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Balancing Benefits and Harms of Sexual Orientation and Gender Identity Genomics Research: Legal and Life Implications

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**BALANCING BENEFITS AND HARMS OF SEXUAL
ORIENTATION AND GENDER IDENTITY GENOMICS
RESEARCH: LEGAL AND LIFE IMPLICATIONS**

Lisa E. Smilan*

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INTRODUCTION

Historically and still today, the status of being LGBTQ+ is fraught with discrimination, abuse, and persecution.¹ Given this historical landscape, studying genetic contributions to sexual orientation and gender identity (SOGI)² is controversial.³ One of the first studies

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1. See Brief of the Organization of American Historians as *Amicus Curiae* in Support of Petitioners at 2–4, *Obergefell v. Hodges*, 576 U.S. 644 (2015) (Nos. 14-556, 14-562, 14-571, 14-574).
2. “LGBTQ+,” “sexual orientation and gender identity minorities” and “sexual and gender minorities” are used interchangeably in this Article. Planned Parenthood defines “sexual orientation” as including gay, lesbian, straight, bisexual, and asexual, with the focus being to whom one is attracted and with whom one is interested in having romantic relationships; whereas “gender identity” includes transgender individuals who feel that their assigned sex at birth is very different from the gender they feel that they actually are. See PLANNED PARENTHOOD, *Sexual Orientation*, <https://www.plannedparenthood.org/learn/teens/sexual-orientation> [<https://perma.cc/BF5N-LP77>] (last visited Nov. 5, 2020). In this Article, the term “non-heterosexual” is used to describe people who are gay, lesbian, bisexual, asexual, and pansexual, as well as other labels people use to describe their sexual orientation. Sexual orientation minorities and gender identity minorities are different in many ways, but also related and often grouped together in the mainstream media and scholarly literature. See, e.g., *Bostock v. Clayton County*, 140 S. Ct. 1731 (2020). Notably, in *Bostock*, the Supreme Court viewed the word “sex” under Title VII of the Civil Rights Act of 1964 to apply evenly to plaintiff-employees who were either transgender or gay, making no legal distinction between the two. See *id.* More space is devoted in this Article to sexual orientation minorities because, to date, much of the research involves this group, while there appears to be far less research directly addressing genomics and gender identity status.
3. See generally J. Michael Bailey et al., *Sexual Orientation, Controversy, and Science*, 17(2) 45–101 PSYCH. SCI. PUB. INT. 45, 61 (2016) (discussing several issues regarding sexual orientation and scientific research, including the effect of political controversy on research funding).

purporting to identify a genetic basis for homosexuality, led by Dean Hamer in 1993, elicited both hostility for potentially enabling persecution of gays and praise for supporting homosexuality as natural and immutable.⁴ While Hamer never claimed to have found the “gay gene,” this mischaracterization persists today, as do polarized viewpoints on SOGI genomics research.⁵ In August 2019, the magazine *Science* published a study that examined sexual-behavior and genetics associations, and although the authors discovered certain associations, they also declared it impossible to predict same-sex sexual behavior.⁶ Yet, there are instances where the study’s results have been misappropriated and misrepresented.⁷

There seems to be an almost irresistible urge to take genetic/genomic science and forge it for uses beyond medicine.⁸ The social sciences “are increasingly appealing to genetic data in the search for explanatory factors of human behavior and identities.”⁹ When hard, objective biomedical science is used in conjunction with or to support the more subjective social sciences relating to behavior, traits, and characteristics,¹⁰ legitimacy may be traded in a bad bargain.¹¹ There may be little measurable benefit, and the science, getting lost in translation, may cause more harm than good.¹² This is

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4. See Peter Conrad & Alison Angell, *Homosexuality and Remedicalization*, 41 *Soc’y* 32, 37 (2004).
 5. See *id.*
 6. Andrea Ganna et al., *Large-Scale GWAS Reveals Insights into the Genetic Architecture of Same-Sex Sexual Behavior*, *SCI.*, Aug. 30, 2019, at 1, 6, <https://science.sciencemag.org/content/sci/365/6456/eaat7693.full.pdf> [<https://perma.cc/CE3E-DWKT>].
 7. See Megan Molteni, *How Earnest Research into Gay Genetics Went Wrong*, *WIRED: SCI.* (Nov. 18, 2019, 7:00 AM), <https://www.wired.com/story/how-earnest-research-into-gay-genetics-went-wrong/> [<https://perma.cc/ZQF9-AKE3>]; see also Conrad & Angell, *supra* note 4, at 38 (listing multiple ways Hamer’s research regarding the “gay gene” has been portrayed).
 8. See Conrad & Angell, *supra* note 4, at 38 (showing “personal reasons” that contributed to people supporting Hamer’s genetic research).
 9. Taylor R. Thomas et al., *Community Attitudes on Genetic Research of Gender Identity, Sexual Orientation, and Mental Health*, *PLOS ONE*, July 8, 2020, at 1, 2, <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0235608&type=printable> [<https://perma.cc/9FGZ-2GJ2>].
 10. Not to diminish the significant contributions of the social sciences, but they are necessarily often of a qualitative nature—instead of quantitative—and allow more room for subjectivity.
 11. See Ganna et al., *supra* note 6, at 7 (discussing the “history of misusing genetic results for social purposes”).
 12. See Jane P. Sheldon et al., *Beliefs About the Etiology of Homosexuality and About the Ramifications of Discovering its Possible Genetic Origin*, 52 *J. HOMOSEXUALITY* 111, 141–43 (2007).

especially true in the age of the internet.¹³ With the rapid, fluid, and irretrievable nature of information exchange on the worldwide web, LGBTQ+ genomics research here in the U.S. is at heightened risk for misconstruction and misuse to support hate domestically.¹⁴ The threat also seeps beyond our borders to sixty-nine countries that criminalize same-sex intimate relations and dressing as “the opposite sex,” some imposing the death penalty.¹⁵

While LGBTQ+ people in the U.S. have achieved great legal victories,¹⁶ numerous states maintain laws criminalizing same-sex intimate relations and denying the legitimacy of same-sex marriage.¹⁷ Currently unenforceable, these dormant state laws could go into effect if the U.S. Supreme Court limits or overturns its own precedent.¹⁸ Even if these precedential cases survive, responsible investigators must take care in designing and discussing their SOGI genomics research and be prepared to respond to misrepresentation and misuse in a meaningful way.¹⁹

While federal regulation within our borders is a possibility, we must be mindful of international implications and how the internet, which is virtually boundless, will facilitate the flourishing of scientific distortion.²⁰ Further, gene editing and embryo

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13. See generally *id.*; César G. Escobar-Viera et al., *For Better or for Worse? A Systematic Review of the Evidence on Social Media Use and Depression Among Lesbian, Gay, and Bisexual Minorities*, JMIR MENTAL HEALTH, July 2018, at 7–9, <https://mental.jmir.org/2018/3/e10496/pdf> [<https://perma.cc/LZ6S-PSQY>] (literature review of research finding both protective factors, like connection and support, and risks of harm, such as cyberbullying and resulting depression, associated with LGBTQ+ individuals’ use of social media).
 14. See generally Sheldon et al., *supra* note 12, at 141–43; see generally Escobar-Viera et al., *supra* note 13.
 15. #Outlawed: “The Love that Dare Not Speak Its Name,” HUM. RTS. WATCH, https://features.hrw.org/features/features/lgbt_laws/single.html [<https://perma.cc/EE M4-LY23>] (last visited Nov. 5, 2020) [hereinafter #OUTLAWED].
 16. Chris Geidner, *The Court Cases that Changed L.G.B.T.Q. Rights*, N.Y. TIMES (June 19, 2019), <https://www.nytimes.com/2019/06/19/us/legal-history-lgbtq-rights-timeline.html> [<https://perma.cc/FA55-XNZD>].
 17. See *infra* notes 114–15 and accompanying text.
 18. Natalie Rowthorn et al., *What Happens if the Trumpified Supremes Overturn Roe and Obergefell*, AM. PROSPECT (June 29, 2018), <https://prospect.org/justice/happens-trumpified-supremes-overturn-roe-obergefell/> [<https://perma.cc/8CNZ-ELSS>].
 19. See JAMES REVILL ET AL., GOVERNANCE OF DUAL USE RESEARCH IN THE LIFE SCIENCES: ADVANCING GLOBAL CONSENSUS ON RESEARCH OVERSIGHT: PROCEEDINGS OF A WORKSHOP 24 (2018) (listing aspects to keep in mind when attempting to limit misrepresentation and misuse).
 20. See generally *id.* (focusing mainly on the “inclusiveness” portion, and how including the ideals of other countries may impact scientific distortion).

preimplantation screening may be perceived to make membership in the LGBTQ+ community optional, or a choice, for both individuals and future parents.²¹ This is but one potential consequence of SOGI genomics research.²²

Time and effort must be devoted to contemplating what foresight and built-in protections might make the science of exploring polygenic contributions to SOGI worthwhile without “othering” and oppressing members of this community.²³ Input from members of the community is an essential element in defining suitable research topics, in designing and executing studies, and in the reporting of results.²⁴ It may be appropriate to borrow from frameworks that analyze and aim to craft solutions regarding other difficult questions in the sciences, for example, discourse relating to “dual use” of biotechnology.²⁵ In reaching these considerations, this Article’s narrative weaves chronologically through relevant aspects of history,²⁶ law,²⁷ medicine,²⁸ and science,²⁹ illuminating and reflecting on the interplay of these various contexts—all of which must be considered to fully understand and evaluate the potential benefits and harms of SOGI genomics research.

I. SETTING THE STAGE FOR LGBTQ+ GENOMICS RESEARCH

A. *How we got here: early 1900s–early 2000s*

1. Early assembly and activism in the U.S.

Nearly 100 years ago, Society for Human Rights, the first U.S. gay rights organization, formed in Chicago, Illinois.³⁰ The Society lasted

21. See Sheldon et al., *supra* note 12, at 141–42.

22. See generally *id.* at 141–43 (listing several potential harms of SOGI genomics research).

23. Tinca J.C. Polderman et al., *The Biological Contributions to Gender Identity and Gender Diversity: Bringing Data to the Table*, 48 BEHAV. GENETICS 95, 105 (2018).

24. *Id.*

25. See NAT’L ACADS. OF SCIS., ENG’G, & MED., DUAL USE RESEARCH OF CONCERN IN THE LIFE SCIENCES: CURRENT ISSUES AND CONTROVERSIES 2, 10, 12–14, 72 (2017) (discussing an overview of dual use research and policies in biosecurity).

26. See *infra* Section I.A.

27. See *infra* Sections I.A.3, I.B, II.A.

28. See *infra* Sections I.A.2, II.C.

29. See *infra* Sections I.B, II.B.

30. Salvatore J. Licata, *The Homosexual Rights Movement in the United States: A Traditionally Overlooked Area of American History*, 6 J. HOMOSEXUALITY 161, 163–64 (1981).

only a year before its founder was arrested and put on trial for deviancy.³¹ Throughout much of the 20th century, LGBTQ+ people were denied opportunities for most government employment, barred completely from military service, excluded under immigration laws, targeted by police, and faced discrimination in efforts to assemble and associate.³² In the 1950s, shortly after a national convention and press conference held by the Mattachine Society (then the most prominent gay-rights organization in the U.S.), police raided three organizers' homes and one of them was jailed, subsequently losing his job.³³

2. The role of psychiatry

In 1952, the American Psychiatric Association (APA) referred to “homosexuality” in the first iteration of the Diagnostic and Statistical Manual (DSM-I), describing it as a sociopathic personality disturbance.³⁴ “Homosexuality” was clearly identified as a medical pathology in 1968 in the new DSM-II, categorized as “Sexual Deviation.”³⁵ At the same time, the APA created a new diagnosis for non-heterosexuals who found their sexual orientation distressing and who wished to be straight—the diagnosis of “Sexual Orientation Disturbance,” which gave legitimacy to sexual conversion therapies.³⁶ Throughout the 1950s and 1960s, sporadic activism finally culminated in 1969 with the Stonewall riots in New York City’s Greenwich Village, considered by many as a turning point in the LGBTQ+ rights movement.³⁷ “Cross-dressing” individuals were specifically targeted in the Stonewall police raids, as were gay

31. *See id.*

32. *Obergefell v. Hodges*, 576 U.S. 644, 661 (2015) (citing Brief of the Org. of Am. Historians as *Amicus Curiae* in Support of Petitioners, *supra* note 1, at 5–28).

33. Brief of the Org. of Am. Historians as *Amicus Curiae* in Support of Petitioners, *supra* note 1, at 15.

34. Jack Drescher, *Out of DSM: Depathologizing Homosexuality*, 5 BEHAV. SCIS. 565, 569 (2015). Note that the DSM is referenced throughout this Article, with subsequent iterations indicated by roman numerals as assigned by the APA.

35. *See Conrad & Angell, supra* note 4, at 33.

36. Drescher, *supra* note 34, at 571. Dissident psychiatrists and psychologists went rogue, establishing the National Association for Research & Therapy of Homosexuality (NARTH) in 1992. Brief of the Org. of Am. Historians as *Amicus Curiae* in Support of Petitioners, *supra* note 1, at 24–25. This group advances the idea that non-heterosexuality is a mental disorder that can be cured, and that it is a “potentially deadly lifestyle.” *Id.* at 25.

37. Licata, *supra* note 30, at 167–79.

employees of the establishment.³⁸ After the riots, arrests in New York for “cross-dressing” significantly decreased.³⁹

Believing that psychiatry contributed significantly toward anti-homosexual beliefs and social stigma, gay and lesbian activists disrupted the APA’s 1970 and 1971 annual meetings.⁴⁰ The APA declassified “homosexuality” as a mental disorder in the DSM-II in 1973.⁴¹ By 1980, the APA recognized transgender individuals as suffering from “Gender Identity Disorder.”⁴² In 1987 the APA removed “Ego Dystonic Homosexuality” (which had replaced “Sexual Orientation Disturbance”) when revising its manual as DSM-III-R, delegitimizing gay conversion “therapy” and implicitly accepting non-heterosexuality as a normal variant.⁴³ This can be viewed as the association’s last step toward de-medicalizing non-heterosexuality, however, the experience of transgender individuals remains complicated by a need for a medical diagnosis for clinical billing purposes, and insurance coverage for related sex re-assignment surgeries and treatments.⁴⁴ Under the DSM-V, “gender dysphoria” is now used to describe the “presence of distress associated with incongruence between gender identity and one’s sex assigned at birth.”⁴⁵ Some activists worry that maintaining medical diagnoses surrounding gender identity may be creating a backdoor to re-medicalizing all traits and behaviors of LGBTQ+ people.⁴⁶

3. The role of the law: *Bowers* and the Court’s nod to homophobia

Despite the shift in the APA’s stance on non-heterosexuality, laws in the U.S. continued to discriminate by specifically targeting the community or selectively enforcing “sexual deviance” laws against

38. See Hugh Ryan, *How Dressing in Drag Was Labeled a Crime in the 20th Century*, HISTORY (June 28, 2019), <https://www.history.com/news/stonewall-riots-lgbtq-drag-three-article-rule> [<https://perma.cc/6Z4N-32PG>].

39. *Id.*

40. Drescher, *supra* note 34, at 570.

41. *Id.* at 571.

42. J. Bryan Lowder, *Being Transgender Is No Longer a Disorder: The American Psychiatric Association Salutes the T in LGBT*, SLATE (Dec. 3, 2012, 6:21 PM), <https://slate.com/technology/2012/12/dsm-revision-and-sexual-identity-gender-identity-disorder-replaced-by-gender-dysphoria.html> [<https://perma.cc/6RJ7-WTUQ>]; see B.R. Sharma, *Gender Identity Disorder and its Medico-Legal Considerations*, 47 MED., SCI. & L. 31, 32 (2007).

43. Drescher, *supra* note 34, at 571.

44. Polderman et al., *supra* note 23, at 97.

45. *Id.*

46. Conrad & Angell, *supra* note 4, at 33.

LGBTQ+ people.⁴⁷ From 1974 well into the 2000s, “anti-gay activists introduced and campaigned for more than 100 anti-gay rights referenda across the country.”⁴⁸ The United States Supreme Court gave its stamp of approval to these oppressive state laws and their enforcement in 1986, upholding, in a 5-4 decision, a Georgia “anti-sodomy” law in *Bowers v. Hardwick*.⁴⁹ The specific issue addressed in *Bowers* was whether the U.S. Constitution conferred a fundamental right upon non-heterosexuals to engage in consensual same-sex sexual relations.⁵⁰ The Court refused to extend to same-sex intimate relations the liberty interests surrounding family, marriage and procreation that it previously had held to emanate from the Due Process Clause of the Fourteenth Amendment.⁵¹ These liberty rights, recognized in *Griswold v. Connecticut*,⁵² *Eisenstadt v. Baird*,⁵³ and *Roe v. Wade*,⁵⁴ often referred to as “penumbra rights,” are those not explicitly enumerated in the U.S. Constitution but nonetheless necessary to carry out the express rights there conferred.⁵⁵ The *Bowers* Court voiced disdain for taking “a more expansive view of [its] authority to discover new fundamental rights imbedded in the Due Process Clause,” noting that “[t]he Court is most vulnerable and comes nearest to illegitimacy when it deals with judge made constitutional law having little or no cognizable roots in the language or design of the Constitution.”⁵⁶ Finally, the Court reasoned that the existence of twenty-five “anti-sodomy” laws in individual states, and the majority belief in those states that non-heterosexual sex was

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47. See Jordan Blair Woods, *LGBT Identity and Crime*, 105 CAL. L. REV. 667, 699 (2017).
48. Brief of the Org. of Am. Historians as *Amicus Curiae* in Support of Petitioners, *supra* note 1, at 19; *Id.* at 3 (“No other group in American history has been confronted with as many referenda designed to take away its rights.”).
49. 478 U.S. 186, 196 (1986).
50. *Id.* at 190.
51. *Id.* at 190–91.
52. 381 U.S. 479, 485–86 (1956).
53. 405 U.S. 438, 464–65 (1972).
54. 410 U.S. 113, 166 (1973).
55. *Id.* 152–54. The Court’s recent decision in *June Med. Servs. L.L.C. v. Russo*, 140 S. Ct. 2103, 2133 (2020) does not substantively affect this analysis, as the Court’s ruling there mostly served to follow precedent set in *Whole Woman’s Health v. Hellerstedt*, 136 S. Ct. 2292, 2299 (2016) and its focus on undue burdens placed on a woman’s constitutional right to abortion. See *infra* text accompanying notes 198–99 (reflecting threats to the definition of privacy rights as liberty interests).
56. *Bowers*, 478 U.S. at 194. Several Justices on the current Court share these views and interpretations of the U.S. Constitution. See, e.g., *infra* note 200 and accompanying text.

immoral and unacceptable, further legitimized the Georgia prohibition which the Court likened to prohibitions against adultery, incest, and other sexual crimes.⁵⁷

B. Continued interplay of science, law, and society

1. Battle of the scientists

Through the 1980s, science embarked on a quest to understand sexual orientation.⁵⁸ A prominent biologist and gay man, Douglas Futuyma, and his colleague, Stephen Risch, were some of the early critics of research seeking to identify a genetic basis for same-sex attraction.⁵⁹ In the *Journal of Homosexuality*, the two scholars noted that the majority of psychological and medical literature on non-heterosexual behavior focused on prevention and a cure,⁶⁰ and that the discovery of a genetic basis would be the first step toward that “cure.”⁶¹ Other scholars voiced similar concerns.⁶² In their 1989 book, *Dangerous Diagnostics*, Dorothy Nelkin and Laurence Tancredi argued that the “dangers of a new eugenics” should not be underestimated if science, even if capable of perfect prediction, is used to explain human variation.⁶³ The authors stated that “[i]f biological tests are used to conform people to rigid institutional

57. *Bowers*, 478 U.S. at 196.

58. See, e.g., Richard C. Pillard et al., *A Family Study of Sexual Orientation*, 11 ARCHIVES SEXUAL BEHAV. 511 (1982); Richard C. Pillard & James D. Weinrich, *Evidence of Familial Nature of Male Homosexuality*, 43 ARCHIVES GEN. PSYCHIATRY 808 (1986); James Lindesay, *Laterality Shift in Homosexual Men*, 25 NEUROPSYCHOLOGIA 965–69 (1987); Lee Ellis & M. Ashley Ames, *Neurohormonal Functioning and Sexual Orientation: A Theory of Homosexuality–Heterosexuality*, 101 PSYCH. BULL. 233 (1987). Not addressed here, but highly relevant in considering medical neglect and surveillance during the 1980s, is the AIDS epidemic and its effect of further stigmatizing the gay community. *Milestones in the American Gay Rights Movement*, PBS, <https://www.pbs.org/wgbh/americanexperience/features/stonewall-milestones-american-gay-rights-movement/> [<https://perma.cc/HS6V-27M2>] (last visited Nov. 5, 2020).

59. See Douglas J. Futuyma & Stephen J. Risch, *Sexual Orientation, Sociobiology, and Evolution*, 9 J. HOMOSEXUALITY 157, 157 (1984).

60. *Id.* at 167.

61. Jeremy Yoder, *Let the Mystery Be?*, SLATE (June 18, 2019, 5:50 AM), <https://slate.com/human-interest/2019/06/gay-genetic-research-dna-screening-risks.html> [<https://perma.cc/C6ZT-46P3>].

62. See Sara Reardon, *Massive Study Finds No Single Genetic Cause of Same-Sex Sexual Behavior*, SCI. AM. (August 29, 2019), <https://www.scientificamerican.com/article/massive-study-finds-no-single-genetic-cause-of-same-sex-sexual-behavior/> [<https://perma.cc/6DGT-BDEX>].

63. DOROTHY NELKIN & LAURENCE TANCREDI, *DANGEROUS DIAGNOSTICS: THE SOCIAL POWER OF BIOLOGICAL INFORMATION* 176 (1st ed. 1989).

norms, we risk reducing social tolerance for the variation in human experience. . . . We risk creating a biologic underclass.”⁶⁴

The LGBTQ+ community continued to be treated as a social underclass and science remained engaged in the debate about genetic associations.⁶⁵ In 1991, J. Michael Bailey and Richard Pillard undertook a study of twins and siblings and showed “some possible hereditary factors related to (male) homosexuality.”⁶⁶ In 1992, scholar Abby Lippman expressed skepticism about putting too much stock in genetics, asserting that “identification of the exact chromosomal location of a segment of DNA, [and] even complete knowledge of the base sequences it comprises, will allow only the determination of its presence in a specific person.”⁶⁷ Lippman was adamant that such a finding could not possibly predict “what that person will be like.”⁶⁸ Nonetheless, Dean Hamer, an openly gay National Institutes of Health (NIH) physician and researcher, felt compelled to identify a genetic basis for sexual orientation, or to find the “gay gene.”⁶⁹ Some suggest that one reason Hamer pursued the “gay gene” so fervently was to silence claims that non-heterosexuality is a treatable “disease.”⁷⁰ Further, demonstrating a biological basis for sexual orientation could be used as “ammunition in the war for tolerance of gays and lesbians.”⁷¹ In their study, published in 1993, Hamer and colleagues sought to determine whether male sexual orientation is genetically influenced and proclaimed that their data indicated “a statistically significant correlation between the inheritance of genetic markers on chromosomal region Xq28 and sexual orientation in a selected group of homosexual males.”⁷² Although Hamer never asserted that he actually discovered the “gay gene,” newspaper headlines reported as though he had; for example, a *Wallstreet Journal* headline read

64. *Id.*

65. See Futuyma & Risch, *supra* note 59, at 157.

66. Conrad & Angell, *supra* note 4, at 37.

67. Abby Lippman, *Led (Astray) by Genetic Maps: The Cartography of the Human Genome and Health Care*, 35 SOC. SCI. MED. 1469, 1470 (1992).

68. *Id.*

69. DEAN HAMER & PETER COPELAND, *THE SCIENCE OF DESIRE* 14 (1994).

70. Conrad & Angell, *supra* note 4, at 38.

71. SUZANNA DANUTA WALTERS, *THE TOLERANCE TRAP: HOW GOD, GENES, AND GOOD INTENTIONS ARE SABOTAGING GAY EQUALITY* 89 (2014).

72. Dean H. Hamer et al., *A Linkage Between DNA Markers on the X Chromosome and Male Sexual Orientation*, 261 SCI. 321, 321 (1993).

“Research points toward a ‘gay’ gene” and the *San Francisco Chronicle* led with “New evidence of ‘gay gene’ in some men.”⁷³

2. Framing of the “gay gene”

Hamer’s study elicited mixed responses, and narratives varied based on news outlet and nation.⁷⁴ Framing by the mainstream U.S. media was upbeat and cautiously optimistic, while the gay press was more ambivalent.⁷⁵ In the United Kingdom, the study resulted in skepticism and concern about potentially dire consequences.⁷⁶ Many gay activists in the U.S. believed that showing a genetic basis for sexual orientation would foster societal acceptance of non-heterosexuality as natural and not a choice, and that a theory of immutability could advance a civil rights and anti-discrimination agenda.⁷⁷ Others in the community were wary of the creation of a genetic test for non-heterosexuality that might be used for discriminatory purposes in employment and the procuring of insurance,⁷⁸ and that such a test would reinforce biases by portraying non-heterosexuality as a “genetic defect.”⁷⁹ Additional concerns focused on the potential for selective abortion and “tinker[ing] with the genetic code” in order to weed out potentially gay fetuses or persons; in other words, the use of science for eugenic purposes.⁸⁰

73. Peter Conrad & Susan Markens, *Construing the ‘Gay Gene’ in the News: Optimism and Skepticism in the US and British Press*, 5 HEALTH 373, 380 (2001) (citing various newspaper quotes). While Dean Hamer himself says there is no one gay gene, the myth of the gay gene persists, and the media has played a substantial role in “shaping different public understandings and responses to new genetic knowledge.” *Id.* at 380.

74. *See id.* at 380, 383 (noting that while U.S. reporting on Hamer’s study expressed optimism, reporting on the same study by the British press was more focused on the potential negatives).

75. Conrad & Angell, *supra* note 4, at 38.

76. *See* HAMER & COPELAND, *supra* note 69, at 18 (referring to a Daily Telegraph headline reading, “Claim that Homosexuality is Inherited Prompts Fears that Science Could be Used to Eradicate it”); *see also* Conrad & Markens, *supra* note 73, at 383. Still, while the British press reported mostly with skepticism, it contributed to and perpetuated the erroneous concept of the gay gene. Conrad & Markens, *supra* note 73, at 387.

77. Conrad & Markens, *supra* note 73, at 381; HAMER & COPELAND, *supra* note 69, at 212; Sheldon et al., *supra* note 12, at 115.

78. Conrad & Markens, *supra* note 73, at 382; Kelly Servick, *New Support for ‘Gay Gene’*, SCI., Nov. 21, 2014, at 902.

79. HAMER & COPELAND, *supra* note 69, at 210.

80. Conrad & Markens, *supra* note 73, at 382; HAMER & COPELAND, *supra* note 69, at 210.

3. Hate crimes

The perception of hate aimed at LGBTQ+ people was, and is, based in fact.⁸¹ A rise in reporting and visibility of hate crimes against LGBTQ+ people gave rise to lobbying efforts aimed at protecting the community through anti-hate-crime legislation.⁸² In 1990, the U.S. Senate passed, and President George H.W. Bush signed into law, the Hate Crimes Statistics Act, which listed sexual orientation (including both homosexuality and heterosexuality), race, religion, and ethnicity, as categories on which the U.S. Attorney General must collect statistics relating to certain specified crimes.⁸³ This was the first time the words “gay,” “lesbian,” and “bisexual” appeared in a federal statute.⁸⁴ The Hate Crimes Sentencing Enhancement Act—allowing judges to impose harsher penalties for hate crimes occurring on federal property, including those based on gender and sexual orientation—was added as an amendment to the Violent Crime and Law Enforcement Act of 1994 and subsequently enacted.⁸⁵

4. *Romer* and the Court’s rejection of state-sponsored homophobia

In 1996, the Supreme Court had another opportunity to address discrimination against LGBTQ+ people in *Romer v. Evans*.⁸⁶ Respondents in this case challenged an amendment to the Colorado Constitution that specifically identified, as a solitary class, those persons who were homosexual, lesbian, or bisexual, either by

81. See Tim Fitzsimons, *Nearly 1 in 5 Hate Crimes Motivated By Anti-LGBTQ Bias, FBI Finds*, NBC NEWS (Nov. 12, 2019, 6:36 PM), <https://www.nbcnews.com/feature/nbc-out/nearly-1-5-hate-crimes-motivated-anti-lgbtq-bias-fbi-n1080891> [https://perma.cc/2ZL9-6AKZ].

82. See AVY A. SKOLNIK ET AL., HATE VIOLENCE AGAINST LESBIAN, GAY, BISEXUAL, AND TRANSGENDER PEOPLE IN THE UNITED STATES 1, 21 (2009) (indicating many LGBT anti-violence organizations are working towards continued anti-violence legislation).

83. Hate Crimes Statistics Act of 1990, Pub. L. No. 101–275, 104 Stat. 140, *amended by* S. 909, 111th Cong. (2009) (enacting the Matthew Shepard Hate Crimes Prevention Act to provide funding and technical assistance to state, local, and tribal jurisdictions to improve investigations and prosecutions of hate crimes).

84. *Hate Crimes Protections Timeline*, NAT’L LGBTQ TASK FORCE, https://web.archive.org/web/20140401073246/http://www.thetaskforce.org/issues/hate_crimes_main_page/timeline [https://perma.cc/4F8W-FAG2] (last visited Nov. 9, 2020).

85. Violent Crime Control and Law Enforcement Act of 1994, Pub. L. No. 103-322, 108 Stat. 1796 (codified as amended in scattered sections of Title 34 of the U.S. Code).

86. 517 U.S. 620 (1996).

“orientation, conduct, practices or relationships,” and denied these individuals protection under Colorado anti-discrimination laws.⁸⁷ While it is more vindication than victory when someone’s wrongfully denied rights are restored, the Colorado LGBTQ+ community prevailed in *Romer* when the U.S. Supreme Court struck down the amendment on the basis that it violated the Equal Protection Clause of the U.S. Constitution.⁸⁸ The Court found that the amendment was “born of animosity toward the class of person affected,” and that it had no rational relation to any legitimate governmental purpose.⁸⁹

5. Genetics debate ongoing

On the scientific front, proponents of the “gay gene,” including Hamer, were loath to accept the news in 1999 when scientists George Rice, George Ebers and colleagues reported that their study⁹⁰ failed to replicate a link between male homosexuality and Xq28, the DNA segment Hamer and his colleagues previously had “shown” to be evidence of a gene on the X chromosome that influences homosexuality.⁹¹ The genetics debate continued.⁹²

6. Science embraced for eugenic purposes

Widespread animosity against the LGBTQ+ community held steady in certain realms.⁹³ The appeal of definitively identifying a genetic basis for non-heterosexuality was not solely embraced by those who wanted to promote acceptance and “tolerance” of the community.⁹⁴ Some scholars advocated for the *beneficial eugenic purposes* that could be served by such knowledge.⁹⁵ Baily and Greenberg were particularly blunt in an *Archives of Sexual Behavior* article:

Allowing parents, by means morally unproblematic in themselves, to select for heterosexuality would be morally

87. *Id.* at 623–24; COLO. CONST. art. II, § 30b (West, Westlaw through Nov. 2019 amendments).

88. *See Romer*, 517 U.S. at 635.

89. *Id.* at 634–35.

90. George Rice et al., *Male Homosexuality: Absence of Linkage to Microsatellite Markers at Xq28*, 284 SCI. 665, 665, 667 (1999), <https://science.sciencemag.org/content/284/5414/665.full> [<https://perma.cc/V5Z3-XBUQ>].

91. Ingrid Wickelgren, *Discovery of ‘Gay Gene’ Questioned*, 284 SCI. 571, 571 (1999).

92. *See infra* Sections I.B.5–.6, .8.

93. *See Sheldon et al.*, *supra* note 12, at 140.

94. *Id.* at 139.

95. *Id.* at 140.

acceptable. This is because allowing parents to select their children's sexual orientation would further parents' freedom to raise the sort of children they wish to raise and because selection for heterosexuality may benefit parents and children and is unlikely to cause significant harm.⁹⁶

And in a study reported in 2001, Jane Sheldon and colleagues noted that several of their participants believed that "aborting, changing, or weeding out homosexual individuals" was a way that genetic information could be used for *positive* purposes.⁹⁷ This demonstrates how the bias and policy agendas of those using the information will shape whether genetics research will be deployed to help or harm, and also shape the very definitions of what is helpful versus what is harmful.⁹⁸

7. *Bowers* overturned

A progressive shift occurred in 2003 when the U.S Supreme Court, noting that *stare decisis* is not an inexorable command, boldly overruled *Bowers v. Hardwick*.⁹⁹ In the case *Lawrence v. Texas*,¹⁰⁰ the issue before the Court pertained to the validity of a Texas statute criminalizing two persons of the same sex engaging in "certain intimate sexual conduct."¹⁰¹ Justice Kennedy, writing for the majority stated, "To say that the issue in *Bowers* was simply the right to engage in certain sexual conduct demeans the claim the Respondent there put forward, just as it would demean a married couple were it to be said marriage is simply about the right to have

96. *Id.* at 116–17 (quoting J.M. Bailey & A.S. Greenberg, *Parental Selection of Children's Sexual Orientation*, 30 ARCHIVES SEXUAL BEHAV. 423 (2001)). A recent article produced by Genetic Literacy Project echoed this sentiment. See Wael Taji, *Should Parents Be Allowed to Choose a Child's Sexual Orientation Through Gene Editing?*, GENETIC LITERACY PROJECT (Dec. 13, 2019), <https://geneticliteracyproject.org/2019/12/13/should-parents-be-allowed-to-choose-a-childs-sexual-orientation-through-gene-editing/> [<https://perma.cc/N7XR-6J72>].

97. Sheldon et al., *supra* note 12, at 142.

98. *Id.* Genetic concepts can be used to bolster any number of diverse opinions, "including those suggesting negative eugenic agendas in twenty-first-century America." *Id.* at 145. Extra caution is needed when research aims to identify "genetic mechanisms underlying complex human traits, especially those of an oppressed minority population." *Id.*

99. *Lawrence v. Texas*, 539 U.S. 558, 577–78 (2003) (citing *Payne v. Tennessee*, 501 U.S. 808, 828 (1991) (quoting *Helvering v. Hallock*, 309 U.S. 106, 119 (1940))).

100. *Id.* at 558.

101. *Id.* at 562.

sexual intercourse.”¹⁰² Kennedy wrote that while the Texas statute in *Lawrence* and the Georgia statute in *Bowers* purported only to prohibit a particular sexual act, both laws sought “to control a personal relationship that, whether or not entitled to formal recognition in the law, is within the liberty of persons to choose without being punished as criminals.”¹⁰³ He further declared that “[t]he liberty protected by the Constitution allows homosexual persons the right to make this choice.”¹⁰⁴ The *Lawrence* Court’s conclusion that the petitioners in that case were free as adults to engage in private conduct in the exercise of their liberty under the Due Process Clause of the Fourteenth Amendment rested completely on precedential contraception and abortion cases that had defined that liberty interest, especially *Griswold v. Connecticut*,¹⁰⁵ *Eisenstadt v. Baird*,¹⁰⁶ *Roe v. Wade*,¹⁰⁷ and *Carey v. Population Services, Int’l*.¹⁰⁸

8. Science debate continues

In the world of genetic science, the search for the gay gene continued.¹⁰⁹ Douglas Futuyma again warned in 2005 that studies on the genetic bases for sexual orientation and gender identity could cause more harm than good, stating: “There is only a short distance between understanding the genetic or environmental origins of sexual variation and the possibility of intervention [in order to] ‘cure.’”¹¹⁰

II. WHERE WE ARE TODAY

A. Current concerns with U.S. law

More recently, a 5-4 ruling of the U.S. Supreme Court further vindicated rights of the LGBTQ+ community in *Obergefell v. Hodges*.¹¹¹ The 2015 decision requires states to license marriages between same-sex couples and recognized lawful marriages of same-sex couples when licensed and performed in another jurisdiction.¹¹²

102. *Id.* at 567.

103. *Id.*

104. *Id.*

105. 381 U.S. 479, 484–86 (1965).

106. 405 U.S. 438, 453 (1972).

107. 410 U.S. 113, 152–53 (1973).

108. 431 U.S. 678, 684–85 (1977).

109. *See Yoder, supra* note 61.

110. *Id.*

111. 576 U.S. 644, 675–76, 681 (2015). Note, however, that the Court did not explicitly state that gender identity minorities would be covered by its ruling regarding same-sex marriage. *See id.* at 675–76.

112. *Id.* at 681.

Despite this victory, and the one in the *Lawrence* decision, the LGBTQ+ community and their allies should not lay down the sword just yet.¹¹³ Seventeen years after *Lawrence*, thirteen U.S. states still have laws on the books that conflict with this binding and controlling decision.¹¹⁴ And many states maintain statutory and/or constitutional language defining “marriage” exclusively as a union between one man and one woman.¹¹⁵ Some may consider these dormant laws a

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113. See *Lawrence v. Texas*, 539 U.S. 558, 567, 578–79 (2003) (holding a Texas law criminalizing homosexual sex as unconstitutional); see also *id.* at 593–94 (Scalia, J., dissenting) (arguing the right to homosexual relationships are not “*fundamental* liberty interests” protected by the Constitution).
114. States and relevant code provisions include: GA. CODE ANN. § 16-6-2(a)(1) (West, Westlaw through Laws 2020, Act 477); IDAHO CODE ANN. § 18-6605 (West, Westlaw through 2020 2d Reg. Sess.); KAN. STAT. ANN. § 21-5504 (West, Westlaw through 2020 Reg. & Spec. Sess.); KY. REV. STAT. § 510.100 (West, Westlaw through 2020 Reg. Sess.); LA. STAT. ANN. § 14:89 (Westlaw through 2019 Reg. Sess.); MD. CODE ANN., CRIM. LAW §§ 3-321 to -322 (West, Westlaw through 2020 Reg. Sess.); MASS. GEN. LAWS ANN. ch. 272, §§ 34–35 (West, Westlaw through 2020 2d Ann. Sess.); MICH. COMP. LAWS ANN. §§ 750.158, 750.338 (West, Westlaw through 2020 Reg. Sess.); MINN. STAT. ANN. § 609.293 (West, Westlaw through 2020 Reg. Sess. & 1st & 2d Spec. Sess.); MISS. CODE ANN. § 97-29-59 (West, Westlaw through 2020 Reg. Sess.); N.C. GEN. STAT. ANN. § 14-177 (West, Westlaw through 2020 Reg. Sess.); OKLA. STAT. ANN. tit. 21 § 886 (West, Westlaw through Sept. 1, 2020 of 2d Reg. Sess.); TEX. PENAL CODE ANN. § 21.06 (West, Westlaw through 2019 Reg. Sess.).
115. See, e.g., ALA. CONST. art. 1, § 36.03 (West, Westlaw through Dec. 3, 2018 amendments); ALA. CODE § 30-1-19 (Westlaw through Act 2020-206); ALASKA CONST. art. 1, § 25 (West, Westlaw through Ch. 32 of 2020 Reg. Sess.); ALASKA STAT. ANN. § 25.05.013 (West, Westlaw through Ch. 32 of 2020 Reg. Sess.); ARK. CONST. amend. 83, § 1 (West, Westlaw through 2020 1st Extraordinary Sess. & 2020 Fiscal Sess.); ARK. CODE ANN. § 9-11-109 (West, Westlaw through 2020 1st Extraordinary Sess. & 2020 Fiscal Sess.); GA. CONST. art. 1, § 4, ¶ 1 (West, Westlaw through Laws 2020, Act 477); GA. CODE ANN. § 19-3-3.1 (West, Westlaw through Laws 2020, Act 477 2020); KAN. CONST., art. 15, § 16 (West, Westlaw through 2020 Reg. & Spec. Sess.); KAN. STAT. ANN. § 23-2501 (West, Westlaw through 2020 Reg. & Spec. Sess.); KY. CONST. § 233A (West, Westlaw through 2020 Reg. Sess.); KY. REV. STAT. ANN. § 402.005 (West, Westlaw through 2020 Reg. Sess.); LA. CONST. art. 12, § 15 (West, Westlaw through Jan. 1, 2020 amendments); LA. CIV. CODE arts. 86, 89 & 3520 (Westlaw through 2019 Reg. Sess.); MICH. CONST. art. 1, § 25 (Westlaw through Nov. 2019 amendments); MICH. COMP. LAWS ANN. § 551.1 (West, Westlaw through 2020 Reg. Sess.); MISS. CONST. art. 14, § 263A (West, Westlaw through 2020 Reg. Sess.); MO. CONST. art. 1, § 33 (West, Westlaw through Nov. 6, 2018 General Election); MO. ANN. STAT. § 451.022 (West, Westlaw through 2020 Reg. Sess.); NEB. CONST. art. 1, § 29 (West, Westlaw through March 26, 2020 of 2d Reg. Sess.); N.D. CONST. art. 11, § 28 (West, Westlaw through Nov. 8, 2018 amendments); N.D. CENT. CODE § 14-03-01 (West, Westlaw through Jan. 1, 2020 from 66th General Assembly); OHIO CONST. art. XV, § 11 (West, Westlaw through 133d General Assembly); S.D. CODIFIED LAWS § 25-1-1 (Westlaw through 2020 Sess.).

form of anti-gay equity, accruing interest until the maturity date arrives—i.e., if/when a conservative agenda takes hold.¹¹⁶

B. 2019 “Science” study

In August 2019, with the goal of using science to help people understand that same-sex behavior is natural and normal,¹¹⁷ Andrea Ganna and colleagues (two representing the preeminent Broad Institute) published in the magazine *Science* a study that performed genome-wide association discovery analyses on 477,522 individuals and replication analyses on 15,142 individuals, and follow-up analyses using different aspects of “sexual preference.”¹¹⁸ In the

Laws); TENN. CONST. art. 11, § 18 (West, Westlaw through 2019 General Election); TENN. CODE ANN. § 36-3-113 (West, Westlaw through 2020 1st Reg. Sess.); TEX. CONST. art. 1, § 32 (West, Westlaw through 2019 Reg. Sess.); TEX. FAM. CODE ANN. § 6.204 (West, Westlaw through 2019 Reg. Sess.).

116. See Lawrence O. Gostin et al., *Health Policy in the Supreme Court and a New Conservative Majority*, JAMA NETWORK (Oct. 27, 2020), https://jamanetwork.com/journals/jama/article-abstract/2772515?casa_token=fGt4XyS2MBUAAAAA:-Zt-y8nTp8JxUJIDdSKMN5G3TnLOiU36_PTE6E8gYzkPGjDx1GSATp4Kv7MYmsEF1XYuW0 [<https://perma.cc/6J2U-G695>] (discussing how Justice Amy Coney Barrett’s “elevation to the Supreme Court will have profound consequences for health care and policy” and that “[a] new conservative majority will have the votes to reconsider *Roe*[.]”); see also Richard Wolf, *Gay Marriage Victory at Supreme Court Triggering Backlash*, USA TODAY, <https://www.usatoday.com/story/news/politics/2016/05/29/gay-lesbian-transgender-religious-exemption-supreme-court-north-carolina/84908172/> [<https://perma.cc/7A52-3JH5>] (May 29, 2016 4:32 PM). It is important to note that even now, before the new conservative majority Court issues rulings, LGBTQ+ people (and especially those who are gender identity minorities) still encounter discrimination and abuse at the hands of some in law enforcement. See Carolyn Calhoun, *‘Bullseye on Their Back’: Police Profiling and Abuse of Trans and Gender Non-Conforming Individuals and Solutions Beyond the Department of Justice Guidelines*, 8 ALA. CIV. RTS. & CIV. LIBERTIES L. REV. 127, 131–37 (2017).
117. See Pam Belluck, *Many Genes Influence Same-Sex Sexuality, Not a Single ‘Gay Gene’*, N.Y. TIMES (Aug. 29, 2019) <https://www.nytimes.com/2019/08/29/science/gay-gene-sex.html> [<https://perma.cc/3E3B-378V>].
118. Andrea Ganna et al., *Large-Scale GWAS Reveals Insights into the Genetic Architecture of Same-Sex Sexual Behavior* (Research Article Summary), SCI., Aug. 30, 2019, at 1, <https://science.sciencemag.org/content/sci/365/6456/eaat7693.full.pdf> [<https://perma.cc/6SN5-D759>] [hereinafter Ganna Research Article Summary]. Note that the term “sexual preference” implies a choice, which may be appropriate terminology for individuals who chose to experiment in same-sex sexual relations. See Conrad & Angell, *supra* note 4, at 37. However, “sexual preference” is not synonymous with “sexual orientation.” *Id.* Note, also, that the study excluded transgender, intersex and other “important persons and groups within the queer community.” Ganna et al., *supra* note 6, at 2. Finally, it is interesting that at least eight of the researchers hail from academic departments or institutes focused on mental health, psychology, psychiatry and neuropsychiatry. *Id.* at 1 nn.1–22 (detailing backgrounds of Ganna and his colleagues).

discovery samples, the researchers found five autosomal loci to be “significantly associated with same-sex sexual behavior.”¹¹⁹ However, these five loci “capture only a tiny fraction” (less than one percent) of the genome’s overall contribution.¹²⁰ While the study did not identify any specific genes that would indicate a person’s sexual orientation or gender identity, the authors concluded that “[s]ame-sex sexual behavior is influenced by not one or a few genes but many.”¹²¹ The main takeaway from the study is that genetics do play a role and are responsible for approximately one-third of the influence on whether a person engages in same-sex sexual conduct, but predicting a person’s same-sex sexual behavior based on their genes is impossible.¹²²

A major criticism of the study is that people who had *ever*, even just once, had a same-sex sexual encounter were labeled as “nonheterosexual,”¹²³ which distorts common understanding of what that term means.¹²⁴ An individual might experiment once with same-sex intimacy and it may be that very encounter that makes them realize they are heterosexual.¹²⁵ Thus, the study’s “nonheterosexual” category could include many individuals who do not identify or live as members of the LGBTQ+ community; yet, it may be broadly perceived as a study of genomics research on sexual orientation or gender identity, instead of one on sexual behavior.¹²⁶

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119. Ganna Research Article Summary, *supra* note 118, at 1. The term “autosomal loci” derives from the words “autosome” and “locus.” “Autosome” is defined as follows: “An autosome is any of the numbered chromosomes, as opposed to the sex chromosomes. Humans have 22 pairs of autosomes and one pair of sex chromosomes (the X and Y).” *Autosome*, NAT’L HUMAN GENOME RSCH. INST., <https://www.genome.gov/genetics-glossary/Autosome> [<https://perma.cc/3V7X-32E4>] (last visited Dec. 16, 2020). The word “locus” is defined as follows: “A locus is the specific physical location of a gene or other DNA sequence on a chromosome, like a genetic street address. The plural of locus is ‘loci.’” *Locus*, NAT’L HUMAN GENOME RSCH. INST., <https://www.genome.gov/genetics-glossary/Locus> [<https://perma.cc/C3EH-NNT9>] (last visited Dec. 16, 2020).
120. Broad Commc’ns, *Perspectives on the Complex Genetics of Same-Sex Sexual Behavior*, BROAD INST. (Aug. 29, 2019), <http://www.broadinstitute.org/news/perspectives-complex-genetics-same-sex-sexual-behavior> [<https://perma.cc/E4J6-6D3V>].
121. Ganna Research Article Summary, *supra* note 118, at 1.
122. Broad Commc’ns, *supra* note 120; Belluck, *supra* note 117.
123. *See* Ganna et al., *supra* note 6, at 1.
124. *See id.* at 2 (discussing the potential negative connotations and “othering” of using the term “nonheterosexuals” in figure labeled “Box 1”).
125. *See id.* at 6 (discussing the variances of sexual behavior and sexual orientation).
126. *See id.* This is but one more example of why and how the results may be translated inaccurately. *See* Broad Commc’ns, *supra* note 120.

The authors of the study also noted that there is overlap among the aggregate genetic influences on same-sex sexual behavior and many other traits, “including externalizing behaviors such as smoking, cannabis use, risk-taking, and the personality trait ‘openness to experience.’”¹²⁷ Perhaps another trait associated with the five identified autosomal loci—but one not considered—could be honesty in self-reporting about historically stigmatized and shamed sexual experiences: the five autosomal loci might be significantly associated with truth-telling about same-sex sexual behavior.¹²⁸ Just as the “nonheterosexual” category may seem overinclusive, there may be many excluded from the “nonheterosexual” category because their self-reports on a survey were untruthful.¹²⁹ Participants who live as heterosexuals but had engaged in at least one same-sex sexual encounter may have denied having done so on the survey, for it is possible that these individuals may not share the genetic characteristics associated with honesty about sexual experience.¹³⁰ This is just a thought on the veracity and usefulness, and, thus, validity of the underlying data.

C. *Re-medicalization and othering*

For many decades, the APA medicalized SOGI minority status but finally changed course in the mid-1970s, removing “homosexuality” from the DSM-III.¹³¹ This de-medicalization signaled that LGBTQ+ status was not something to be explained using medical terms, understood through a medical framework, or treated via medical intervention.¹³² While gender identity is still within the realm of the medical field, there is continued concern that genomic research on gender identity may increase stigma toward this minority population and might somehow be used against these individuals.¹³³

127. Ganna Research Article Summary, *supra* note 118, at 1.

128. *See id.* at 5–7. Results of a study based on self-reports on sensitive and stigmatized behaviors may not be the most reliable. *See id.* at 5. Including people who may or may not be true members of this community could prove to be a disservice to researchers who aim to legitimately study genetics and disease in relation to the LGBTQ+ community. *See id.* at 6–7.

129. *See* Belluck, *supra* note 117.

130. *See* Ganna et al., *supra* note 6, at 4–5 (discussing the potential correlations between behavioral traits and same-sex behavior).

131. Conrad & Angell, *supra* note 4, at 33. Conrad and Angell note that originally, psychiatry medicalized homosexuality in an effort to protect against “oppressive legal sanctions,” but “oppressive medical practices still emerged in psychiatric attempts to change homosexuals into heterosexuals.” *Id.* at 32.

132. *See id.* at 32.

133. *See* Polderman et al., *supra* note 23, at 105.

When looking to formulate genetic research agendas related to SOGI, researchers must take care that they do not buy into or support a framing of the issue that “others” LGBTQ+ people.¹³⁴ Taylor Thomas and colleagues advise that stakeholders in the LGBTQ+ community rated sexual orientation and gender identity as “important but not uniquely decisive factors in how individuals feel about research on one aspect of their identity.”¹³⁵ Is it so astounding to discover that non-heterosexual behavior has polygenic associations, like with heterosexual behavior if we were to put heterosexual orientation, identity, and behavior under the microscope? By using heterosexuality as the benchmark against which to compare all other expressions of sexuality and gender identity, we are accepting that one is normal while the others are not.¹³⁶ In fact, in the recent Ganna study, the authors questioned the “validity of bipolar continuum measures such as the Kinsey scale.”¹³⁷ One of the study’s authors, Brendan Zietsch, explicitly stated that the results “suggest we *shouldn’t* be measuring sexual preference on a single continuum from straight to gay.”¹³⁸ Society has done quite enough to “other” LGBTQ+ people without the aid of biomedical science.¹³⁹ It may not appear to be a matter of great significance, but the worry here is that science done with only the best of intentions will be co-opted and used to harm—potentially even eliminating—those viewed as “other.”¹⁴⁰

D. A word on “Tolerance”

Promotion of tolerance is sometimes used to legitimize SOGI genomics research.¹⁴¹ But it is important to note upfront that the word *tolerance* “almost always implies or assumes something negative or undesired.”¹⁴² Affirmative beliefs about genetic

134. *See id.*

135. Thomas et al., *supra* note 9, at 13.

136. *See* Ganna et al., *supra* note 6, at 2 (discussing practices of othering in figure labeled “Box 1”).

137. Ganna Research Article Summary, *supra* note 118, at 1.

138. Nicola Davis, *Scientists Quash Idea of Single ‘Gay Gene’*, *GUARDIAN* (Aug. 29, 2019, 2:00 PM), www.theguardian.com/science/2019/aug/29/scientists-quash-idea-of-single-gay-gene [<https://perma.cc/G95M-65UK>] (emphasis added).

139. *See* Brief of the Org. of Am. Historians as *Amicus Curiae* in Support of Petitioners, *supra* note 1, at 2–4.

140. *See* Thomas et al., *supra* note 9, at 12.

141. *See id.* at 2.

142. WALTERS, *supra* note 71, at 1.

attribution for SOGI are said to be causally related to beliefs about immutability and, in turn, acceptance and “tolerance.”¹⁴³

In what was the “first systematic look at community attitudes toward genetic research at the intersection of sexual orientation, gender identity, and mental health[,]”¹⁴⁴ Thomas and colleagues found that respondents with the lowest levels of “tolerance” for LGBTQ+ people and associated behaviors reported that “they would be more understanding of [LGBTQ+ people] if science provided a biological basis for behaviors and identities they don’t currently understand.”¹⁴⁵ Some social scientists argue that public understanding of the biology and genetics of sexual orientation is crucial to maintaining and growing support and acceptance of LGBTQ+ people,¹⁴⁶ and that genetic explanations for traits and behaviors have increased “tolerance” of LGBTQ+ persons by those outside the community.¹⁴⁷

Others assert that “it is dangerous to stake a claim for acceptance on scientific grounds that, like the Hamer report, may yet be eroded,” and there is scant evidence that “social prejudices are greatly changed by data.”¹⁴⁸ Suzanna Danuta Walters (Walters) asserts that “acceptance is the handmaiden of tolerance,” and that appeal to both or either will not lead to meaningful social inclusion or change.¹⁴⁹ Walters states that “[t]olerance allows homosexuality to remain designated as ‘less than’ heterosexuality, as a problem, as a dilemma, as a threat to the moral good Tolerance cannot do that work of deeper recognition because it is inevitably fixated on a (distancing) acceptance of the (intruding) other.”¹⁵⁰ Walters concludes:

143. See, e.g., Mark R. Joslyn & Donald P. Haider-Markel, *Genetic Attributions, Immutability, and Stereotypical Judgments: An Analysis of Homosexuality*, 97 SOC. SCI. Q. 376, 387 (2016) (“[O]ur results point to the powerful framing influence that a genetic attribution can have on the way people think about individuals and groups.”).

144. Thomas et al., *supra* note 9, at 9.

145. *Id.* at 11.

146. See Joslyn & Haider-Markel, *supra* note 143, at 387.

147. See *id.*

148. Douglas J. Futuyma, *Celebrating Diversity in Sexuality and Gender*, 59 EVOLUTION 1156, 1158 (2005) (reviewing JOAN ROUGHGARDEN, *EVOLUTION’S RAINBOW: DIVERSITY, GENDER, AND SEXUALITY IN NATURE AND PEOPLE* (2004)). An example of this is seen in the context of genetics and race, as genetic research shows that race is nothing more than a social construct, but this finding has done little to end racism. See Nina Jablonski, *The Struggle to Overcome Racism*, 215 NEW SCIENTIST, Sept. 1, 2012, at 26, https://cpb-us-e1.wpmucdn.com/sites.psu.edu/dist/8/10224/files/2014/02/Jablonski.2012.New_Sci_26ff.pdf [<https://perma.cc/N8DU-92HS>].

149. WALTERS, *supra* note 71, at 3.

150. *Id.* at 10.

We would be foolish to believe the fantasy that somehow “proving” immutability would easily and automatically nullify anti-gay animus and homophobia and lead to tolerance. On the contrary, biological arguments about immutable differences and inherent otherness have long been used to demonize, discriminate, and otherwise victimize those who are deemed inferior by “nature” of their birth¹⁵¹

E. A new eugenics

The authors of the Ganna study warned that we must avoid “simplistic conclusions—because the behavioral phenotypes are complex, because our genetic insights are rudimentary, and because there is a long history of misusing genetic results for social purposes.”¹⁵² This statement likely alludes to the eugenics movement during the first half of the 20th century, in which science legitimized forced sterilization, institutionalization, and immigration restrictions based on “undesirable” traits or identities, including LGBTQ+ status.¹⁵³

One of the authors from the Ganna study acknowledges that the study’s findings may be “deliberately misused to advance agendas of hate,” but he seems to believe that by engaging LGBTQ+ community members who initially had resisted the project, and including their suggestions to “clarify wording and highlight caveats” in the study, the authors sufficiently addressed problems and concerns.¹⁵⁴ Notably, stakeholders in the recent Thomas study expressed worries about the potential parallels between the eugenics movement and medical research on SOGI status.¹⁵⁵ The Ganna study authors’ after-the-fact engagement of community members and the Broad Institute’s online publication of critical blog posts cannot be considered effective responses to potential harms and eugenic uses of information.¹⁵⁶

151. *Id.* at 131. History shows us numerous examples of biological theories of difference being marshalled in the service of “categorization, medical experimentation, and even annihilation.” *Id.* at 131–32.

152. Ganna et al., *supra* note 6, at 7.

153. See Thomas et al., *supra* note 9, at 12.

154. Belluck, *supra* note 117.

155. Thomas et al., *supra* note 9, at 12.

156. See Belluck, *supra* note 117.

F. The need for a global perspective

While history reminds us of the atrocities previously perpetrated against minority populations worldwide, we need not reflect on the past for evidence.¹⁵⁷ At present, there are at least sixty-nine countries with national laws criminalizing same-sex relations, and six countries with national laws criminalizing gender expression in a way that targets transgender and gender non-conforming individuals.¹⁵⁸ Sentences range from misdemeanor-level penalties, such as fines, to felony-level penalties, such as the death penalty.¹⁵⁹ In some countries, the laws do not explicitly target LGBTQ+ people, but their selective enforcement against this community serves to facilitate discrimination and to hinder access to health care, police protection, and employment opportunities.¹⁶⁰

In at least three countries—Brunei, Oman, and Kuwait—expression of transgender identity is criminalized at the national level.¹⁶¹ While the United Arab Emirates does not have a federal law against engaging in non-heterosexual sexual relations, laws prohibiting such relationships exist in the penal codes of several of the emirates, including Abu Dhabi, Dubai, and Sharjah.¹⁶² In Tunisia, where the penal code punishes consensual same-sex relations with up to three years imprisonment, authorities are given discretion to punish persons for acts “contrary to ‘morality’ and ‘decency,’”¹⁶³ and forced anal exams are common where homosexual activity is suspected.¹⁶⁴ In 2017, Chad criminalized same-sex sexual relations.¹⁶⁵ In Russia and Lithuania, same-sex acts and non-conforming gender expression are not explicitly prohibited by law, but both countries prohibit any “propaganda” that supports LGBTQ+

157. See generally #OUTLAWED, *supra* note 15 (explaining that sixty-nine countries currently criminalize same-sex conduct, while others criminalize transgender identity and seek to discriminate against LGBTQ+ individuals in all areas of life).

158. *Id.*

159. *See id.*

160. *See id.*

161. *See id.*; see also Rebecca Wright & Alexandra Field, *Brunei's LGBT Community Flees 'Inhumane' New Stoning Laws*, CNN (Apr. 3, 2019, 4:57 AM), <https://www.cnn.com/2019/04/02/asia/brunei-lgbt-inhumane-stoning-laws-intl/index.html> [<https://perma.cc/CX4J-4RKD>] (providing statements from gay and transgender Bruneians who believed that their lives were in danger in Brunei).

162. #OUTLAWED, *supra* note 15.

163. *Tunisia: End Persecution of LGBT People*, HUM. RTS. WATCH (May 17, 2019, 12:00 AM), <https://www.hrw.org/news/2019/05/17/tunisia-end-persecution-lgbt-people> [<https://perma.cc/Q884-B3KU>].

164. *Id.*

165. #OUTLAWED, *supra* note 15.

rights.¹⁶⁶ The death penalty may be imposed for same-sex sexual relations in Iran, Mauritania, Qatar, Saudi Arabia, Sudan and Yemen.¹⁶⁷ Brunei sharia code, enacted in April 2019, rolled out new laws prohibiting sex between women and embracing gender nonconformity, and allowing death by stoning for engaging in anal intercourse.¹⁶⁸ Only after considerable pressure and widespread international condemnation did Brunei announce a moratorium on imposing the death penalty.¹⁶⁹ And recently considered in Uganda was a bill, colloquially known as “Kill the Gays,” under which the death penalty could be imposed for non-heterosexual sexual relations.¹⁷⁰

G. *The U.S. LGBTQ+ community at home*

There has been tremendous progress for the LGBTQ+ community in the U.S.; however, jubilation should be tempered by reality.¹⁷¹ Walters warns that in instances of societal progress “[w]e have seen gains lost, communities come under stepped-up attack, [and] identities reimaged as dangerous and evil.”¹⁷² Sometimes when the tide ebbs, it takes more than it initially brought.¹⁷³

The good news includes the recent 2020 decision, *Bostock v. Clayton Cnty.*,¹⁷⁴ where the U.S. Supreme Court held that an employer who fires an individual employee for being gay or

166. *Id.*

167. *Id.*

168. *Id.*; see also Wright & Field, *supra* note 161 (noting that gay and transgender Bruneians fear for their lives in Brunei under the country's anti-LGBTQ+ laws).

169. Bill Chappell, *Brunei Won't Enforce Death-By-Stoning Law for Gay Sex, Sultan Says*, NPR (May 6, 2019, 11:23 AM), <https://www.npr.org/2019/05/06/720598000/brunei-wont-enforce-death-by-stoning-law-for-gay-sex-sultan-says> [https://perma.cc/JK6G-QMEV].

170. Nita Bhalla, *Uganda Plans Bill Imposing Death Penalty for Gay Sex*, REUTERS (Oct. 10, 2019, 7:09 AM), <https://www.reuters.com/article/us-uganda-lgbt-rights/uganda-plans-bill-imposing-death-penalty-for-gay-sex-idUSKBN1WP1GN> [https://perma.cc/DP26-LGJ9].

171. See generally Brief of the Org. of Am. Historians as *Amicus Curiae* in Support of Petitioners, *supra* note 1, at 4, 20–21, 23–25, 27–28 (providing examples of the discrimination that members of the LGBTQ+ community continue to face). Before we take for granted the gains attained by members of the LGBTQ+ community, it is sobering to note that—as estimated in a report from 2015—there were more than one-thousand hate crimes against LGBTQ+ people annually in the U.S. *Id.* at 4.

172. WALTERS, *supra* note 71, at 9.

173. See Andrew L. Whitehead & Joseph O. Baker, *Homosexuality, Religion, and Science: Moral Authority and the Persistence of Negative Attitudes*, 82 SOCIO. INQUIRY 487, 487–88 (2012) (“[E]ach apparent victory is seemingly matched by setbacks.”).

174. 140 S. Ct. 1731, 1740 (2020).

transgender violates Title VII of the Civil Rights Act of 1964.¹⁷⁵ Up to this point, whether the law afforded protections to individuals in the LGBTQ+ community had been an open question.¹⁷⁶ The Court's answer to that question was a resounding yes.¹⁷⁷ The Court elaborated that one's gay or transgender status need not have been the only reason for the firing to trigger Title VII protections, so long as the status was *one* "but-for" cause of the firing.¹⁷⁸ In writing for the Court, Justice Gorsuch clearly articulated that "homosexuality and transgender status are inextricably bound up with sex ... because to discriminate [based on one's status as gay or transgender] requires an employer to intentionally treat individual employees differently because of their sex."¹⁷⁹

For LGBTQ+ employees whose employers are covered by Title VII, *Bostock* will have positive ramifications for years to come.¹⁸⁰ *Bostock* allows an individual employee who is gay or transgender to sue an employer (that employs fifteen or more employees) in federal court under Title VII of the Civil Rights Act of 1964 for discrimination on the basis of sex.¹⁸¹ This will be quite helpful to the individual LGBTQ+ employee in states that do not provide employment discrimination protections for LGBTQ+ people.¹⁸²

175. *Id.*

176. *Id.* at 1750.

177. *See id.* at 1742.

178. *Id.*

179. *Id.*

180. *See id.* at 1754; Sharita Gruberg, *Beyond Bostock: The Future of LGBTQ Civil Rights*, CTR. FOR AM. PROGRESS (Aug. 26, 2020, 9:01 AM), <https://www.americanprogress.org/issues/lgbtqrights/reports/2020/08/26/489772/beyond-bostock-future-lgbtq-civil-rights/> [<https://perma.cc/UY2P-GE3Z>].

181. *Bostock*, 140 S. Ct. at 1754.

182. *See id.*

At present, 21 states and the District of Columbia expressly prohibit discrimination on the basis of sexual orientation and gender identity by statute or regulation, and a handful more provide some form of protection via agency interpretation or court ruling. For the other half of the country, however, Title VII is the only safeguard LGBT individuals have to protect their livelihood.

Loren AliKhan, *Symposium: A Trio of Cases, a Lot at Stake*, SCOTUSBLOG (Sep. 9, 2019, 3:26 PM), <https://www.scotusblog.com/2019/09/symposium-a-trio-of-cases-a-lot-at-stake/> [<https://perma.cc/X8YY-YX7N>]. "In 27 states, there are no explicit statewide laws at all protecting people from discrimination on the basis of sexual orientation or gender identity in employment, housing and public accommodations." *LGBTQ Americans Aren't Fully Protected from Discrimination in 29 States*,

LGBTQ+ employees working for employers with fewer than fifteen employees (thus, not within the purview of Title VII) will need to advocate for their state courts—in instances where their legislatures have not already done so—to adopt the same definition of “sex” as set forth in *Bostock*.¹⁸³ Yet, *Bostock*’s reach may be limited.¹⁸⁴ For instance, in his dissent, Justice Alito complained that more than one-hundred other federal statutes contain the word “sex,” and predicted that the decision would have far-reaching disastrous consequences.¹⁸⁵ However, Justice Gorsuch maintained that “none of these other laws are before us; we have not had the benefit of adversarial testing about the meaning of their terms, and we do not prejudge any such question today.”¹⁸⁶ Justice Gorsuch also noted that the Religious Freedom Restoration Act of 1993 (RFRA) “operates as a kind of super statute, displacing the normal operation of other federal laws, [since] it [may] supersede Title VII’s commands in appropriate cases.”¹⁸⁷ This should signal to LGBTQ+ community members and their allies the exigency of passing the Equality Act,¹⁸⁸ passed in 2019 by the House of Representatives, but stalled in the Senate.¹⁸⁹ This law must be taken up again and passed in both houses of Congress at the nearest opportunity.¹⁹⁰ In its current iteration, the Equality Act prohibits RFRA from “providing a claim, defense, or basis for challenging” the Equality Act’s protections against “discrimination based on sex, sexual orientation, and gender identity in a wide variety of areas

FREEDOM FOR ALL AMS., [https://www.freedomforallamericans.org/states/\[https://perma.cc/24BA-7QUL\]](https://www.freedomforallamericans.org/states/[https://perma.cc/24BA-7QUL]) (last visited Nov. 5, 2020).

183. See 140 S. Ct. at 1739; Donna Ballman, *Labor and Employment Law: Why Your Employer May Not Be too Small for a Discrimination Claim*, LEXISNEXIS (Sept. 29, 2015), <https://www.lexisnexis.com/legalnewsroom/labor-employment/b/labor-employment-top-blogs/posts/why-your-employer-may-not-be-too-small-for-a-discrimination-claim> [https://perma.cc/B93C-JVEB].
184. See *Bostock*, 140 S. Ct. at 1778 (Alito, J., dissenting).
185. See *id.* (Alito, J., dissenting) (“Over 100 federal statutes prohibit discrimination because of sex.” (citing the record and several federal statutory examples)).
186. *Id.* at 1753. Of note, Justice Gorsuch explicitly stated that the decision had no bearing on issues relating to “bathrooms, locker rooms, or anything else of that kind,” which should indicate to the LGBTQ+ community that much work lies ahead. *Id.*
187. *Id.* at 1754 (citing 42 U.S.C. § 2000bb-3).
188. H.R. 5, 116th Cong. (2019).
189. See Tal Axelrod, *The House-Passed Bills That Have Ended Up in the Senate ‘Graveyard,’* THE HILL (June 23, 2019, 9:51 PM), <https://thehill.com/homenews/senate/449780-a-list-of-the-democratic-legislative-priorities-being-held-up-in-the-senate> [https://perma.cc/DY8K-X55X].
190. See *id.*

including public accommodations and facilities, education, federal funding, employment, housing, credit, and the jury system.”¹⁹¹

Many may believe that LGBTQ+ people already are shielded from government discrimination and persecution—at least relating to non-heterosexual sexual relations and same-sex marriage—due to the constitutionally protected liberty interests recognized in *Lawrence* and *Obergefell*.¹⁹² This assumes, however, that our form of government and respect for individual rights in the U.S. will remain stable and that the legal status quo will endure.¹⁹³ However, as noted earlier, thirteen U.S. states currently have what amount to anti-sodomy/sexual deviance laws on the books.¹⁹⁴ After *Lawrence*, these laws are unenforceable.¹⁹⁵ But the underpinnings of *Lawrence* rest on *Roe*, *Carey*, and *Griswold*: abortion and contraception cases with holdings based on liberty interests not explicitly enumerated within the four corners of the Constitution.¹⁹⁶ Abortion decisions, especially *Roe*, are under constant attack by powerful and influential segments of our society and could cease to exist as prevailing law.¹⁹⁷ Most

191. Congressional Research Serv., *Summary: H.R.5—116th Congress (2019-2020)*, CONGRESS.GOV, <https://www.congress.gov/bill/116th-congress/house-bill/5> [<https://perma.cc/D5P3-W7FQ>] (last visited Nov. 5, 2020); *accord* Equality Act, H.R. 5, 116th Cong. § 9 (2019), <https://www.congress.gov/116/bills/hr5/BILLS-116hr5rfs.pdf> [<https://perma.cc/5AZJ-894R>] (proposing amendments to various sections under Title 42 of the U.S. Code).

192. *Obergefell v. Hodges*, 576 U.S. 644, 681 (2015); *Lawrence v. Texas*, 539 U.S. 558, 578 (2003). Note that decriminalizing an act that was private in the first place, like consensual same-sex sexual relations, does not change the entire landscape of discriminatory practices in society. *See Lawrence*, 539 U.S. at 578. And while same-sex marriage has been legitimized by the Court, challenges and barriers remain; for example, the lived experience of celebrating that marriage with wedding cakes and dresses may still legally be shunned by society. *See, e.g.,* *Masterpiece Cakeshop v. Colo. Civ. Rts. Comm’n*, 138 S. Ct. 1719, 1727–28 (2018).

193. *See, e.g., Obergefell*, 576 U.S. at 681; *Lawrence*, 539 U.S. at 578.

194. *See* sources cited *supra* note 114.

195. *Lawrence*, 539 U.S. at 578–79.

196. *Id.* at 564–66. This Article is not designed to encapsulate a comprehensive review of the myriad dissenting opinions from U.S. Supreme Court Justices on the impropriety of recognizing penumbra liberty interests not explicitly enumerated in the Constitution. *E.g., Griswold v. Connecticut*, 381 U.S. 479, 530–31 (1965) (Stewart, J., dissenting).

197. Nora Ellmann, *State Actions Undermining Abortion Rights in 2020*, CTR. FOR AM. PROGRESS (Aug. 27, 2020, 9:04 AM), <https://www.americanprogress.org/issues/women/reports/2020/08/27/489786/state-actions-undermining-abortion-rights-2020/> [<https://perma.cc/A9PZ-4LFS>]. In his concurrence in the most recent abortion case, Chief Justice Roberts wrote:

Both Louisiana and the providers agree that the undue burden standard announced in *Casey* provides the appropriate framework

recently, in *June Medical Services v. Russo*, a case many abortion opponents had hoped would once and for all obliterate *Roe*,¹⁹⁸ several Justices dissented and the Chief Justice sided with the plurality only on the grounds of *stare decisis*.¹⁹⁹ In his dissent, Justice Thomas opined “[b]ecause we can reconcile neither *Roe* nor its progeny with the text of our Constitution, those decisions should be overruled.”²⁰⁰

Decisions such as *Lawrence* and *Obergefell*—resting on constitutional privacy interests—are all that stand between LGBTQ+ people and many anti-LGBTQ+ state laws.²⁰¹ All it would take is a 5-4 decision overturning *Lawrence* to allow re-criminalization of same-sex sexual relations in the United States.²⁰² The same can be

to analyze Louisiana’s law. Neither party has asked us to reassess the constitutional validity of that standard.

Casey reaffirmed “the most central principle of *Roe v. Wade*,” “a woman’s right to terminate her pregnancy before viability.”

June Med. Servs. v. Russo, 140 S. Ct. 2103, 2135 (2020) (Roberts, C.J., concurring) (plurality opinion) (citations omitted) (quoting *Planned Parenthood of Se. Pa. v. Casey*, 505 U.S. 833, 871 (1992)). Notably, the standard announced in *Casey* was also deemed valid in *Whole Woman’s Health v. Hellerstedt*. 136 S. Ct. 2292, 2309 (2016). Note, however, that Roberts did not join in the *June Med. Servs.* plurality opinion that declared the Louisiana law unconstitutional; instead, he followed the precedent set in *Whole Woman’s Health*, despite fundamentally disagreeing with that decision. *June Med. Servs.*, 140 S. Ct. at 2133. Roberts’ words in the *June Med. Servs.* concurrence may be more intimation than recitation of facts and law, serving to invite and/or instruct opponents of abortion rights to place squarely before the Court the validity of the undue burden standard set forth in *Casey* and *Whole Woman’s Health*—the cases most recently reaffirming the most central principles of *Roe*. See *id.* at 2135. Perhaps, alternatively, the Chief Justice was suggesting that abortion opponents boldly petition the Court to reassess the constitutional validity of the non-enumerated liberty interests relied on in *Roe*. See *id.* at 2133.

198. See generally Ellmann, *supra* note 197.

199. *June Med. Servs.*, 140 S. Ct. at 2133–34 (Roberts, C.J., concurring); see, e.g., *id.* at 2171 (Gorsuch, J., dissenting).

200. *Id.* at 2152–53. (Thomas, J., dissenting). In discussing *Roe*, Justice Thomas stated that “the Court struck down a Texas law restricting abortion as a violation of a woman’s constitutional ‘right of privacy,’ which it grounded in the ‘concept of personal liberty’ purportedly protected by the Due Process Clause of the Fourteenth Amendment.” *Id.* at 2150 (quoting *Roe v. Wade*, 410 U.S. 113, 153 (1973)). Thomas further asserted that “*Roe* is grievously wrong for many reasons, but the most fundamental is that its core holding—that the Constitution protects a woman’s right to abort her unborn child—finds no support in the text of the Fourteenth Amendment.” *Id.*

201. See *Lawrence*, 539 U.S. at 564–66; *Obergefell v. Hodges*, 576 U.S. 644, 663–64 (2015).

202. See *Lawrence*, 539 U.S. at 578–79.

said of *Obergefell*: a ruling that limits or overturns this precedent could resurrect dormant state laws that deny the legitimacy of same-sex marriage.²⁰³ The recent holding in *Bostock* is a reason for optimism, but for the LGBTQ+ person working for an employer with less than fifteen employees, *Bostock* does little to nothing, and there is no guarantee that a subsequent Court will not limit this holding.²⁰⁴ *Bostock* may go no further—its reasoning may not extend to other federal statutes—and by no means should the LGBTQ+ community retreat, lessen advocacy efforts, or let down its guard.²⁰⁵

With the composition of the U.S. Supreme Court changed and changing, most recently with Justice Coney Barrett's elevation, and with lower federal courts now stacked with conservative judges, it is easy to envision the future systematic rolling back of more progressive precedent.²⁰⁶ Just as the Court overruled *Bowers v. Hardwick*, so too it may *Lawrence*, *Obergefell* and *Bostock*. After all, *stare decisis* is not an inexorable command.²⁰⁷

203. See *Obergefell*, 576 U.S. at 681.

204. See *Bostock v. Clayton Cnty.*, 140 S. Ct. 1731, 1753 (2020).

205. See Andrew Koppelman, *Bostock, LGBT Discrimination, and the Subtractive Moves*, 105 MINN. L. REV. HEADNOTES 29–30 (2020) (discussing the numerous strategies deployed in the effort to subtract LGBTQ+ individuals from those people who may benefit from antidiscrimination laws). Criticizing one such strategy propounded in Justice Alito's dissent, Koppelman astutely proposes that "Justice Alito's argument [against applications of the law that were unexpected in 1964], taken to its logical conclusion, prevents law from ever doing more than ratifying existing prejudices." *Id.*

206. See Gostin et al., *supra* note 116; Adam Liptak & Alicia Parlapiano, *Conservatives in Charge, the Supreme Court Moved Right*, N.Y. TIMES (June 28, 2018), <https://www.nytimes.com/interactive/2018/06/28/us/politics/supreme-court-2017-term-moved-right.html> [<https://perma.cc/SFQ9-Z364>]; Rebecca R. Ruiz et al., *A Conservative Agenda Unleashed on the Federal Courts*, N.Y. TIMES (Mar. 16, 2020), <https://www.nytimes.com/2020/03/14/us/trump-appeals-court-judges.html> [<https://perma.cc/MK3L-5PG8>].

207. See *Lawrence*, 539 U.S. at 577 (quoting *Payne v. Tennessee*, 501 U.S. 808, 828 (1991)). Note that in his concurrence with the majority in *June Med. Servs. v. Russo*, Chief Justice Roberts pointed to the 2016 case, *Whole Woman's Health v. Hellerstedt*, 136 S. Ct. 2292, 2330 (2016) (Alito, J., dissenting), in which he had joined the dissent, stating that he believes still to this day that the case "was wrongly decided." *June Med. Servs. v. Russo*, 140 S. Ct. 2103, 2133 (2020) (Roberts, C.J., concurring). However, Roberts stated that "[t]he question today however is not whether *Whole Woman's Health* was right or wrong, but whether to adhere to it in deciding the present case[.]" reasoning that:

The legal doctrine of *stare decisis* requires us, absent special circumstances, to treat like cases alike. The Louisiana law imposes a burden on access to abortion just as severe as that imposed by the Texas law [in *Whole Woman's Health*], for the

III. THEN VERSUS NOW: THE AGE OF THE INTERNET AND ADVANCED BIOTECHNOLOGY

Today, optimism and concerns regarding potential harms of SOGI genomics research mirror those that surfaced around the 1993 Hamer study.²⁰⁸ What is different today is that we now live in a digital world.²⁰⁹ The worldwide web can be employed to further oppress those who already are marginalized—in ways unimaginable in 1993.²¹⁰ Studies on the genetic bases of SOGI minority traits and behaviors may be more dangerous in the age of the internet and with the potential for gene editing.²¹¹ These factors, against the backdrop of a recent surge worldwide in conservative agendas and increased animus toward the LGBTQ+ community, may put LGBTQ+ people at heightened risk of harm from genomics research.²¹²

A. Apps and social media

There is evidence that social media can benefit the LGBTQ+ community, in that it facilitates connection, positive information sharing, and support that “may buffer the impact of geographic isolation, discrimination, and loneliness” that some in this community may experience.²¹³ However, social media also provides a unique forum for bullying.²¹⁴ Likewise, the advent and current ubiquity of the internet worldwide raises the stakes of genomics research on traits and behaviors, and elevates the need for enhanced precautions.²¹⁵ The free flow of information among lay people and the apparent legitimacy and authority of wide-reaching platforms on

same reasons. Therefore Louisiana’s law cannot stand under our precedents.

Id. at 2133–34.

208. *See supra* Sections I.B.1–2.

209. *See* Andrew Perrin & Madhu Kumar, *About Three-in-Ten U.S. Adults Say They Are ‘Almost Constantly’ Online*, PEW RSCH. CTR. (July 25, 2019), <https://www.pewresearch.org/fact-tank/2019/07/25/americans-going-online-almost-constantly/> [<https://perma.cc/4HAN-QQYG>].

210. *See* Escobar-Viera et al., *supra* note 13, at 2–3.

211. *See infra* Sections III.A, .C.

212. *See, e.g.*, Sarah Marsh et al., *Homophobic and Transphobic Hate Crimes Surge in England and Wales*, GUARDIAN (June 14, 2019 11:40 AM), <https://www.theguardian.com/world/2019/jun/14/homophobic-and-transphobic-hate-crimes-surge-in-england-and-wales> [<https://perma.cc/M9UG-2EWN>].

213. Escobar-Viera et al., *supra* note 13, at 2.

214. *Id.* at 1, 6.

215. *See* Perrin & Kumar, *supra* note 209.

the worldwide web can be and are used for propaganda—to distribute misinformation that appears to be authentic, breed intolerance, and spawn hatred.²¹⁶

A prime example of this is the “122 Shades of Gray” app, formerly named “How Gay Are You?” and, until recently, sold on GenePlaza.²¹⁷ GenePlaza is a direct-to-consumer genetic prediction service where customers upload their genotype data (from another platform, such as 23andMe) and receive polygenic score predictions for various traits.²¹⁸ The “How Gay Are You?” app invited users to submit genetic information to “quantify the sum of” the small effects of genetic variants identified by the recent Ganna study.²¹⁹ Despite Ganna and colleagues denying explicitly the validity of any polygenic score predictors of sexual orientation, the “How Gay Are You?” app promised to use the aggregation of genetic variants to compute one’s propensity toward a particular sexual orientation.²²⁰

When challenged, the app creator explained that he was trying to devise a fun way to use bioinformatics and strangely said, “he wanted to make [the app] ‘as outrageous as possible’ to get people to talk about the risks of genetic discrimination.”²²¹ Again, note that the app creator claimed that it was based on, or an extension of, the Ganna study.²²² One of the Ganna study authors, Benjamin Neale, stated that the app’s promotion and the claims that it made were a “gross and dangerous mischaracterization of the work.”²²³ Perhaps the most troubling fact is that the “How Gay Are You?” app’s creator resides in Uganda, where the government not only denounces but also seeks

216. LEE RAINIE, ET. AL, THE FUTURE OF FREE SPEECH, TROLLS, ANONYMITY AND FAKE NEWS ONLINE 7–8 (2017), https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2017/03/PI_2017.03.29_Social-Climate_FINAL.pdf [<https://perma.cc/8V3A-7MAE>].

217. Joel Lloyd Bellenson, *122 Shades of Gray*, GENEPLAZA, geneplaza.com/app-store/72/preview [<https://perma.cc/CN7Y-LVWV>] (last visited Nov. 5, 2020).

218. Joseph Vitti, *Remove DTC Genetic Test “How Gay Are You?” From GenePlaza Marketplace*, CHANGE.ORG, https://www.change.org/p/geneplaza-remove-dtc-genetic-test-how-gay-are-you-from-geneplaza-marketplace?use_react=false [<https://perma.cc/M77S-C6NB>] (last visited Nov. 5, 2020).

219. Bellenson, *supra* note 217; *see generally* Ganna et al., *supra* note 6.

220. *See* Ganna et al., *supra* note 6, at 4; Bellenson, *supra* note 217.

221. Diana Kwon, *Scientists Seek to Kill Genetic Test for Same-Sex Attraction*, SCIENTIST (Oct. 17, 2019), <https://www.the-scientist.com/news-opinion/scientists-seek-to-kill-genetic-test-for-same-sex-attraction--66591> [<https://perma.cc/Y8B8-V8F4>].

222. Dan Robitzski, *Scientists Call for Removal of App Claiming to Detect Gay DNA*, FUTURISM: NEOSCOPE (Oct. 17, 2019), <https://futurism.com/neoscope/scientists-against-app-detect-gay-dna> [<https://perma.cc/33E7-PXAC>].

223. *Id.*

to impose the death penalty for non-heterosexual sexual relations.²²⁴ This is a jarring example of how abuse is facilitated and will uniquely flourish via the internet.²²⁵

In this age of the internet and transcontinental travel, it is not only the citizens of the countries imposing harsh punishments for non-heterosexual conduct and transgender expression who are at risk, but any individuals who travel to these countries as well.²²⁶ In an effort to protect its users from persecution and even death, the owners of the dating app, Tinder, have designed a new feature called “Traveler Alert,” that warns users self-identifying as LGBTQ+ when they have entered a country where they are not free to be themselves.²²⁷ The alert, which also disables profile categories displaying SOGI status, is triggered by entry into sixty-nine countries, eleven of which allow the death penalty as punishment for consensual same-sex acts.²²⁸

B. Genetic screening

Back in the 1990s, there were opposing views on the supposed “gay gene.”²²⁹ Proponents of the value of finding a genetic basis for homosexuality believed that if sexual orientation was biological, this would provide proof of immutability which, in turn, would promote

224. See *supra* note 170 and accompanying text.

225. See, e.g., Kwon, *supra* note 221; Robitzski, *supra* note 222. Another concerning development is software that allegedly can determine one’s sexual orientation based on facial recognition technology. Thomas and colleagues state: “With the proliferation of social media and ease of access to facial photographs, the potential negative consequences of research in this area deserves thoughtful consideration and partnership with stakeholders.” Taylor R. Thomas et al., *Community Attitudes on Genetic Research of Gender Identity, Sexual Orientation, and Mental Health*, *Biorxiv* 2 (Sept. 10, 2019), <https://www.biorxiv.org/content/biorxiv/early/2019/09/10/685982.full.pdf> [<https://perma.cc/4NL7-MX66>] (preprint edition). “[A]lthough genetic research into human behavioral traits like sexual orientation has been proceeding for many years, it has recently accelerated, utilizing large and often publicly available data sets.” *Id.*; see also Yilun Wang & Michal Kosinski, *Deep Neural Networks Are More Accurate than Humans at Detecting Sexual Orientation from Facial Images*, 114 *J. PERSONALITY & SOC. PSYCHOL.* 246, 247–48 (2018).

226. *LGBTI Travelers*, U.S. DEP’T OF STATE — BUREAU OF CONSULAR AFFS., <https://travel.state.gov/content/travel/en/international-travel/before-you-go/travelers-with-special-considerations/lgbti.html> [<https://perma.cc/H48M-WVJC>] (Nov. 6, 2019).

227. Nadia Suleman, *Tinder’s Newest Feature Aims to Keep LGBTQ People Safer Across the World*, *TIME* (July 24, 2019, 6:14 PM), <https://time.com/5633974/tinder-lgbtq-safety-feature/> [<https://perma.cc/8ECB-E5DN>].

228. *Id.*

229. See *supra* notes 4–5, 69–72 and accompanying text.

tolerance and bolster civil rights arguments.²³⁰ There was also a belief that genetic associations for behaviors and traits would be effective ammunition against a religious fundamentalist conception that non-heterosexuality is sinful, unnatural, and an abhorrent choice.²³¹ Opponents like Futuyma warned of potential social harms.²³² Though Hamer's theory of the "gay gene" has now been debunked, these same concerns prevail today in the context of polygenic factors that may be associated with SOGI.²³³ These polygenic factors could be reinterpreted as biomedical "polygenic risk scores," a term used to assess genetic propensities to developing certain diseases.²³⁴

Current research relating to polygenic risk scores for certain mental illnesses is advancing and embryos fertilized in vitro are sometimes screened for risks of disease, including certain mental disabilities, despite the fact that the screening effectiveness has not been validated.²³⁵ The company offering that testing, Genomic Prediction, has said it expects to eventually select embryos based on intelligence and to offer that service in a country where such "soft eugenics" is not regulated.²³⁶ It is only a matter of time before such screening will be offered for sexual orientation and gender identity, whether valid and reliable, or not.²³⁷ Such screening could extend beyond the petri

230. See *supra* note 77 and accompanying text; see also *supra* Section I.B.2.

231. Sheldon et al., *supra* note 12, at 115.

232. Futuyma & Risch, *supra* note 59, at 166–67.

233. See Thomas et al., *supra* note 9, at 2.

234. See A.C. Palk et al., *Potential Use of Clinical Polygenic Risk Scores in Psychiatry - Ethical Implications and Communicating High Polygenic Risk*, PHIL. ETHICS & HUMAN MED., Feb. 27, 2019, at 6, <https://peh-med.biomedcentral.com/track/pdf/10.1186/s13010-019-0073-8> [<https://perma.cc/NBC8-CPWD>]. Even in the U.S., one could envision uses of a recruit's polygenic "gay score" by the military to obstruct enlistment (because the Genetic Information Nondiscrimination Act of 2008 Pub. L. No. 110-233, § 106, 122 Stat. 881, 905 (codified as amended in scattered sections of 42 U.S.C.) does not apply in the military setting), or by parents who want to "diagnose" their children. Taji, *supra* note 96; Yoder, *supra* note 61; see Meghann Myers, *LGBT Service Members Are Allowed to Be Out and Proud, but a Fear of Repercussions Persists*, MILITARYTIMES (June 15, 2020), <https://www.militarytimes.com/news/your-military/2020/06/15/lgbt-service-members-are-allowed-to-be-out-and-proud-but-a-fear-of-repercussions-persists/> [<https://perma.cc/KQA2-MPXV>]; see also Sheldon et al., *supra* note 12, at 116–17 (quoting J.M. Bailey & A.S. Greenberg, *Parental Selection of Children's Sexual Orientation*, 30 ARCHIVES SEXUAL BEHAV. 423 (2001)).

235. See, e.g., Sumit Mistry et al., *The Use of Polygenic Risk Scores to Identify Phenotypes Associated with Genetic Risk of Schizophrenia: Systematic Review*, 197 SCHIZOPHRENIA RSCH. 2, 2 (2018); Yoder, *supra* note 61.

236. Yoder, *supra* note 61.

237. See *id.*

dish to the termination of pregnancies where some “scientific measure” determines that the fetus is gay, or might be.²³⁸

C. Gene editing

Gene editing is another modern-day concern, one that was imaginable but impossible in 1993.²³⁹ Advances in gene editing, while unlikely to be ethically or practicably applicable to SOGI, may affect “tolerance” because what may have been thought of as innate and immutable might now be perceived as “repairable.”²⁴⁰ A genetic association for non-heterosexuality could be viewed as “a genetic anomaly, flaw, or defect that might someday be preventable or even ‘cured.’”²⁴¹ Now, with rapidly evolving gene-editing biotechnology, one could more rationally envision “genetic therapies for the ‘disorder.’”²⁴² In certain countries, perhaps even our own, it is not implausible that governments, parents, or both could legally force gene editing on those citizens and children who are SOGI minorities, or those suspected of identifying or potentially identifying as LGBTQ+.²⁴³

One commentator states that we should not be fearful that gene-editing technologies will be used to eliminate same-sex sexual behavior or that embryos will be screened for variants that might show a propensity toward same-sex sexual behavior, because it is scientifically impossible and “the genetic science of sexuality shows us that neither effort would work.”²⁴⁴ This assertion misses the point.²⁴⁵ The concern is not so much about science, but science being misappropriated and then distorted.²⁴⁶ It is not inconceivable that

238. Conrad & Angell, *supra* note 4, at 37.

239. See *CRISPR Timeline*, BROAD INST., <https://www.broadinstitute.org/what-broad/areas-focus/project-spotlight/crispr-timeline> [<https://perma.cc/WBT3-H9BB>] (last visited Nov. 5, 2020).

240. See Sheldon et al., *supra* note 12, at 113, 115–16, 139.

241. *Id.* at 116.

242. Conrad & Angell, *supra* note 4, at 37.

243. See Taji, *supra* note 96.

244. Steven M. Phelps & Robbee Wedow, *What Genetics Is Teaching Us About Sexuality*, N.Y. TIMES (Aug. 29, 2019), <http://nyti.ms/2ZyLc21> [<https://perma.cc/V9R3-VA4D>].

245. Hannah Thomasy, *Breakthrough or a Threat? Research on Genetics of Same-Sex Behavior Ignites Ethical Debate*, NAT'L POST (Dec. 6, 2019), <https://nationalpost.com/health/breakthrough-or-a-threat-research-on-genetics-of-same-sex-behaviour-ignites-ethical-debate> [<https://perma.cc/9VFV-UJMF>].

246. See Rob Stein, *Scientists Create New, More Powerful Technique to Edit Genes*, NPR (Oct. 21, 2019, 4:09 PM), <https://www.npr.org/sections/health-shots/2019/10/21/7712>

certain societies will adopt bad or inapplicable science to fit political or religious agendas.²⁴⁷

D. Scientific evidence no match for deeply entrenched beliefs

Despite all the progress and advances in science, this discipline “is unlikely to be much help in our search for rationality and justice.”²⁴⁸ Stigmatization of LGBTQ+ individuals will not be eradicated by attempts at normalizing SOGI status through science.²⁴⁹ Regardless of empirical evidence showing an association between genetic explanations and tolerance toward LGBTQ+ people,²⁵⁰ polarized viewpoints on non-heterosexuality will find reinforcement in any genetic insights emerging from new research on its etiology, because individuals select and shape information in ways that support “sociopolitical agendas most congruent with their views.”²⁵¹

“Correlational literature supports the notion that people’s reasoning about the causes of phenotypes [like sexual orientation] is often linked to their moral or social evaluations of these phenotypes.”²⁵² Those who are anti-LGBTQ+ appear more likely to view “homosexuality as a deviant lifestyle choice” than a stable, genetically based disposition.²⁵³ Culturally “controversial scientific findings” may be actively countered by narratives that allow individuals to hold onto previously held beliefs, despite contrary scientific evidence.²⁵⁴ Therefore, even if institutionalized science “naturalize[s]” the experience of being LGBTQ+, wide-reaching

66879/scientists-create-new-more-powerful-technique-to-edit-genes [https://perma.cc/QN55-YWJV].

247. See Taji, *supra* note 96. One could envision a scenario where the Ganna study’s finding of overlap in same-sex sexual behavior and mental illness—which is a correlation and not shown to be causal in either direction—could lead to the untested conclusion that there is a genetic basis for mental illness in the LGBTQ+ community. See Ganna et al., *supra* note 6, at 5. Devaluing the psychosocial effects of stigmatization, marginalization, discrimination and abuse on members in this community would reduce a sense of societal responsibility for health disparities experienced by LGBTQ+ people. See JEFF KREHELY, HOW TO CLOSE THE LGBT HEALTH DISPARITIES GAP 1, 3, 4–5 (2009), https://cdn.americanprogress.org/wp-content/uploads/issues/2009/12/pdf/lgbt_health_disparities.pdf?_ga=2.209158421.682668543.1598630536-857117675.1598630536 [https://perma.cc/KSF6-6RSW].

248. Conrad & Markens, *supra* note 73, at 382 (quoting news article).

249. See Sheldon et al., *supra* note 12, at 116.

250. *Id.*

251. *Id.* at 145.

252. Kate E. Lynch et al., *Causal Reasoning About Human Behavior Genetics: Synthesis and Future Directions*, 49 BEHAV. GENETICS 221, 231 (2018).

253. *Id.*

254. Whitehead & Baker, *supra* note 173, at 488.

acceptance should not be expected²⁵⁵: “[t]hose whose moral authority does not rest on institutional science [will] still attribute personal responsibility” to SOGI status.²⁵⁶

Therefore, while apps and social media have provided many benefits to the LGBTQ+ community,²⁵⁷ they may also be used as tools of persecution.²⁵⁸ The same may be said for preimplantation genetic screening and potential gene editing, tools normally used to help eradicate life-threatening diseases that may, instead, facilitate the elimination of certain types of people.²⁵⁹

IV. THE FUTURE OF SCIENCE: BEYOND OUR CONTROL?

Some researchers question whether genomics research with LGBTQ+ people should be pursued at all, given the potential risks to the community as a vulnerable population.²⁶⁰ Some in the LGBTQ+ community are concerned that the findings will be used as ammunition to bolster biases, and that evidence of genes being only *partially* related to same-sex sexual behavior may be employed to support beliefs that LGBTQ+ status is a choice, and conversion “therapy” is a viable and effective option.²⁶¹

Inevitably, reports on scientific studies will be inaccurate or incomplete,²⁶² leaving gaps in scientific information that may be filled in by various players, with varying agendas.²⁶³ “[N]either the scientist nor the science can control how the research is framed in the news.”²⁶⁴ Today we are globally interconnected by the internet in a

255. *Id.*

256. *Id.* at 504.

257. *See supra* note 213 and accompanying text.

258. *See* Kwon, *supra* note 221.

259. *See* Conrad & Angell, *supra* note 4, at 38.

260. Liam Spurr et al., *Opinion: Weighing the Positive and Negative Impacts of Studies Regarding Sexual Minorities*, BROAD INST.: BLOG (Aug. 29, 2019), <https://www.broadinstitute.org/blog/opinion-weighing-positive-and-negative-impacts-studies-regarding-sexual-minorities> [<https://perma.cc/RT55-8HLY>].

261. *See id.*; Belluck, *supra* note 117.

262. *See* Sheldon et al., *supra* note 12, at 132.

263. *See id.* at 132–33. Another source of distortion has surfaced in online databases where “digital culture” has “given indefinite license” to the concept of the “gay gene.” Kate O’Riordan, *The Life of the Gay Gene: From Hypothetical Genetic Marker to Social Reality*, 49 J. SEX RSCH. 362, 363 (2012).

264. Conrad & Markens, *supra* note 73, at 392.

way that we were not in 1993, and this necessitates a more expansive view when considering contexts and potential harms.²⁶⁵

The researchers in the Ganna study believed that other scientists would do this research if they did not, and as top-notch geneticists and scholars in areas including epidemiology, psychiatry and sociology, they felt an obligation to pave the way with good science and accuracy.²⁶⁶ The authors now claim that “[t]he genetic correlation analyses in [their] Research Article add to our understanding about how sexual behavior relates to health outcomes, and publicly available summary statistics from [their] GWAS may be used by other researchers to better understand genetic and environmental influences on sexual behavior, facilitating a fuller understanding of human health.”²⁶⁷ But they do not explain what the potential benefits are—other than a vague notion of progress in science—and how those outweigh potential harms.²⁶⁸

Now more than ever, it is important that researchers get this right.²⁶⁹ Not just the science, but the science in the context of a confluence of varying societal norms, government and political systems, religions, and also with an awareness of history, law, and medicine.²⁷⁰ While acknowledging that scientists should invite input from society, Benjamin Neale, one of the lead Ganna study authors, has stated that “we should not mix up trying to understand and describe the world to the best of our ability with questions of what we should and should not do to people.”²⁷¹ But is this not one of the

265. See Meagan Olive, *Opinion: Discovery or Discrimination? Starting the Conversation About the Potential Outcomes of a LGBTQIA+ Targeted Study*, BROAD INST.: BLOG (Aug. 29, 2019), <https://www.broadinstitute.org/blog/opinion-discovery-or-discrimination-starting-conversation-about-potential-outcomes-lgbtqia> [https://perma.cc/9VYD-ZD5C]. In a media-based society where readers and viewers have short attention spans, the media will take opportunities to amplify the meanings of genetics studies as they relate to social issues, and thereby misinform the public. See *id.* There is no accountability for mistakes, and no going back to correct or retract a story after it has been widely dispersed via the internet. See *id.*; WALTERS, *supra* note 71, at 94 (citations omitted).

266. Molteni, *supra* note 7.

267. Letter from Andrea Ganna et al., in response to Sarah S. Richardson et al., in *INSIGHTS: LETTERS*, 366 *SCI.* 1461, 1461 (Dec. 20, 2019).

268. See *generally id.* There has been no acknowledgment of the dangers of building a body of “scientific” knowledge on a foundation of self-reports. See *generally id.*

269. See Spurr et al., *supra* note 260.

270. See *generally id.*

271. Molteni, *supra* note 7 (quoting Neale, geneticist and Andrea Ganna’s superior at the Broad Institute in 2017).

main precepts of ethical research?²⁷² More appropriately, Thomas and colleagues urge researchers to “plan, execute, and disseminate research in a way that ensures that the basic human rights of [LGBTQ+ people] are preserved.”²⁷³ In their study, Thomas and colleagues found that community members were concerned that results of genetic research on SOGI could be easily misinterpreted, and felt strongly that it is “incumbent on researchers” not only to prepare scientific manuscripts but also takeaways easily understood by the lay public, emphasizing: “*This should not be left to chance.*”²⁷⁴

V. BORROWING FROM OTHER FRAMEWORKS

Some leaders in the science community believe there is an “informal social contract” that requires scientists, in concert with other members of society, to “do their utmost to assure that scientific discoveries are used solely to promote the common good.”²⁷⁵ Genomic research relating to behavior and traits is just now emerging, and responses to adequately govern such research affecting historically marginalized and stigmatized groups have not fully been contemplated.²⁷⁶ Over the past few years, life sciences leaders have engaged in conversation about “dual use” of life science discoveries in the national security/bioterrorism space.²⁷⁷ Ideas generated there may translate nicely to considerations involving SOGI genomics research.²⁷⁸ In this “dual use” debate (which generally has been applied to the life sciences in relation to pathogens and gene editing), some suggestions for enhanced governance include: 1) the creation of new codes of conduct and norms of responsible research; and 2) encouraging researchers to consider issues proactively, prior to commencing research projects.²⁷⁹

272. See, e.g., Thomas et al., *supra* note 9, at 12 (discussing ethical considerations for eugenics research).

273. *Id.*

274. *Id.* (emphasis added).

275. NAT'L ACADS. OF SCIS., ENG'G, & MED., *supra* note 25, at 1 (quoting INT'L COUNCIL FOR SCI., FREEDOM RESPONSIBILITY, AND UNIVERSALITY OF SCIENCE 5 (2014), <https://council.science/wp-content/uploads/2017/04/CFRS-brochure-2014.pdf> [<https://perma.cc/L629-A52P>]).

276. See *infra* notes 277–99 and accompanying text.

277. See NAT'L ACADS. OF SCIS., ENG'G, & MED., *supra* note 25, at 10. “Dual use” is a term used to describe life sciences research that is “intended to serve beneficial purposes,” but “could also be misused to cause harm.” REVILL ET AL., *supra* note 19, at 2.

278. See NAT'L ACADS. OF SCIS., ENG'G, & MED., *supra* note 25, at 10.

279. REVILL ET AL., *supra* note 19, at 4.

While not rising to the humanity-wide risks of weaponized pathogens, SOGI genomics research should be held to some sort of heightened standard, requiring more than scientific curiosity to justify particular inquiries.²⁸⁰ The heightened standard could take many forms, including more stringent or comprehensive governance.²⁸¹ Alto Charro discusses “dual use” governance, putting forth a conception of governance as an “ecosystem” in which relevant actors include “fundors of life sciences research; scientists from both academia and industry; institutions, such as universities and medical centers; journal publishers and others involved in disseminating research results; national governments; and regional and international bodies.”²⁸² Such governance would not necessarily emanate from legislative bodies or regulatory processes, but might instead manifest as self-governance among members of the scientific/academic community, learned societies, and professional organizations that would promote responsible research through education and training.²⁸³ Governance activities would begin at the conceptual or initial planning stage, continue through the funding process, the research undertaking itself, dissemination of research results, and then extend to translation.²⁸⁴

In the instance of research with marginalized populations, such as LGBTQ+ people, an important addition to the governance team would be representatives of this community.²⁸⁵ LGBTQ+ community representatives’ early and ongoing involvement in formulating research proposals and study design—in addition to their involvement in brainstorming to identify and anticipate potential risks to the community—would be appropriate measures for promoting meaningful engagement and trust.²⁸⁶ Exactly who “represents” sexual and gender minorities requires mindfulness that “LGBTQ+” includes a wide range of people; for example, a lesbian woman may not truly know and understand the concerns and experiences of a trans woman.²⁸⁷ Of paramount importance, then, is a wide representation of the LGBTQ+ community’s diversity.²⁸⁸

280. *See, e.g., id.* at 8–9.

281. *See, e.g., id.* at 7–9.

282. *Id.* at 9.

283. *Id.* at 9–10.

284. *Id.* at 10.

285. *See* Richard R. Sharp & Morris W. Foster, *Community Involvement in the Ethical Review of Genetic Research: Lessons from American Indian and Alaska Native Populations*, 110 ENV’T JUST. 145, 146 (2002).

286. *Id.* at 147.

287. *See id.*

288. *See id.* at 146.

Another framework applicable to SOGI genomics research is one used in the context of responsible research and innovation relating to neuroenhancement, which includes “anticipation, reflexivity, inclusiveness, and responsiveness [(ARIR)]”.²⁸⁹ *Anticipatory governance* requires that “actors involved in scientific and technological development collectively [attempt] to forecast the future trajectories of developments, including social, ethical, and legal aspects.”²⁹⁰ In the case of SOGI genomics research, this would require consideration of numerous contexts—both domestically and globally—such as history, law, politics, ethics, religion, and medicine.²⁹¹ *Reflexivity* requires “taking into account that all issues can have diverse and divergent framing,” and this may require the researcher “to blur the boundary between their role responsibilities and wider, moral responsibilities.”²⁹² For SOGI genomics research, this would mean serious contemplation of how results of scientific inquiry might be safe for residents of one nation and a death sentence for those in another.²⁹³ The SOGI genomics researcher has a moral and ethical duty to care about downstream uses of their findings.²⁹⁴ In addition to consulting with stakeholders, *inclusiveness* requires that researchers “attempt to invite wider society into a reasoned dialogue over a given issue or development.”²⁹⁵ In the SOGI genomics research context, this may include a duty to disseminate information and educate the public, and might also mean that there is a certain obligation to seek out the voices not only of those in the country where research is being conducted but inviting a broad array of international perspectives into the conversation.²⁹⁶ Finally, *responsiveness* refers to “how the knowledge and experiences captured in the course of public engagement activities can be made relevant to policy makers and affect policy-making processes.”²⁹⁷ In the instance of SOGI genomics research, the “policy makers” may well be a self-governing body that would elect to impose certain

289. REVILL ET AL., *supra* note 19, at 24.

290. *Id.*

291. *See id.*

292. *Id.*

293. *See supra* Section II.F.

294. *See* John A. Vucetich & Michael Paul Nelson, *The Moral Obligation of Scientists*, CHRON. HIGHER EDUC. (Aug. 1, 2010), <https://www.chronicle.com/article/the-moral-obligations-of-scientists/> [<https://perma.cc/98EV-B534>].

295. REVILL ET AL., *supra* note 19, at 24.

296. *See id.*

297. *Id.*

restrictions on particular types of research.²⁹⁸ Clearly, this is a tall order, but ARIR may provide a pathway to responsible research on SOGI genomics.²⁹⁹

CONCLUSION

It is important to distinguish between research on the genetic bases of SOGI, and research identifying disparities in how LGBTQ+ people may be underserved or neglected in the provision of medical care and services for genetic diseases.³⁰⁰ The latter, without a doubt, is essential to achieving health care equity for LGBTQ+ people.³⁰¹ The benefits of pursuing the former are not as straightforward.³⁰² In pursuing genomics research on sexual orientation and gender identity, researchers must adopt a more global perspective on how their science may be misused and misinterpreted to fit evil agendas.³⁰³ This “dual use” repurposing should be considered in deciding what to study, how to study it, and how to advance science without potentially serving up on a platter “tools for persecution” to those who may aim to rid the world of LGBTQ+ people.³⁰⁴

Part of responsible science in this space may require researchers who publish on sexual orientation or gender identity genomics to educate the public broadly about their findings, so the average layperson will be able to recognize misrepresentations of the science.³⁰⁵ Some suggest that dissemination of information to the public should occur along a spectrum, not beginning at the time of publication but much earlier, during idea generation.³⁰⁶ Public communication and engagement could include contributions in determining purposes and objective-setting, as well as study planning and implementation.³⁰⁷ Perhaps stakeholder advisory boards should become the norm when participants are exclusively members of a

298. *See id.* The experiences of Native American tribal nations and other indigenous populations in oversight of research in their communities could provide an additional framework for how this may be done. *See Sharp & Foster, supra* note 285, at 146–47; *see* Nanibaa A. Garrison et al., *Access and Management: Indigenous Perspectives on Genomic Data Sharing*, 29 *ETHNICITY & DISEASE* 659, 661 (2019).

299. REVILL ET AL., *supra* note 19, at 24.

300. *See supra* Section II.C; *supra* note 160 and accompanying text.

301. *See supra* notes 2, 160 and accompanying text.

302. *See supra* notes 208–12 and accompanying text.

303. *See supra* notes 290–96 and accompanying text.

304. *See supra* notes 277–84 and accompanying text.

305. *See* Thomas et al., *supra* note 9, at 12.

306. *See* NAT'L ACADS. OF SCIS., ENG'G, & MED., *supra* note 25, at 2.

307. *See* Sharp & Foster, *supra* note 285, at 146–47.

vulnerable population.³⁰⁸ Another proposal is to revisit federal research regulations in order to address large-scale genetics studies based on aggregated data, a type of research that may not harm an individual participant, but that could have detrimental effects on a vulnerable community.³⁰⁹ The term for this phenomenon is “bystander risk.”³¹⁰ Researchers must consider contexts, and new regulations or guidance might provide instructions on best practices for doing so.³¹¹

There may be beneficial uses for SOGI genomics research, and these uses should be welcomed and supported.³¹² Under certain circumstances, however, stakeholder consensus might lead to a determination that the most ethical course of action is *not* doing research, for example, where the proposed research effectively “others” the LGBTQ+ community, poses an increased threat of danger to the community, or medicalizes SOGI minority status in ways objectionable to the community.³¹³ Researchers should be receptive and responsive to such concerns. Some scholars suggest that there may be “a moral imperative in conducting and reviewing research” to protect “identifiable communities from research-related harm.”³¹⁴ Researchers may also have a moral duty to advocate for

308. See Molteni, *supra* note 7.

309. See *id.*

310. *Id.* According to Bioethicist Holly Lynch, “This falls totally outside the regulatory systems we have. It really is a new problem that we haven’t given enough attention to.” *Id.*

311. See Garrison et al., *supra* note 298, at 659–61.

312. See *supra* notes 77, 121–22, 131 and accompanying text.

313. See NAT’L ACADS. OF SCIS., ENG’G, & MED., *supra* note 25, at 45; see *supra* Sections II.C–F.

314. Sharp & Foster, *supra* note 285, at 146 (citing C. Weijer, *Protecting Communities in Research: Philosophical and Pragmatic Challenges*, 8 CAMBRIDGE Q. HEALTHCARE ETHICS 501, 506 (1999)). In 1999, the National Bioethics Advisory Commission recommended that regulatory oversight of human subjects research protections be extended beyond the individual to include social groups. See *id.* at 145. Still, the individual research subject remains the focus of human subjects research regulation in the U.S. See generally DEP’T OF HEALTH AND HUM. SERV., RESPONSE OF THE DEP’T OF HEALTH AND HUM. SERV. TO NBAC’S REP., RSCH. INVOLVING HUM. BIOLOGICAL MATERIALS: ETHICAL ISSUES AND POL’Y GUIDANCE 26–27 (2001), <https://aspe.hhs.gov/system/files/pdf/72816/hbm.pdf> [<https://perma.cc/RS85-XUJ5>]. See also Daniel M. Hausman, *Third-Party Risks in Research: Should IRBs Address Them?*, 29 IRB: ETHICS & HUM. RSCH. 1, 1, 5 (2007) (arguing that “[t]he harms that research may cause to third parties either in its conduct or via its findings are serious enough to warrant protections” and “there is a serious need for protections to third parties that help secure the benefits of research while adhering to democratic norms and the requirements of distributive justice.”); see also Daniel M. Hausman, *Group Risks*,

and support anti-discrimination laws that would protect LGBTQ+ people and, as a result, reduce the risks of SOGI genomics research.³¹⁵

Based on information available in the literature, it appears that SOGI genomics research specifically focused on the benefit of ameliorating discriminatory beliefs will not sufficiently outweigh risks that may be heightened by the research itself.³¹⁶ An appeal to scientific bases for a human trait or characteristic in order to promote tolerance or placate hate and fear has limited probability of effecting real change.³¹⁷ And such an approach implicitly states that LGBTQ+ community members owe everyone else in the world an explanation.³¹⁸ They do not.

SOGI genomics research should be subject to governance that will set the bar higher than what is generally expected of the researcher and research.³¹⁹ It is imperative that we remain cognizant of the reality that certain types of research, due to history and context, require more thoughtfulness and care than others.³²⁰

Risks to Groups, and Group Engagement in Genetics Research, 17 KENNEDY INST. ETHICS J. 351, 352 (2007) (“Protecting groups from the perils of genetics research raises deeper and more complicated problems than protecting research subjects and third parties from process-related risks”).

315. See Vucetich & Nelson, *supra* note 294.

316. See *supra* notes 249–56 and accompanying text.

317. See Whitehead & Baker, *supra* note 173, at 490.

318. See Sheldon et al., *supra* note 12, at 115–16.

319. See *supra* notes 280–84 and accompanying text.

320. See *supra* notes 269–73 and accompanying text.