Populations,” 676.

82. Meyer, “Prejudice, Social Stress, and Mental Health in Lesbian, Gay, and Bisexual Populations,” 680; Gregory M. Herek, J. Roy Gillis, and Jeanine C. Cogan, “Psychological Sequelae of Hate-Crime Victimization Among Lesbian, Gay, and Bisexual Adults,” *Journal of Consulting and Clinical Psychology* 67, no. 6 (1999): 945–951, <http://dx.doi.org/10.1037/0022-006X.67.6.945>; Allegra R. Gordon and Ilan H. Meyer, “Gender Nonconformity as a Target of Prejudice, Discrimination, and Violence Against LGB

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83. Stotzer, “Gender identity and hate crimes,” 43–52; Emilia L. Lombardi *et al.*, “Gender Violence: Transgender Experiences with Violence and Discrimination,” *Journal of Homosexuality* 42, no. 1 (2002): 89–101, [http://dx.doi.org/10.1300/J082v42n01\\_05](http://dx.doi.org/10.1300/J082v42n01_05); Herek, Gillis, and Cogan, “Psychological Sequelae of Hate-Crime Victimization Among Lesbian, Gay, and Bisexual Adults,” 945–951; Huebner, Rebhook, and Kegeles, “Experiences of Harassment, Discrimination, and Physical Violence Among Young Gay and Bisexual Men,” 1200–1203; Anne H. Faulkner and Kevin Cranston, “Correlates of same-sex sexual behavior in a random sample of Massachusetts high school students,” *American Journal of Public Health* 88, no. 2 (1998): 262–266, <http://dx.doi.org/10.2105/AJPH.88.2.262>.

84. Herek, Gillis, and Cogan, “Psychological Sequelae of Hate-Crime Victimization Among Lesbian, Gay, and Bisexual Adults,” 945–951.

85. Jack McDevitt *et al.*, “Consequences for Victims: A Comparison of Bias- and Non-Bias-Motivated Assaults,” *American Behavioral Scientist* 45, no. 4 (2001): 697–713, <http://dx.doi.org/10.1177/0002764201045004010>.

86. Caitlin Ryan and Ian Rivers, “Lesbian, gay, bisexual and transgender youth: Victimization and its correlates in the USA and UK,” *Culture, Health & Sexuality* 5, no. 2 (2003): 103–119, <http://dx.doi.org/10.1080/1369105011000012883>; Elise D. Berlan *et al.*, “Sexual Orientation and Bullying Among Adolescents in the Growing Up Today Study,” *Journal of Adolescent Health* 46, no. 4 (2010): 366–371, <http://dx.doi.org/10.1016/j.jadohealth.2009.10.015>; Ritch C. Savin-Williams, “Verbal and Physical Abuse as Stressors in the Lives of Lesbian, Gay Male, and Bisexual Youths: Associations With School Problems, Running Away, Substance Abuse, Prostitution, and Suicide,” *Journal of Consulting and Clinical Psychology* 62, no. 2 (1994): 261–269, <http://dx.doi.org/10.1037/0022-006X.62.2.261>.

87. Stephen T. Russell *et al.*, “Lesbian, Gay, Bisexual, and Transgender Adolescent School Victimization: Implications for Young Adult Health and Adjustment,” *Journal of School Health* 81, no. 5 (2011): 223–230, <http://dx.doi.org/10.1111/j.1746-1561.2011.00583.x>.

88. Joanna Almeida *et al.*, “Emotional Distress Among LGBT Youth: The Influence of Perceived Discrimination Based on Sexual Orientation,” *Journal of Youth and Adolescence* 38, no. 7 (2009): 1001–1014, <http://dx.doi.org/10.1007/s10964-009-9397-9>.

89. M. V. Lee Badgett, “The Wage Effects of Sexual Orientation Discrimination,” *Industrial and Labor Relations Review* 48, no. 4 (1995): 726–739, <http://dx.doi.org/10.1177/>

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90. M. V. Lee Badgett, "Bias in the Workplace: Consistent Evidence of Sexual Orientation and Gender Identity Discrimination 1998–2008," *Chicago-Kent Law Review* 84, no. 2 (2009): 559–595, <http://scholarship.kentlaw.iit.edu/cklawreview/vol84/iss2/7>.

91. Marieka Klawitter, "Meta-Analysis of the Effects of Sexual Orientation on Earning," *Industrial Relations* 54, no. 1 (2015): 4–32, <http://dx.doi.org/10.1111/irel.12075>.

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85. 95% confidence interval: 1.8–4.3.

86. MtF transsexuals in the study’s 1973–1988 period showed a higher risk of crime compared to the female controls, suggesting that they maintain a male pattern for criminality. That study period’s FtM transsexuals, however, did show a higher risk of crime compared to the female controls, perhaps related to the effects of exogenous testosterone administration.

87. 95% confidence intervals: 2.9–8.5 and 5.8–62.9, respectively.

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93. 95% confidence intervals: 68–89%, 56–94%, and 72–88%, respectively.

94. *Ibid.*

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96. *Ibid.*

97. *Ibid.*, 228.



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**영어 미숙자를 위한 공고:** 영어를 이해하는 데 어려움이 있으신 경우, 교육부 정보 센터에 일반인 대상 언어 지원 서비스를 요청하실 수 있습니다. 이러한 언어 지원 서비스는 무료로 제공됩니다. 통역이나 번역 서비스에 대해 자세한 정보가 필요하신 경우, 전화번호 1-800-USA-LEARN (1-800-872-5327) 또는 청각 장애인용 전화번호 1-800-877-8339 또는 이메일주소 [Ed.Language.Assistance@ed.gov](mailto:Ed.Language.Assistance@ed.gov) 으로 연락하시기 바랍니다.

**Paunawa sa mga Taong Limitado ang Kaalaman sa English:** Kung nahihirapan kayong makaintindi ng English, maaari kayong humingi ng tulong ukol dito sa inpormasyon ng Kagawaran mula sa nagbibigay ng serbisyo na pagtulong kaugnay ng wika. Ang serbisyo na pagtulong kaugnay ng wika ay libre. Kung kailangan ninyo ng dagdag na inpormasyon tungkol sa mga serbisyo kaugnay ng pagpapaliwanag o pagsasalin, mangyari lamang tumawag sa 1-800-USA-LEARN (1-800-872-5327) (TTY: 1-800-877-8339), o mag-email sa: [Ed.Language.Assistance@ed.gov](mailto:Ed.Language.Assistance@ed.gov).

**Уведомление для лиц с ограниченным знанием английского языка:** Если вы испытываете трудности в понимании английского языка, вы можете попросить, чтобы вам предоставили перевод информации, которую Министерство Образования доводит до всеобщего сведения. Этот перевод предоставляется бесплатно. Если вы хотите получить более подробную информацию об услугах устного и письменного перевода, звоните по телефону 1-800-USA-LEARN (1-800-872-5327) (служба для слабослышащих: 1-800-877-8339), или отправьте сообщение по адресу: [Ed.Language.Assistance@ed.gov](mailto:Ed.Language.Assistance@ed.gov).

EXHIBIT 9



**U.S. Department of Justice**  
*Civil Rights Division*



**U.S. Department of Education**  
*Office for Civil Rights*

May 13, 2016

Dear Colleague:

Schools across the country strive to create and sustain inclusive, supportive, safe, and nondiscriminatory communities for all students. In recent years, we have received an increasing number of questions from parents, teachers, principals, and school superintendents about civil rights protections for transgender students. Title IX of the Education Amendments of 1972 (Title IX) and its implementing regulations prohibit sex discrimination in educational programs and activities operated by recipients of Federal financial assistance.<sup>1</sup> This prohibition encompasses discrimination based on a student's gender identity, including discrimination based on a student's transgender status. This letter summarizes a school's Title IX obligations regarding transgender students and explains how the U.S. Department of Education (ED) and the U.S. Department of Justice (DOJ) evaluate a school's compliance with these obligations.

ED and DOJ (the Departments) have determined that this letter is *significant guidance*.<sup>2</sup> This guidance does not add requirements to applicable law, but provides information and examples to inform recipients about how the Departments evaluate whether covered entities are complying with their legal obligations. If you have questions or are interested in commenting on this guidance, please contact ED at [ocr@ed.gov](mailto:ocr@ed.gov) or 800-421-3481 (TDD 800-877-8339); or DOJ at [education@usdoj.gov](mailto:education@usdoj.gov) or 877-292-3804 (TTY: 800-514-0383).

Accompanying this letter is a separate document from ED's Office of Elementary and Secondary Education, *Examples of Policies and Emerging Practices for Supporting Transgender Students*. The examples in that document are taken from policies that school districts, state education agencies, and high school athletics associations around the country have adopted to help ensure that transgender students enjoy a supportive and nondiscriminatory school environment. Schools are encouraged to consult that document for practical ways to meet Title IX's requirements.<sup>3</sup>

### **Terminology**

- Gender identity* refers to an individual's internal sense of gender. A person's gender identity may be different from or the same as the person's sex assigned at birth.
- Sex assigned at birth* refers to the sex designation recorded on an infant's birth certificate should such a record be provided at birth.
- Transgender* describes those individuals whose gender identity is different from the sex they were assigned at birth. A *transgender male* is someone who identifies as male but was assigned the sex of female at birth; a *transgender female* is someone who identifies as female but was assigned the sex of male at birth.

- *Gender transition* refers to the process in which transgender individuals begin asserting the sex that corresponds to their gender identity instead of the sex they were assigned at birth. During gender transition, individuals begin to live and identify as the sex consistent with their gender identity and may dress differently, adopt a new name, and use pronouns consistent with their gender identity. Transgender individuals may undergo gender transition at any stage of their lives, and gender transition can happen swiftly or over a long duration of time.

### **Compliance with Title IX**

As a condition of receiving Federal funds, a school agrees that it will not exclude, separate, deny benefits to, or otherwise treat differently on the basis of sex any person in its educational programs or activities unless expressly authorized to do so under Title IX or its implementing regulations.<sup>4</sup> The Departments treat a student's gender identity as the student's sex for purposes of Title IX and its implementing regulations. This means that a school must not treat a transgender student differently from the way it treats other students of the same gender identity. The Departments' interpretation is consistent with courts' and other agencies' interpretations of Federal laws prohibiting sex discrimination.<sup>5</sup>

The Departments interpret Title IX to require that when a student or the student's parent or guardian, as appropriate, notifies the school administration that the student will assert a gender identity that differs from previous representations or records, the school will begin treating the student consistent with the student's gender identity. Under Title IX, there is no medical diagnosis or treatment requirement that students must meet as a prerequisite to being treated consistent with their gender identity.<sup>6</sup> Because transgender students often are unable to obtain identification documents that reflect their gender identity (*e.g.*, due to restrictions imposed by state or local law in their place of birth or residence),<sup>7</sup> requiring students to produce such identification documents in order to treat them consistent with their gender identity may violate Title IX when doing so has the practical effect of limiting or denying students equal access to an educational program or activity.

A school's Title IX obligation to ensure nondiscrimination on the basis of sex requires schools to provide transgender students equal access to educational programs and activities even in circumstances in which other students, parents, or community members raise objections or concerns. As is consistently recognized in civil rights cases, the desire to accommodate others' discomfort cannot justify a policy that singles out and disadvantages a particular class of students.<sup>8</sup>

#### **1. Safe and Nondiscriminatory Environment**

Schools have a responsibility to provide a safe and nondiscriminatory environment for all students, including transgender students. Harassment that targets a student based on gender identity, transgender status, or gender transition is harassment based on sex, and the Departments enforce Title IX accordingly.<sup>9</sup> If sex-based harassment creates a hostile environment, the school must take prompt and effective steps to end the harassment, prevent its recurrence, and, as appropriate, remedy its effects. A school's failure to treat students consistent with their gender identity may create or contribute to a hostile environment in violation of Title IX. For a more detailed discussion of Title IX

requirements related to sex-based harassment, see guidance documents from ED's Office for Civil Rights (OCR) that are specific to this topic.<sup>10</sup>

## **2. Identification Documents, Names, and Pronouns**

Under Title IX, a school must treat students consistent with their gender identity even if their education records or identification documents indicate a different sex. The Departments have resolved Title IX investigations with agreements committing that school staff and contractors will use pronouns and names consistent with a transgender student's gender identity.<sup>11</sup>

## **3. Sex-Segregated Activities and Facilities**

Title IX's implementing regulations permit a school to provide sex-segregated restrooms, locker rooms, shower facilities, housing, and athletic teams, as well as single-sex classes under certain circumstances.<sup>12</sup> When a school provides sex-segregated activities and facilities, transgender students must be allowed to participate in such activities and access such facilities consistent with their gender identity.<sup>13</sup>

- Restrooms and Locker Rooms.** A school may provide separate facilities on the basis of sex, but must allow transgender students access to such facilities consistent with their gender identity.<sup>14</sup> A school may not require transgender students to use facilities inconsistent with their gender identity or to use individual-user facilities when other students are not required to do so. A school may, however, make individual-user options available to all students who voluntarily seek additional privacy.<sup>15</sup>
- Athletics.** Title IX regulations permit a school to operate or sponsor sex-segregated athletics teams when selection for such teams is based upon competitive skill or when the activity involved is a contact sport.<sup>16</sup> A school may not, however, adopt or adhere to requirements that rely on overly broad generalizations or stereotypes about the differences between transgender students and other students of the same sex (*i.e.*, the same gender identity) or others' discomfort with transgender students.<sup>17</sup> Title IX does not prohibit age-appropriate, tailored requirements based on sound, current, and research-based medical knowledge about the impact of the students' participation on the competitive fairness or physical safety of the sport.<sup>18</sup>
- Single-Sex Classes.** Although separating students by sex in classes and activities is generally prohibited, nonvocational elementary and secondary schools may offer nonvocational single-sex classes and extracurricular activities under certain circumstances.<sup>19</sup> When offering such classes and activities, a school must allow transgender students to participate consistent with their gender identity.
- Single-Sex Schools.** Title IX does not apply to the admissions policies of certain educational institutions, including nonvocational elementary and secondary schools, and private undergraduate colleges.<sup>20</sup> Those schools are therefore permitted under Title IX to set their own

sex-based admissions policies. Nothing in Title IX prohibits a private undergraduate women's college from admitting transgender women if it so chooses.

- **Social Fraternities and Sororities.** Title IX does not apply to the membership practices of social fraternities and sororities.<sup>21</sup> Those organizations are therefore permitted under Title IX to set their own policies regarding the sex, including gender identity, of their members. Nothing in Title IX prohibits a fraternity from admitting transgender men or a sorority from admitting transgender women if it so chooses.
- **Housing and Overnight Accommodations.** Title IX allows a school to provide separate housing on the basis of sex.<sup>22</sup> But a school must allow transgender students to access housing consistent with their gender identity and may not require transgender students to stay in single-occupancy accommodations or to disclose personal information when not required of other students. Nothing in Title IX prohibits a school from honoring a student's voluntary request for single-occupancy accommodations if it so chooses.<sup>23</sup>
- **Other Sex-Specific Activities and Rules.** Unless expressly authorized by Title IX or its implementing regulations, a school may not segregate or otherwise distinguish students on the basis of their sex, including gender identity, in any school activities or the application of any school rule. Likewise, a school may not discipline students or exclude them from participating in activities for appearing or behaving in a manner that is consistent with their gender identity or that does not conform to stereotypical notions of masculinity or femininity (*e.g.*, in yearbook photographs, at school dances, or at graduation ceremonies).<sup>24</sup>

#### **4. Privacy and Education Records**

Protecting transgender students' privacy is critical to ensuring they are treated consistent with their gender identity. The Departments may find a Title IX violation when a school limits students' educational rights or opportunities by failing to take reasonable steps to protect students' privacy related to their transgender status, including their birth name or sex assigned at birth.<sup>25</sup> Nonconsensual disclosure of personally identifiable information (PII), such as a student's birth name or sex assigned at birth, could be harmful to or invade the privacy of transgender students and may also violate the Family Educational Rights and Privacy Act (FERPA).<sup>26</sup> A school may maintain records with this information, but such records should be kept confidential.

- **Disclosure of Personally Identifiable Information from Education Records.** FERPA generally prevents the nonconsensual disclosure of PII from a student's education records; one exception is that records may be disclosed to individual school personnel who have been determined to have a legitimate educational interest in the information.<sup>27</sup> Even when a student has disclosed the student's transgender status to some members of the school community, schools may not rely on this FERPA exception to disclose PII from education records to other school personnel who do not have a legitimate educational interest in the information. Inappropriately disclosing (or requiring students or their parents to disclose) PII from education records to the school community may



violate FERPA and interfere with transgender students' right under Title IX to be treated consistent with their gender identity.

- **Disclosure of Directory Information.** Under FERPA's implementing regulations, a school may disclose appropriately designated directory information from a student's education record if disclosure would not generally be considered harmful or an invasion of privacy.<sup>28</sup> Directory information may include a student's name, address, telephone number, date and place of birth, honors and awards, and dates of attendance.<sup>29</sup> School officials may not designate students' sex, including transgender status, as directory information because doing so could be harmful or an invasion of privacy.<sup>30</sup> A school also must allow eligible students (*i.e.*, students who have reached 18 years of age or are attending a postsecondary institution) or parents, as appropriate, a reasonable amount of time to request that the school not disclose a student's directory information.<sup>31</sup>
  
- **Amendment or Correction of Education Records.** A school may receive requests to correct a student's education records to make them consistent with the student's gender identity. Updating a transgender student's education records to reflect the student's gender identity and new name will help protect privacy and ensure personnel consistently use appropriate names and pronouns.
  - Under FERPA, a school must consider the request of an eligible student or parent to amend information in the student's education records that is inaccurate, misleading, or in violation of the student's privacy rights.<sup>32</sup> If the school does not amend the record, it must inform the requestor of its decision and of the right to a hearing. If, after the hearing, the school does not amend the record, it must inform the requestor of the right to insert a statement in the record with the requestor's comments on the contested information, a statement that the requestor disagrees with the hearing decision, or both. That statement must be disclosed whenever the record to which the statement relates is disclosed.<sup>33</sup>
  - Under Title IX, a school must respond to a request to amend information related to a student's transgender status consistent with its general practices for amending other students' records.<sup>34</sup> If a student or parent complains about the school's handling of such a request, the school must promptly and equitably resolve the complaint under the school's Title IX grievance procedures.<sup>35</sup>

\* \* \*

We appreciate the work that many schools, state agencies, and other organizations have undertaken to make educational programs and activities welcoming, safe, and inclusive for all students.

Sincerely,

/s/

Catherine E. Lhamon  
Assistant Secretary for Civil Rights  
U.S. Department of Education

/s/

Vanita Gupta  
Principal Deputy Assistant Attorney General for Civil Rights  
U.S. Department of Justice

<sup>1</sup> 20 U.S.C. §§ 1681–1688; 34 C.F.R. Pt. 106; 28 C.F.R. Pt. 54. In this letter, the term *schools* refers to recipients of Federal financial assistance at all educational levels, including school districts, colleges, and universities. An educational institution that is controlled by a religious organization is exempt from Title IX to the extent that compliance would not be consistent with the religious tenets of such organization. 20 U.S.C. § 1681(a)(3); 34 C.F.R. § 106.12(a).

<sup>2</sup> Office of Management and Budget, Final Bulletin for Agency Good Guidance Practices, 72 Fed. Reg. 3432 (Jan. 25, 2007), [www.whitehouse.gov/sites/default/files/omb/fedreg/2007/012507\\_good\\_guidance.pdf](http://www.whitehouse.gov/sites/default/files/omb/fedreg/2007/012507_good_guidance.pdf).

<sup>3</sup> ED, *Examples of Policies and Emerging Practices for Supporting Transgender Students* (May 13, 2016), [www.ed.gov/oese/osh/emergerpractices.pdf](http://www.ed.gov/oese/osh/emergerpractices.pdf). OCR also posts many of its resolution agreements in cases involving transgender students online at [www.ed.gov/ocr/lgbt.html](http://www.ed.gov/ocr/lgbt.html). While these agreements address fact-specific cases, and therefore do not state general policy, they identify examples of ways OCR and recipients have resolved some issues addressed in this guidance.

<sup>4</sup> 34 C.F.R. §§ 106.4, 106.31(a). For simplicity, this letter cites only to ED’s Title IX regulations. DOJ has also promulgated Title IX regulations. See 28 C.F.R. Pt. 54. For purposes of how the Title IX regulations at issue in this guidance apply to transgender individuals, DOJ interprets its regulations similarly to ED. State and local rules cannot limit or override the requirements of Federal laws. See 34 C.F.R. § 106.6(b).

<sup>5</sup> See, e.g., *Price Waterhouse v. Hopkins*, 490 U.S. 228 (1989); *Oncale v. Sundowner Offshore Servs. Inc.*, 523 U.S. 75, 79 (1998); *G.G. v. Gloucester Cnty. Sch. Bd.*, No. 15-2056, 2016 WL 1567467, at \*8 (4th Cir. Apr. 19, 2016); *Glenn v. Brumby*, 663 F.3d 1312, 1317 (11th Cir. 2011); *Smith v. City of Salem*, 378 F.3d 566, 572-75 (6th Cir. 2004); *Rosa v. Park W. Bank & Trust Co.*, 214 F.3d 213, 215–16 (1st Cir. 2000); *Schwenk v. Hartford*, 204 F.3d 1187, 1201–02 (9th Cir. 2000); *Schroer v. Billington*, 577 F. Supp. 2d 293, 306-08 (D.D.C. 2008); *Macy v. Dep’t of Justice*, Appeal No. 012012082 (U.S. Equal Emp’t Opportunity Comm’n Apr. 20, 2012). See also U.S. Dep’t of Labor (USDOL), Training and Employment Guidance Letter No. 37-14, *Update on Complying with Nondiscrimination Requirements: Discrimination Based on Gender Identity, Gender Expression and Sex Stereotyping are Prohibited Forms of Sex Discrimination in the Workforce Development System* (2015), [wdr.doleta.gov/directives/attach/TEGL/TEGL\\_37-14.pdf](http://wdr.doleta.gov/directives/attach/TEGL/TEGL_37-14.pdf); USDOL, Job Corps, Directive: Job Corps Program Instruction Notice No. 14-31, *Ensuring Equal Access for Transgender Applicants and Students to the Job Corps Program* (May 1, 2015), [https://supportservices.jobcorps.gov/Program%20Instruction%20Notices/pi\\_14\\_31.pdf](https://supportservices.jobcorps.gov/Program%20Instruction%20Notices/pi_14_31.pdf); DOJ, Memorandum from the Attorney General, *Treatment of Transgender Employment Discrimination Claims Under Title VII of the Civil Rights Act of 1964* (2014), [www.justice.gov/sites/default/files/opa/press-releases/attachments/2014/12/18/title\\_vii\\_memo.pdf](http://www.justice.gov/sites/default/files/opa/press-releases/attachments/2014/12/18/title_vii_memo.pdf); USDOL, Office of Federal Contract Compliance Programs, Directive 2014-02, *Gender Identity and Sex Discrimination* (2014), [www.dol.gov/ofccp/regs/compliance/directives/dir2014\\_02.html](http://www.dol.gov/ofccp/regs/compliance/directives/dir2014_02.html).

<sup>6</sup> See *Lusardi v. Dep’t of the Army*, Appeal No. 0120133395 at 9 (U.S. Equal Emp’t Opportunity Comm’n Apr. 1, 2015) (“An agency may not condition access to facilities—or to other terms, conditions, or privileges of employment—on the completion of certain medical steps that the agency itself has unilaterally determined will somehow prove the bona fides of the individual’s gender identity.”).

<sup>7</sup> See *G.G.*, 2016 WL 1567467, at \*1 n.1 (noting that medical authorities “do not permit sex reassignment surgery for persons who are under the legal age of majority”).

<sup>8</sup> 34 C.F.R. § 106.31(b)(4); see *G.G.*, 2016 WL 1567467, at \*8 & n.10 (affirming that individuals have legitimate and important privacy interests and noting that these interests do not inherently conflict with nondiscrimination principles); *Cruzan v. Special Sch. Dist. No. 1*, 294 F.3d 981, 984 (8th Cir. 2002) (rejecting claim that allowing a transgender woman “merely [to be] present in the women’s faculty restroom” created a hostile environment); *Glenn*, 663 F.3d at 1321 (defendant’s proffered justification that “other women might object to [the plaintiff]’s restroom use” was “wholly irrelevant”). See also *Palmore v. Sidoti*, 466 U.S. 429, 433 (1984) (“Private biases may be outside the reach of the law, but the law cannot, directly or indirectly, give them effect.”); *City of Cleburne v. Cleburne Living Ctr.*, 473 U.S. 432, 448 (1985) (recognizing that “mere negative attitudes, or fear . . . are not permissible bases for” government action).

<sup>9</sup> See, e.g., Resolution Agreement, *In re Downey Unified Sch. Dist., CA*, OCR Case No. 09-12-1095, (Oct. 8, 2014), [www.ed.gov/documents/press-releases/downey-school-district-agreement.pdf](http://www.ed.gov/documents/press-releases/downey-school-district-agreement.pdf) (agreement to address harassment of transgender student, including allegations that peers continued to call her by her former name, shared pictures of her prior to her transition, and frequently asked questions about her anatomy and sexuality); Consent Decree, *Doe v. Anoka-Hennepin Sch. Dist. No. 11, MN* (D. Minn. Mar. 1, 2012), [www.ed.gov/ocr/docs/investigations/05115901-d.pdf](http://www.ed.gov/ocr/docs/investigations/05115901-d.pdf) (consent decree to address sex-based harassment, including based on nonconformity with gender stereotypes); Resolution Agreement, *In re Tehachapi Unified Sch. Dist., CA*, OCR Case No. 09-11-1031 (June 30, 2011), [www.ed.gov/ocr/docs/investigations/09111031-b.pdf](http://www.ed.gov/ocr/docs/investigations/09111031-b.pdf) (agreement to address sexual and gender-based harassment, including harassment based on nonconformity with gender stereotypes). See also *Lusardi*, Appeal No. 0120133395, at \*15 (“Persistent failure to use the employee’s correct name and pronoun may constitute unlawful, sex-based harassment if such conduct is either severe or pervasive enough to create a hostile work environment”).

<sup>10</sup> See, e.g., OCR, *Revised Sexual Harassment Guidance: Harassment of Students by School Employees, Other Students, or Third Parties* (2001), [www.ed.gov/ocr/docs/shguide.pdf](http://www.ed.gov/ocr/docs/shguide.pdf); OCR, *Dear Colleague Letter: Harassment and Bullying* (Oct. 26, 2010), [www.ed.gov/ocr/letters/colleague-201010.pdf](http://www.ed.gov/ocr/letters/colleague-201010.pdf); OCR, *Dear Colleague Letter: Sexual Violence* (Apr. 4, 2011), [www.ed.gov/ocr/letters/colleague-201104.pdf](http://www.ed.gov/ocr/letters/colleague-201104.pdf); OCR, *Questions and Answers on Title IX and Sexual Violence* (Apr. 29, 2014), [www.ed.gov/ocr/docs/qa-201404-title-ix.pdf](http://www.ed.gov/ocr/docs/qa-201404-title-ix.pdf).

<sup>11</sup> See, e.g., Resolution Agreement, *In re Cent. Piedmont Cmty. Coll., NC*, OCR Case No. 11-14-2265 (Aug. 13, 2015), [www.ed.gov/ocr/docs/investigations/more/11142265-b.pdf](http://www.ed.gov/ocr/docs/investigations/more/11142265-b.pdf) (agreement to use a transgender student’s preferred name and gender and change the student’s official record to reflect a name change).

<sup>12</sup> 34 C.F.R. §§ 106.32, 106.33, 106.34, 106.41(b).

<sup>13</sup> See 34 C.F.R. § 106.31.

<sup>14</sup> 34 C.F.R. § 106.33.

<sup>15</sup> See, e.g., Resolution Agreement, *In re Township High Sch. Dist. 211, IL*, OCR Case No. 05-14-1055 (Dec. 2, 2015), [www.ed.gov/ocr/docs/investigations/more/05141055-b.pdf](http://www.ed.gov/ocr/docs/investigations/more/05141055-b.pdf) (agreement to provide any student who requests additional privacy “access to a reasonable alternative, such as assignment of a student locker in near proximity to the office of a teacher or coach; use of another private area (such as a restroom stall) within the public area; use of a nearby private area (such as a single-use facility); or a separate schedule of use.”).

<sup>16</sup> 34 C.F.R. § 106.41(b). Nothing in Title IX prohibits schools from offering coeducational athletic opportunities.

<sup>17</sup> 34 C.F.R. § 106.6(b), (c). An interscholastic athletic association is subject to Title IX if (1) the association receives Federal financial assistance or (2) its members are recipients of Federal financial assistance and have ceded controlling authority over portions of their athletic program to the association. Where an athletic association is covered by Title IX, a school’s obligations regarding transgender athletes apply with equal force to the association.

<sup>18</sup> The National Collegiate Athletic Association (NCAA), for example, reported that in developing its policy for participation by transgender students in college athletics, it consulted with medical experts, athletics officials, affected students, and a consensus report entitled *On the Team: Equal Opportunity for Transgender Student Athletes* (2010) by Dr. Pat Griffin & Helen J. Carroll (*On the Team*), [https://www.ncaa.org/sites/default/files/NCLR\\_TransStudentAthlete%2B\(2\).pdf](https://www.ncaa.org/sites/default/files/NCLR_TransStudentAthlete%2B(2).pdf). See NCAA Office of Inclusion, *NCAA Inclusion of Transgender Student-Athletes 2*, 30-31 (2011), [https://www.ncaa.org/sites/default/files/Transgender\\_Handbook\\_2011\\_Final.pdf](https://www.ncaa.org/sites/default/files/Transgender_Handbook_2011_Final.pdf) (citing *On the Team*). The *On the Team* report noted that policies that may be appropriate at the college level may “be unfair and too complicated for [the high school] level of competition.” *On the Team* at 26. After engaging in similar processes, some state interscholastic athletics associations have adopted policies for participation by transgender students in high school athletics that they determined were age-appropriate.

<sup>19</sup> 34 C.F.R. § 106.34(a), (b). Schools may also separate students by sex in physical education classes during participation in contact sports. *Id.* § 106.34(a)(1).

<sup>20</sup> 20 U.S.C. § 1681(a)(1); 34 C.F.R. § 106.15(d); 34 C.F.R. § 106.34(c) (a recipient may offer a single-sex public nonvocational elementary and secondary school so long as it provides students of the excluded sex a “substantially

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equal single-sex school or coeducational school”).

<sup>21</sup> 20 U.S.C. § 1681(a)(6)(A); 34 C.F.R. § 106.14(a).

<sup>22</sup> 20 U.S.C. § 1686; 34 C.F.R. § 106.32.

<sup>23</sup> See, e.g., Resolution Agreement, *In re Arcadia Unified Sch. Dist., CA*, OCR Case No. 09-12-1020, DOJ Case No. 169-12C-70, (July 24, 2013), [www.justice.gov/sites/default/files/crt/legacy/2013/07/26/arcadiaagree.pdf](http://www.justice.gov/sites/default/files/crt/legacy/2013/07/26/arcadiaagree.pdf) (agreement to provide access to single-sex overnight events consistent with students’ gender identity, but allowing students to request access to private facilities).

<sup>24</sup> See 34 C.F.R. §§ 106.31(a), 106.31(b)(4). See also, *In re Downey Unified Sch. Dist., CA*, *supra* n. 9; *In re Cent. Piedmont Cmty. Coll., NC*, *supra* n. 11.

<sup>25</sup> 34 C.F.R. § 106.31(b)(7).

<sup>26</sup> 20 U.S.C. § 1232g; 34 C.F.R. Part 99. FERPA is administered by ED’s Family Policy Compliance Office (FPCO). Additional information about FERPA and FPCO is available at [www.ed.gov/fpc](http://www.ed.gov/fpc).

<sup>27</sup> 20 U.S.C. § 1232g(b)(1)(A); 34 C.F.R. § 99.31(a)(1).

<sup>28</sup> 34 C.F.R. §§ 99.3, 99.31(a)(11), 99.37.

<sup>29</sup> 20 U.S.C. § 1232g(a)(5)(A); 34 C.F.R. § 99.3.

<sup>30</sup> Letter from FPCO to Institutions of Postsecondary Education 3 (Sept. 2009), [www.ed.gov/policy/gen/guid/fpc/doc/censuslettertohighered091609.pdf](http://www.ed.gov/policy/gen/guid/fpc/doc/censuslettertohighered091609.pdf).

<sup>31</sup> 20 U.S.C. § 1232g(a)(5)(B); 34 C.F.R. §§ 99.3, 99.37(a)(3).

<sup>32</sup> 34 C.F.R. § 99.20.

<sup>33</sup> 34 C.F.R. §§ 99.20-99.22.

<sup>34</sup> See 34 C.F.R. § 106.31(b)(4).

<sup>35</sup> 34 C.F.R. § 106.8(b).



**U.S. Department of Justice**  
Civil Rights Division



**U.S. Department of Education**  
Office for Civil Rights

**Dear Colleague Letter**  
**Notice of Language Assistance**

If you have difficulty understanding English, you may, free of charge, request language assistance services for this Department information by calling 1-800-USA-LEARN (1-800-872-5327) (TTY: 1-800-877-8339), or email us at: [Ed.Language.Assistance@ed.gov](mailto:Ed.Language.Assistance@ed.gov).

**Aviso a personas con dominio limitado del idioma inglés:** Si usted tiene alguna dificultad en entender el idioma inglés, puede, sin costo alguno, solicitar asistencia lingüística con respecto a esta información llamando al 1-800-USA-LEARN (1-800-872-5327) (TTY: 1-800-877-8339), o envíe un mensaje de correo electrónico a: [Ed.Language.Assistance@ed.gov](mailto:Ed.Language.Assistance@ed.gov).

**給英語能力有限人士的通知:** 如果您不懂英語, 或者使用英語有困難, 您可以要求獲得向大眾提供的語言協助服務, 幫助您理解教育部資訊。這些語言協助服務均可免費提供。如果您需要有關口譯或筆譯服務的詳細資訊, 請致電 1-800-USA-LEARN (1-800-872-5327) (聽語障人士專線: 1-800-877-8339), 或電郵: [Ed.Language.Assistance@ed.gov](mailto:Ed.Language.Assistance@ed.gov)。

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**영어 미숙자를 위한 공고:** 영어를 이해하는 데 어려움이 있으신 경우, 교육부 정보 센터에 일반인 대상 언어 지원 서비스를 요청하실 수 있습니다. 이러한 언어 지원 서비스는 무료로 제공됩니다. 통역이나 번역 서비스에 대해 자세한 정보가 필요하신 경우, 전화번호 1-800-USA-LEARN (1-800-872-5327) 또는 청각 장애인용 전화번호 1-800-877-8339 또는 이메일 주소 [Ed.Language.Assistance@ed.gov](mailto:Ed.Language.Assistance@ed.gov) 으로 연락하시기 바랍니다.

**Paunawa sa mga Taong Limitado ang Kaalaman sa English:** Kung nahihirapan kayong makaintindi ng English, maaari kayong humingi ng tulong ukol dito sa impormasyon ng Kagawaran mula sa nagbibigay ng serbisyo na pagtulong kaugnay ng wika. Ang serbisyo na pagtulong kaugnay ng wika ay libre. Kung kailangan ninyo ng dagdag na impormasyon tungkol sa mga serbisyo kaugnay ng pagpapaliwanag o pagsasalin, mangyari lamang tumawag sa 1-800-USA-LEARN (1-800-872-5327) (TTY: 1-800-877-8339), o mag-email sa: [Ed.Language.Assistance@ed.gov](mailto:Ed.Language.Assistance@ed.gov).

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EXHIBIT 10



**U.S. Department of Justice**  
*Civil Rights Division*



**U.S. Department of Education**  
*Office for Civil Rights*

February 22, 2017

Dear Colleague:

The purpose of this guidance is to inform you that the Department of Justice and the Department of Education are withdrawing the statements of policy and guidance reflected in:

- Letter to Emily Prince from James A. Ferg-Cadima, Acting Deputy Assistant Secretary for Policy, Office for Civil Rights at the Department of Education dated January 7, 2015; and
- Dear Colleague Letter on Transgender Students jointly issued by the Civil Rights Division of the Department of Justice and the Department of Education dated May 13, 2016.

These guidance documents take the position that the prohibitions on discrimination “on the basis of sex” in Title IX of the Education Amendments of 1972 (Title IX), 20 U.S.C. § 1681 et seq., and its implementing regulations, see, e.g., 34 C.F.R. § 106.33, require access to sex-segregated facilities based on gender identity. These guidance documents do not, however, contain extensive legal analysis or explain how the position is consistent with the express language of Title IX, nor did they undergo any formal public process.

This interpretation has given rise to significant litigation regarding school restrooms and locker rooms. The U.S. Court of Appeals for the Fourth Circuit concluded that the term “sex” in the regulations is ambiguous and deferred to what the court characterized as the “novel” interpretation advanced in the guidance. By contrast, a federal district court in Texas held that the term “sex” unambiguously refers to biological sex and that, in any event, the guidance was “legislative and substantive” and thus formal rulemaking should have occurred prior to the adoption of any such policy. In August of 2016, the Texas court preliminarily enjoined enforcement of the interpretation, and that nationwide injunction has not been overturned.

In addition, the Departments believe that, in this context, there must be due regard for the primary role of the States and local school districts in establishing educational policy.

In these circumstances, the Department of Education and the Department of Justice have decided to withdraw and rescind the above-referenced guidance documents in order to further and more completely consider the legal issues involved. The Departments thus will not rely on the views expressed within them.

Dear Colleague Letter

Page 2 of 2

Please note that this withdrawal of these guidance documents does not leave students without protections from discrimination, bullying, or harassment. All schools must ensure that all students, including LGBT students, are able to learn and thrive in a safe environment. The Department of Education Office for Civil Rights will continue its duty under law to hear all claims of discrimination and will explore every appropriate opportunity to protect all students and to encourage civility in our classrooms. The Department of Education and the Department of Justice are committed to the application of Title IX and other federal laws to ensure such protection.

This guidance does not add requirements to applicable law. If you have questions or are interested in commenting on this letter, please contact the Department of Education at [ocr@ed.gov](mailto:ocr@ed.gov) or 800-421-3481 (TDD: 800-877-8339); or the Department of Justice at [education@usdoj.gov](mailto:education@usdoj.gov) or 877-292-3804 (TTY: 800-514-0383).

Sincerely,

/s/

Sandra Battle  
Acting Assistant Secretary for Civil Rights  
U.S. Department of Education

/s/

T.E. Wheeler, II  
Acting Assistant Attorney General for Civil Rights  
U.S. Department of Justice



UNITED STATES DEPARTMENT OF EDUCATION  
OFFICE FOR CIVIL RIGHTS

January 7, 2015

Emily T. Prince, Esq.  
[emily@emily-esque.com](mailto:emily@emily-esque.com)

Dear Ms. Prince:

I write in response to your letter, sent via email to the U.S. Department of Education (the Department) on December 14, 2014, regarding transgender students' access to facilities such as restrooms. In your letter, you mentioned statements in recent guidance documents issued by the Department concerning the application of Title IX of the Education Amendments of 1972 (Title IX) to gender identity discrimination. In addition, you identified a particular school district's policy about access to restrooms and asked about the existence and distribution of any guidance by the Department about policies or practices regarding transgender students' access to restrooms. Your letter has been referred to the Department's Office for Civil Rights (OCR), and I am happy to respond.

As you know, OCR's mission includes enforcing Title IX, which prohibits recipients of Federal financial assistance from discriminating on the basis of sex, including gender identity and failure to conform to stereotypical notions of masculinity or femininity.<sup>1</sup> OCR enforces and interprets Title IX consistent with case law,<sup>2</sup> and with the adjudications and guidance documents of other Federal agencies.<sup>3</sup>

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<sup>1</sup> See OCR's April 2014 Questions and Answers on Title IX and Sexual Violence at B-2, <http://www2.ed.gov/about/offices/list/ocr/docs/qa-201404-title-ix.pdf>

<sup>2</sup> See, e.g., *Price Waterhouse v. Hopkins*, 490 U.S. 228, 251 (1989) (holding that Title VII of the Civil Rights Act of 1964's (Title VII) prohibition on sex discrimination bars discrimination based on gender stereotyping, that is "insisting that [individuals] matched the stereotype associated with their group"); *Barnes v. City of Cincinnati*, 401 F.3d 729, 736-39 (6th Cir. 2005) (holding that demotion of transgender police officer because he did not "conform to sex stereotypes concerning how a man should look and behave" stated a claim of sex discrimination under Title VII); *Smith v. City of Salem*, 378 F.3d 566, 574-75 (6th Cir. 2004) ("[D]iscrimination against a plaintiff who is a transsexual – and therefore fails to act and/or identify with his or her gender – is no different from the discrimination directed against Ann Hopkins in *Price Waterhouse*, who, in sex-stereotypical terms, did not act like a woman."); *Rosa v. Park West Bank & Trust Co.*, 214 F.3d 213 (1st Cir. 2000) (applying *Price Waterhouse* to conclude, under the Equal Credit Opportunity Act, that plaintiff states a claim for sex discrimination if bank's refusal to provide a loan application was because plaintiff's "traditionally feminine attire.... did not accord with his male gender"); *Schwenk v. Hartford*, 204 F.3d 1187, 1201-02 (9th Cir. 2000) (holding that discrimination against transgender females – i.e., "as anatomical males whose outward behavior and inward identity [do] not meet social definitions of masculinity" – is actionable discrimination "because of sex" under the Gender Motivated Violence Act").

<sup>3</sup> See, e.g., U.S. Dept. of Justice, Memorandum from the Attorney General regarding the Treatment of



The Department's Title IX regulations permit schools to provide sex-segregated restrooms, locker rooms, shower facilities, housing, athletic teams, and single-sex classes under certain circumstances. When a school elects to separate or treat students differently on the basis of sex in those situations, a school generally must treat transgender students consistent with their gender identity.<sup>4</sup> OCR also encourages schools to offer the use of gender-neutral, individual-user facilities to any student who does not want to use shared sex-segregated facilities.

OCR refrains from offering opinions about specific facts, circumstances, or compliance with federal civil rights laws without first conducting an investigation, and does not release information about its pending investigations. Nevertheless, it may be useful to be aware that in response to OCR's recent investigations of two complaints of gender identity discrimination, recipients have agreed to revise policies to make clear that transgender students should be treated consistent with their gender identity for purposes of restroom access. For examples of how OCR enforces Title IX in this area, please review the following resolutions of OCR investigations involving transgender students: Arcadia Unified School District;<sup>5</sup> and Downey Unified School District.<sup>6</sup>

OCR is committed to helping all students thrive at school and ensuring that schools take action to prevent and respond promptly and effectively to all forms of discrimination, including gender-identity discrimination. OCR staff is also available to

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Transgender Employment Discrimination Claims Under Title VII of the Civil Rights Act of 1964 (Dec. 15, 2014) (stating that the protection of Title VII extends to claims of discrimination based on an individual's gender identity, including transgender status), [http://www.justice.gov/sites/default/files/opa/press-releases/attachments/2014/12/18/title\\_vii\\_memo.pdf](http://www.justice.gov/sites/default/files/opa/press-releases/attachments/2014/12/18/title_vii_memo.pdf); see also *Macy v. Holder*, Appeal No. 012012082 (U.S. Equal Emp't Opportunity Comm'n Apr. 20, 2012) (holding that gender identity and transgender status did not need to be specifically addressed in Title VII in order to be prohibited bases of discrimination, as they are simply part of the protected category of "sex"), <http://www.eeoc.gov/decisions/0120120821%20Macy%20v%20DOJ%20ATF.txt>; U.S. Dept. of Health & Human Services, Office for Civil Rights, *Letter to Maya Rupert, Esq.*, Transaction No. 12-0008000 (July 12, 2012) (stating that Section 1557 of the Affordable Care Act, which incorporates Title IX's prohibition on sex discrimination, "extends to claims of discrimination based on gender identity or failure to conform to stereotypical notions of masculinity or femininity"), <http://www.scribd.com/doc/101981113/Response-on-LGBT-People-in-Sec-1557-in-the-Affordable-Care-Act-from-the-U-S-Dept-of-Health-and-Human-Services>; U.S. Dep't of Labor, Office of Federal Contract Compliance Programs, *Gender Identity and Sex Discrimination*, Directive 2014-02 (Aug. 14, 2014) (directing that for purposes of Executive Order 11246, which prohibits employment discrimination on the basis of sex by federal contractors and subcontractors, "discrimination based on gender identity or transgender status ... is discrimination based on sex"), [http://www.dol.gov/ofccp/regs/compliance/directives/dir2014\\_02.html](http://www.dol.gov/ofccp/regs/compliance/directives/dir2014_02.html).

<sup>4</sup> See, e.g., OCR's December 2014 Questions and Answers on Title IX and Single-Sex Elementary and Secondary Classes and Extracurricular Activities, at Q. 31, <http://www2.ed.gov/about/offices/list/ocr/docs/faqs-title-ix-single-sex-201412.pdf>.

<sup>5</sup> OCR Case No. 09-12-1020 (July 24, 2013), <http://www.justice.gov/crt/about/edu/documents/arcadialetter.pdf> (resolution letter); and <http://www.justice.gov/crt/about/edu/documents/arcadiaagree.pdf> (resolution agreement).


<sup>6</sup> OCR Case No. 09-12-1095 (October 14, 2014), <http://www2.ed.gov/documents/press-releases/downey-school-district-letter.pdf> (resolution letter); and <http://www2.ed.gov/documents/press-releases/downey-school-district-agreement.pdf> (resolution agreement).

offer schools technical assistance on how to comply with Title IX and ensure all students, including transgender students, have equal access to safe learning environments.

If you have questions, want additional information or technical assistance, or believe that a school is engaging in discrimination based on gender identity or another basis protected by the laws enforced by OCR, you may visit OCR's website at [www.ed.gov/ocr](http://www.ed.gov/ocr) or contact OCR at (800) 421-3481 (TDD: 800-877-8339) or at [ocr@ed.gov](mailto:ocr@ed.gov). You may also fill out a complaint form online at [www.ed.gov/ocr/complaintintro.html](http://www.ed.gov/ocr/complaintintro.html).

I hope that this information is helpful and thank you for contacting the Department.

Sincerely,



James A. Ferg-Cadima  
Acting Deputy Assistant Secretary for Policy  
Office for Civil Rights



UNITED STATES DEPARTMENT OF EDUCATION  
OFFICE FOR CIVIL RIGHTS

61 FORSYTH ST., SOUTHWEST, SUITE 19T10  
ATLANTA, GA 30303-8927

REGION IV  
ALABAMA  
FLORIDA  
GEORGIA  
TENNESSEE

December 28, 2015

**U.S. Mail and Email**

Dr. Joseph G. Joyner  
Superintendent  
St. Johns County School District  
40 Orange Street  
St. Augustine, Florida 32084

Re: OCR Complaint # 04-16-1110

Dear Dr. Joyner:

On November 24, 2015, the U.S. Department of Education (Department), Office for Civil Rights (OCR), received the above-referenced complaint filed against the St. Johns County School District (District). Specifically, Ms. Erica Adams Kasper (Complainant) alleges that school officials have disallowed Drew Adams, (Student) a student at Nease High School, to use restrooms that are consistent with his gender identity, instead requiring him to use separate, gender-neutral employee restrooms.

OCR is responsible for enforcing Title IX of the Education Amendments of 1972 (Title IX), as amended, 20 U.S.C. §1681 *et seq.*, and its implementing regulation at 34 C.F.R. Part 106, which prohibit discrimination on the basis of gender in education programs and activities that receive Federal financial assistance from the Department.

Because OCR has determined that it has jurisdiction and that the complaint was filed timely, it is opening this allegation for investigation. Accordingly, OCR will investigate the following issue:

Whether school officials have disallowed the Student to use restrooms at Nease High School that are consistent with his gender identity, instead requiring him to use separate, gender-neutral employee restrooms, in noncompliance with Title IX.

Please note that opening the allegation for investigation in no way implies that OCR has made a determination with regard to its merit. During the investigation, OCR is a neutral fact-finder, collecting and analyzing relevant evidence from the complainant, the recipient, and other sources, as appropriate. OCR will ensure that its investigation is legally sufficient and is dispositive of the allegation, in accordance with the provisions of Article III of the *Case Processing Manual*.

Please read the enclosed document entitled "OCR Complaint Processing Procedures" for information about:

*The Department of Education's mission is to promote student achievement and preparation for global competitiveness by fostering educational excellence and ensuring equal access.*

[www.ed.gov](http://www.ed.gov)

EXHIBIT 11

SJCSD-D.A. 00001

- OCR's complaint evaluation and investigation procedures, including the availability of Early Complaint Resolution (ECR);
- Regulatory prohibitions against retaliation, intimidation, and harassment of persons who file complaints with OCR or participate in an OCR investigation; and,
- Application of the Freedom of Information Act and the Privacy Act to OCR investigations.

OCR intends to conduct a prompt investigation of this complaint. The regulation implementing Title VI, at 34 C.F.R. § 100.6(b) and (c), requires that a recipient of Federal financial assistance make available to OCR information that may be pertinent to reach a compliance determination. This requirement is incorporated by reference by the regulation implementing Title IX regulation at 34 C.F.R. § 106.71. OCR may review personally identifiable records without regard to considerations of privacy or confidentiality.

Accordingly, please forward an un-redacted copy of the following information to us within fifteen calendar days from the date of this letter:

1. A copy of the Nease High School floorplan, showing the location of each classroom and each restroom, identifying
  - a. each restroom not segregated by gender,
  - b. each restroom segregated by gender, identifying the gender,
  - c. the location of the Student's class for each period of the school day.
2. Any and all emails and any other documents relating to access to restrooms by transgender students.
3. Any other pertinent information that would be helpful.

Thank you for your cooperation in this matter. In addition to the information requested above, OCR may need to request additional information and interview pertinent personnel. If an on-site visit is determined to be necessary, you will be contacted to schedule a mutually convenient time for the visit.

Please notify OCR of the name, address, and telephone number of the person who will serve as the District's contact person during the resolution of this complaint. We would like to speak with this person as soon as possible regarding the information requested in this letter.

OCR's goal is the prompt, appropriate resolution of the complaint. While we are proceeding with an investigation, there are other approaches that can achieve this goal. OCR offers an Early Complaint Resolution (ECR) mediation program. ECR allows the Complainant and District to work with an OCR facilitator to resolve this complaint more quickly than through investigation. The Complainant has already indicated an interest in participating in ECR. If you are interested in participating in ECR, please sign and email both of the enclosed participation and confidentiality agreements to the assigned investigator, Roger Mills at [roger.mills@ed.gov](mailto:roger.mills@ed.gov), as soon as possible. Once approved for ECR, an ECR facilitator will contact the parties to discuss the case. Parties are allowed up to 30 calendar days from the date the case is entered into


ECR in which reach a signed agreement. After day 30, ECR will be automatically terminated and this case must be returned to investigation. Accordingly, parties are encouraged to be as available and respond as quickly as possible to the assigned ECR facilitator during the process.

In addition, pursuant to Section 302 of OCR's *Case Processing Manual*, a complaint may be resolved at any time when, before the conclusion of an investigation, the District expresses an interest in resolving the complaint. Please contact Mr. Mills if the District wishes to discuss a 302 voluntary resolution.

Under the Freedom of Information Act, it may be necessary to release this document and related correspondence and records, upon request. If we receive such a request, we will seek to protect, to the extent provided by law, personally identifiable information, which if released could reasonably be expected to constitute an unwarranted invasion of privacy.

OCR is committed to prompt and effective service. If you have any questions, please contact Mr. Mills at (404) 974-9372, or the undersigned at (404) 974-9366, and refer to the docket number noted above.

Sincerely,

A handwritten signature in black ink that reads "Virgil Hollis for". The signature is written in a cursive, somewhat stylized font.

Virgil Hollis  
Compliance Team Leader

Enclosure



Confidential

Joseph G. Joyner, Ed.D.  
Superintendent of Schools

40 Orange Street  
St. Augustine, Florida 32084  
(904) 547-7500  
www.stjohns.k12.fl.us

SCHOOL BOARD

January 15, 2016

Beverly Slough  
District 1

Mr. Virgil Hollis  
Compliance Team Leader  
US Department of Education  
Office of Civil Rights, Region IV  
61 Forsyth Street S.W., Suite 19T10  
Atlanta, GA 30303-8927

Tommy Allen  
District 2

Bill Mignon  
District 3

Kelly Barrera  
District 4

**Re: OCR Complaint No. 04-16-110**  
**Response to Complaint**

Patrick Canan  
District 5

Dear Mr. Hollis,

This letter is a response to the U.S. Department of Education, Office for Civil Rights (OCR) written request for information dated December 28, 2015. The District's contact person in reference to the complaint is:

Cathy Mittelstadt, Associate Superintendent for Student Support Services  
St. Johns County School District  
40 Orange Street  
St. Augustine, FL 32084  
Telephone: 904-547-7723  
Email: Cathy.Mittelstadt@stjohns.k12.fl.us

Based on your letter, information is being requested in response to a complaint filed by Ms. Erica Adams Kasper, on behalf of her child, Drew Adams. The complaint alleges that the school in which her child attends, Allen D. Nease High School has disallowed her child to use restrooms that are consistent with the his gender identity. It states they require him to use a separate, gender-neutral employee restroom. The documents requested in your letter to be provided are the following:

1. A copy of Allen D. Nease High School Floor plan, showing the location of all classrooms and each restroom:
  - a. Each restroom not segregated by gender.
  - b. Each restroom segregated by gender, identifying the gender.
  - c. The location of the Student's class for each period of the school day.
2. Documents and emails relating to access to restrooms by transgender students.
3. Any other pertinent information that would be helpful.

*The St. Johns County School District will inspire good character and a passion for lifelong learning in all students, creating educated and caring contributors to the world.*

**EXHIBIT 12**


**Re: OCR Complaint No. 04-16-110**

**Response to Complaint-continued**

These documents are inclusive in this letter. To the extent that any other relevant documents are located subsequent to the delivery of this response, the District will immediately advise you and send a copy of the document(s).

At this time, the St. Johns County School District declines to participate in the Early Complaint Resolution (ECR) mediation program. Meanwhile, we would appreciate your sharing with Ms. Mittelstadt any case law or other authority supporting the view that providing access to a gender-neutral bathroom is in "noncompliance with Title IX."

Sincerely,



Dr. Joseph G. Joyner  
Superintendent of Schools

PA: sw

Enclosures

cc: Cathy Mittelstadt, Associate Superintendent of Student Support Services

Frank Upchurch, School District Attorney

Kyle Dresback, Principal, Allen D. Nease High School

Brennan Asplen, Deputy Superintendent for Academic and Student Services

UPCHURCH, BAILEY AND UPCHURCH, P.A.

JOHN D. BAILEY, JR.  
FRANK D. UPCHURCH III  
DONALD W. WALLIS  
SIDNEY F. ANSBACHER  
KATHERINE GAERTNER JONES  
MICHAEL A. SIRAGUSA  
STEPHEN A. FAUSTINI  
ALLYSON BOYLES CURRIE

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St. Augustine, Florida 32085-3007

OF COUNSEL:  
TRACY WILSON UPCHURCH  
-----  
FRANK D. UPCHURCH, SR.  
(1894-1986)  
HAMILTON D. UPCHURCH  
(1925-2008)  
FRANK D. UPCHURCH, JR.  
(1922-2012)

March 30, 2016

**VIA FEDERAL EXPRESS**  
**Tracking No. 7759 9756 6171**

Mr. Roger Mills  
U.S. Department of Education  
Office of Civil Rights, Region IV  
61 Forsyth Street S.W., Suite 19T10  
Atlanta, Georgia 30303-8927

Re: OCR Complaint No. 04-16-110

Dear Mr. Mills:

The purpose of this letter is to state the St. Johns County School District's legal position in regard to the D.A. Title IX investigation.

Background

D.A. was born a biological female. Prior to the 2015-16 school year, she was enrolled in St. Johns County schools as a female, and presented as a girl.

In the spring of 2015, D.A. was accepted into the IB program at Nease High School. During the summer, D.A.'s mother contacted school officials<sup>1</sup> and informed them that D.A. self-identified as a male and wished to present as a boy at Nease. The week before school started, school officials met with D.A. and his mother to make sure that the transition would go smoothly. They were supportive and accommodating, allowing D.A. to dress and present as a boy and making sure staff used his preferred name and pronoun. School officials expedited getting his freshman photograph made for his school record and student ID after he told them that he didn't want his 8th grade photograph used on an interim basis because it showed him as a girl, with long hair. School officials also referred him to community groups and events in support of his interest in transgender and LBGTQ issues and activities.

School officials made arrangements for D.A. to use a gender neutral restroom located at the main entrance. In September, the dean received complaints from two

<sup>1</sup> References to "school officials" include Nease staff and District social worker Holly Arkin who had worked with D.A. in middle school and assisted with his support at Nease.

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students that D.A. was using the boys' restroom. School officials met with D.A. and his mother and explained that he should use the gender neutral restroom. No disciplinary action was taken. When he complained that restroom wasn't conveniently located to his classes, school officials converted a staff restroom in Pod K to a gender neutral facility, where it is more conveniently located to his classes.

In January, the school opened another gender neutral restroom. The gender neutral restrooms are appropriately labelled, and open to all students.

#### Overview

At Nease High School, the District provides separate restroom facilities on the basis of sex, as well as gender-neutral facilities. The girls' and boys' restrooms are designated for biological females and biological males, respectively.

We acknowledge that in various correspondence and administrative guidance, the Office of Civil Rights has taken the position that a transgender student should be allowed to use restroom facilities consistent with their gender identity. However, we respectfully disagree that it is a Title IX violation for a school to adhere to the traditional, ubiquitous and perfectly lawful practice of assigning student restroom usage on the basis of biological sex. See, Faulkner v. Jones, 10 F.2d 226, 232 (4th Cir. 1993) (recognizing "society's undisputed approval of separate public restrooms for men and women based on privacy concerns," and that the "need for privacy justifies separation") (emphasis added); Virginia v. United States, 518 U.S. 515, 550, at n. 19 (1996) ("Admitting women to VMI would undoubtedly require alterations necessary to afford members of each sex privacy from members of the other sex").

Indeed, Title IX regulations expressly authorize schools to provide separate restrooms on the basis of sex. Section 106.33 states:

**A recipient may provide separate toilet, locker room, and shower facilities on the basis of sex, but such facilities provided for students of one sex shall be comparable to such facilities provided for students of the other sex.**

34 C.F.R. § 106.33 (emphasis added). Title IX regulations also authorize educational institutions to consider an employee's sex in relation to employment in a locker room or toilet facility used only by members of one sex. 34 C.F.R. § 106.61. Title IX itself authorizes institutions to maintain "separate living facilities for the different sexes." 20 U.S.C.A. § 1686.

Denying a biological female who identifies as a male access to the boys' restroom is not discrimination because of transgender status or gender stereotyping in violation of Title IX. D.A. is not denied access to the boys' restroom because he is transgender or because he does not conform to gender stereotypes. D.A. is not allowed to use the boys'

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restroom because, and only because, the boys' restroom is designated for biological males and D.A. is not a biological male. D.A. is not being discriminated against because of sex, but is being treated exactly the same as all other students, whose access to group restrooms is likewise determined by their biological sex. That is the antithesis of discrimination.

Nevertheless, the school was sensitive to D.A.'s concerns about restroom usage, and made gender neutral facilities available to him. That is a common sense solution. See, Kastl v. Maricopa County Community College District, 325 Fed. Appx. 492, at n. 1 (9th Cir. 2009); Grimm v. Gloucester County School Board, 2015 WL 5560190 (E.D. Va. 2015) ("Grimm"); Johnston v. Univ. of Pittsburgh, 97 F.Supp.3d 657, 661 (W.D. Pa. 2015) ("Johnston"); Doe v. Clark County School Dist., 2008 WL 4372872 (D. Nev. 2008). It protected the bodily privacy of both D.A. and the boys using the boys' restrooms by allowing them to perform personal bodily functions "consistent with society's long-held tradition of performing such functions in sex-segregated spaces based on biological or birth sex." Johnston, 97 F.Supp.3d at 668. The importance of the school's interest in protecting its students' right to bodily privacy in the use of restrooms cannot be seriously questioned. Grimm, 2015 WL 5560190, and cases cited therein, at pp. 21-23.

#### The Title IX Restroom Cases

The courts have consistently rejected OCR's view that it is a Title IX violation to deny a transgender student the use of the restroom that matches the student's gender identity rather than his or her biological sex. E.g., Johnston, 97 F.Supp.3d at 661 ("This case presents one central question: whether a university, receiving federal funds, engages in unlawful discrimination, in violation of the United State Constitution and federal and state statutes, when it prohibits a transgender male student from sex-segregated restrooms ... designated for men on the university campus. The simple answer is no."); Grimm, 2015 WL 5560190, at p. 8 (Section 106.33 "clearly allows the School Board to limit restroom access 'on the basis of sex,' including birth or biological sex."); Clark County School Dist., 2008 WL 4372872, at p. 4 ("Since Mary Doe would have had access to a [gender neutral] restroom had she actually enrolled at GVHS, Plaintiffs cannot possibly establish the first key element required for a Title IX claim."). See also, Johnson v. Fresh Mark, Inc., 337 F. Supp.2d. 996, 1000 (N.D. Ohio 2003) (employer did not violate Title VII when it "only required [the transgender] plaintiff to conform to the accepted principles established for gender-distinct [male and female] public restrooms."); Etsitty v. Utah Transit Authority, 502 F.3d 1215, 1225 (10th Cir. 2007) ("Because an employer's requirement that employees use restrooms matching their biological sex does not expose biological males to disadvantageous terms and does not discriminate against employees who fail to conform to gender stereotypes, [the employer's] proffered reason of concern over restroom usage is not discriminatory on the basis of sex."); Michaels v. Akal Security, Inc., 2010 WL 2573988, at p. 4 (D. Co. 2010) ("Etsitty precludes such a [Title VII] claim based solely upon restrictions on Plaintiff's usage" of restrooms "to those comparable with her anatomical gender pending proof of her gender reassignment surgery."); Goins v. West Group, 635 N.W.2d 717 (Minn. 2001) (employer's "designation of restroom facilities

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based solely on biological gender does not violate the MHRA [Minnesota Human Rights Act]”); Hispanic Aids Forum v. Estate of Bruno, 16 A.D.3d 294 (Ct. App. 2005) (“defendant’s designation of restroom use, applied uniformly, on the basis of ‘biological gender,’ rather than biological self-image, was not discrimination.”).

#### OCR’s Reliance on Title VII Caselaw is Misplaced

None of the cases relied upon by the OCR as stated in the Statement of Interest submitted in support of the plaintiffs in Grimm hold that separating restrooms on the basis of biological sex is a violation of Title IX. Rather, OCR primarily relies upon Title VII cases.

With all due respect, we question the value of Title VII transgender discrimination caselaw in the context of a Title IX transgender restroom discrimination claim. Although Title VII and Title IX both prohibit discrimination “because of sex,” Title IX and its regulations expressly create an exception for toilet facilities, locker rooms and housing, authorizing separate facilities “on the basis of sex.” 34 C.F.R. § 106.33; 20 U.S.C.A. § 1686. **There is no separate restroom exception to discrimination on the basis of sex under Title VII.**

We recognize that under Title VII, an argument can be made that preventing a transgender employee from using the group restroom consistent with his or her gender identity is unlawful discrimination “because of sex.” However, that argument is not credible in the Title IX context. If it is discrimination to assign students to separate restrooms by biological sex, it is lawful discrimination under Title IX because of Section 106.33. E.g., Grimm, 2015 WL 5560190 at p. 12; Johnston, 97 F.Supp.3d at 678. For that reason, Schroer v. Billington, 577 F.Supp.2d 293, 306 (D.D.C. 2008), Lusardi v. McHugh, 2015 WL 1607756 (EEOC 2015), Macy v. Holder, 2012 WL 1435995 (EEOC 2012), and other Title VII cases that embrace the view that making an employment decision based on transgender status is discrimination “because of sex” in violation of Title VII are not persuasive in the context of this investigation. Even assuming arguendo that denying a transgender student use of the restroom that aligns with his or her gender identity is discrimination “because of sex,” it is not unlawful discrimination in violation of Title IX, because Section 106.33 authorizes schools to assign students to separate restroom according to their biological sex.

For the same reason, the argument that transgender is now a protected class under Title VII does not translate to Title IX transgender restroom cases. Accordingly, it cannot be said that Ulane v. Eastern Airlines, 742 F.2d 1081 (7th Cir. 1984), and its progeny are no longer good law in that context. See, Johnston, 97 F.Supp.3d at 676; Etsitty v. Utah Transit Auth., 502 F.3d at 1221-22; Holloway v. Arthur Andersen & Co., 566 F.2d 659, 662-63 (9th Cir. 1977); Sommer v. Budget Mktg., 667 F.2d 748, 750 (8th Cir. 1982); Eure v. Sage Corp., 61 F.Supp.3d 651, 655 (W.D. Tex. 2014); Lopez v. River Oaks Imaging &

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Diagnostic Grp., Inc., 542 F.Supp.2d 653, 658 (S.D. Tex. 2008); and Sweet v. Mulberry Lutheran Home, 2003 WL 21525058, at p. 2 (S.D. Ind. 2003).

Furthermore, it is important to recognize that most of the Title VII cases cited by OCR were based on the gender non-conformity theory developed in Price Waterhouse v. Hopkins, 490 U.S. 228 (1989). The Title VII violations in those cases were based on allegations and evidence that the employer was motivated to take adverse employment action by animus toward the transgender plaintiff, stemming from the plaintiff's failure to conform to sex stereotypes about how men and women should look and act, in some cases including the plaintiff's decision to transition from one sex to another. For example, in Schroer, the court concluded that the Library of Congress violated Title VII when senior staff members changed their minds about hiring the plaintiff after learning that she was undergoing a male to female transition. The court concluded:

In refusing to hire Diane Schroer because her appearance and background did not comport with the decisionmaker's sex stereotypes about how men and women should act and appear, and in response to Schroer's decision to transition, legally, culturally, and physically, from male to female, the Library of Congress violated Title VII's prohibition on sex discrimination.

577 F.Supp.2d at 308. See also, Smith v. City of Salem, Ohio, 378 F.3d 566, 572 (6th Cir. 2004) ("Having alleged that his failure to conform to sex stereotypes concerning how a man should look and behave was the driving force behind Defendants' actions, Smith has sufficiently pleaded claims of sex stereotyping and gender discrimination."); Macy, 2012 WL 143995, at p. 3 (complaint alleged discrimination based on "sex stereotyping, sex discrimination based under transition/change of sex and sex discrimination based gender identity."); Schwenk v. Hartford, 204 F.3d 1187, 1201 (9th Cir. 2000) (discussing Title VII gender stereotype cases).

In the typical case of Title VII transgender discrimination, the employer made a decision to fire, not hire or discipline a transgender person. The decision was made on a personal level, about the individual employee and his or her particular circumstances, and was subject to the employer's gender bias and stereotyping. The plaintiff alleged and in some cases proved that the employer was motivated by animus towards the plaintiff, because the plaintiff's appearance and behavior did not conform to the employer's gender stereotypes about how men and women should look and act. See, Price Waterhouse and cases cited in Glenn v. Brumby, 663 F.3d 1312, 1317-1319 (10th Cir. 2011).

Unlike the employment action in the Title VII cases, the decision to exclude D.A. from the boys' restroom was not personal, and was not motivated by bias on account of D.A.'s individual traits and circumstances. Rather, the school dispassionately followed Section 106.33 and the District's Guidelines and Best Practices for LGBTQ students. D.A.

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was not allowed to use the boys' restrooms because they are designated for biological males and he is a biological female. Unquestionably, D.A. was treated the same as any other biologically female student. Likewise, a biologically male transgender student would not be allowed to use the girls' restrooms because they are designated for biological females. Accordingly, the school did not treat D.A. differently from other students, and there was no Title IX violation.

On the contrary, we submit it would have been a prima facie Title IX violation to treat D.A. "differently" and in a "different manner" from other students and allow him, a biological female, to use the boys' restroom, when all other students must use the restroom designated for their biological sex. Title IX regulations expressly prohibit such disparate treatment. 34 C.F.R. §§ 31(b)(1) - (7).

#### The Meaning of "Sex" as Used in Section 106.33

OCR cites Price Waterhouse and other authorities for the proposition that "sex" now "encompasses" gender identity as well as biological sex. However, as the court recognized in Grimm, it does not follow that gender identity has supplanted biological sex in the context of separate sex restrooms authorized by Section 106.33. While sex may encompass gender identity for some purposes (mainly in gender stereotyping analysis), it does not follow that gender identity has now completely replaced biological sex for purpose of student access to separate boys' and girls' restrooms, particularly in the face of Section 106.33. See, discussion in Grimm, 2015 WL 5560190, at pages 7-9.

#### OCR's Anatomy- Based Gender Stereotype Theory

In its Statement of Interest in Grimm, the government advanced the theory that designating separate restrooms on the basis of biological sex constitutes unlawful gender stereotyping about "the relationship between one's gender identity and anatomy," and "what it means to be a boy." Statement of Interest, at pp. 11 and 13. OCR's reliance on Kastl v. Maricopa County Community College District, 2004 WL 2008954 (D. Ariz. 2004), in support of this theory is misplaced. The case does not suggest any such thing.

Kastl was an adjunct college faculty member, who was transitioning from male to female. She was terminated from her position when she defied the college's directive to use the men's restroom until such time as she provided proof that she had completed sex-change surgery. Significantly, Kastl did not challenge the validity of the college's policy of providing separate restrooms based on genital anatomy. Rather, in her complaint, Kastl alleged that she was a biological female and was being denied the use of the restroom designated for biological females. Id. at pp. 1-2. Based on those allegations, the court declined to dismiss her Title IX claim.

The court did comment that "neither a woman with male genitalia nor a man with stereotypically female anatomy, such as breasts, may be deprived of a benefit or privilege of employment by reason of that nonconforming trait." Id. at p. 2. The court made that

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observation in the context of Kastl's allegation that she was a biological female, although she still had male genitalia. The court was saying that because Kastl (allegedly) was a biological female, her nonconforming anatomical characteristics would not disqualify her from using the women's restroom. The court was not embracing OCR's anatomy-based gender stereotype theory - that it is unlawful gender stereotype discrimination to refuse a biological female the use of the men's restroom because her female anatomy does not conform with her male gender identity. Rather, the court was addressing nonconformity between anatomy and biological sex, not anatomy and gender identity, as OCR would have it.

In Kastl II, 2006 WL 2460636, at p. 6 (D. Ariz. 2006), the court denied Kastl's motion for summary judgment because "she has provided no evidence that she was a biological female and member of a protected class while she was employed by Defendant."

On appeal, in Kastl III, 325 Fed. Appx. at 492, the court affirmed the summary judgment in favor of the college. Noting that "it is unlawful to discriminate against a transgender (or any other person) because he or she does not behave in accordance with an employer's expectations for men or women," the court disagreed with the district court and found that Kastl had stated a prima facie Title VII claim. Id. at 493 (emphasis added). However, the court affirmed the summary judgment, because the plaintiff failed to refute the college's evidence that it was motivated by safety concerns. Although the court did not elaborate on what "nonconforming behavior" motivated the college's decision, it is clear the court was not referring to Kastl's nonconforming anatomy.

Significantly, in a footnote, the appellate court suggested that a gender neutral restroom would have been an acceptable solution:

We note that the parties do not appear to have considered any type of accommodation that would have permitted Kastl to use a restroom other than those dedicated to men. After all, Kastl identified and presented full-time as female, and she argued to MCCCDC that the men's restroom was not only inappropriate for but also potentially dangerous to her.

325 Fed. Appx. at 492, n.1. This is yet more evidence that Kastl does not support OCR's interpretation of Title IX to require restroom assignment based solely on gender identity. If that had been the court's view, the court would not have been concerned with Kastl's biological sex and would have summarily decided the case in her favor, as it was clear that Kastl's gender identity was female.

In fact, Kastl supports the District's position in this investigation. Like the District, its view was that it was not Kastl's gender identity or anatomy, but rather her biological sex that was determinative of whether she could use the women's restroom. It also signaled that it would have been an acceptable accommodation to provide her with access to a gender neutral restroom, as the District did for D.A.

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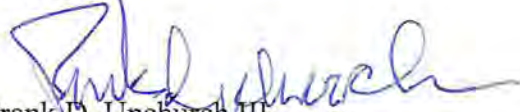
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Conclusion

For the reasons stated above, we respectfully request OCR to find that there was no Title IX violation in D.A.'s case.

Sincerely,

A handwritten signature in blue ink, appearing to read "Frank D. Upchurch, III". The signature is stylized and cursive.

Frank D. Upchurch, III

FDUIII/cs