

WOULD YOU LIKE BLUE EYES WITH THAT? A FUNDAMENTAL RIGHT TO GENETIC MODIFICATION OF EMBRYOS

Tandice Ossareh*

The Constitution has long protected the rights of individuals to procreate and parent, free from government intrusion. But as new technologies stretch the boundaries of what it means to create a family, the scope of these rights have come into question. Specifically, modern advances in genetic modification will soon allow parents to make direct modifications to particular embryos. The possibility of such advances gives rise to questions about how to regulate the making of “designer babies.” This Note argues the right to access genetic modification technology falls squarely within the framework established by the existing line of cases extending to individuals the right to build their families in a meaningful way, on their own terms, without government interference. Anticipating state regulation limiting access to these new technologies, this Note finds the Supreme Court would likely have to strike down such regulations as violating the Due Process Clause. As such, parents should have a protected right to make at least therapeutic modifications to restore the health of an embryo, if not enhancement modifications to enhance particular traits of the future child. Resting at the salient intersection of parental and procreative autonomy, this Note seeks to delineate the exact parameters of a cognizable right to genetic modification.

INTRODUCTION

Soon, parents may be able to choose. Some will prioritize appearance; others intelligence; others still athleticism, humor, or disposition. Advancements in genetic technology have already enabled doctors to determine the sex, hair color, eye color, and height of embryos.¹ Today, new technologies allow direct modification of singular embryos, meaning parents can alter the genes of an embryo to reflect certain desired qualities.² The United Kingdom has recently legalized the use of one

* J.D. Candidate 2017, Columbia Law School.

1. Elyse Whitney Grant, Note, Assessing the Constitutionality of Reproductive Technologies Regulation: A Bioethical Approach, 61 Hastings L.J. 997, 1004 (2010).

2. See Ellie Zolfagharaifar, Richard Gray & Ben Spencer, Scientists Genetically Modify Human Embryos for the First Time: Controversial Technique Could Lead to Designer Babies, Daily Mail (Apr. 22, 2015, 18:57 EST), <http://www.dailymail.co.uk/sciencetech/article-3051365/Scientists-tweak-genes-human-embryos-time-Controversial-technique-lead-designer-babies.html> [http://perma.cc/57FB-7C7J] (last updated Apr. 23, 2015, 20:36 EST) (reporting scientists in China succeeded for the first time in modifying an embryo gene connected to a blood disorder using CRISPR/Cas9 technology).

such technology, mitochondrial donation,³ spurring discussion within the Food and Drug Administration (FDA) regarding the permissibility of research in this field.⁴ While offerings like embryo sex selection have been widely unregulated in the United States to date,⁵ it is likely that as the array of selections expands and becomes more controversial, the nation will have to confront the permissibility of technologies that facilitate the creation of what critics have called “designer babies.”⁶

Some have welcomed the advent of this technology, but others are skeptical, even fearful, of the consequences. This Note addresses why fears regarding genetic modification are not only unjustified in most cases but also repugnant to the reproductive and parental rights entrenched in this nation’s fundamental rights jurisprudence. The Note focuses specifically on recent technologies that modify singular embryos, arguing that the right to access these technologies falls squarely within the existing array of reproductive and parental rights established by the Supreme Court.⁷ This right is not new but rather is justified by the constitutional guarantee that no state will deprive any person of “life, liberty, or property, without due process of law.”⁸

A right to genetic modification of embryos exists at a unique intersection, drawing heavily upon both procreative and parental rights to establish legitimacy. Nesting access to these technologies within currently recognized fundamental rights, this Note argues that an expansive reading of the Court’s decisions justifies judicial protection of genetic modifi-

3. The Human Fertilisation and Embryology (Mitochondrial Donations) Regulations 2015, SI 2015/572 (UK), http://www.legislation.gov.uk/uksi/2015/572/pdfs/uksi_20150572_en.pdf [<http://perma.cc/YW4Q-CY8N>] [hereinafter Human Fertilisation and Embryology Regulations] (legalizing embryo modification that replaces the mitochondrial gene with that of a third party in order to prevent mitochondrial disease).

4. See Cellular, Tissue & Gene Therapies Advisory Comm., FDA, Oocyte Modification in Assisted Reproduction for the Prevention of Transmission of Mitochondrial Disease or Treatment of Infertility 15–19 (Feb. 25–26, 2014) [hereinafter Oocyte Modification Briefing Document], <http://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/BloodVaccinesandOtherBiologics/CellularTissueandGeneTherapies/AdvisoryCommittee/UCM385461.pdf> (on file with the *Columbia Law Review*) (considering the safety of mitochondrial manipulation technologies).

5. Nicole Baffi, Comment, *The Good, the Bad, and the Healthy: How Spindle-Chromosomal Complex Transfer Can Improve the Future*, 74 Alb. L. Rev. 361, 367 (2010/2011) (“Currently, there are no specific federal or state regulations governing attempts to genetically modify gametes”). But see infra notes 118–119 and accompanying text (acknowledging some regulation does exist in the area of sex-selection abortion statutes).

6. Mike Steere, *Designer Babies: Creating the Perfect Child*, CNN (Oct. 30, 2008, 10:38 AM), <http://www.cnn.com/2008/TECH/science/10/30/designer.babies/index.html?iref=24hours> [<http://perma.cc/AM89-UQSE>].

7. See John A. Robertson, *Genetic Selection of Offspring Characteristics*, 76 B.U. L. Rev. 421, 422 (1996) [hereinafter Robertson, Genetic Selection] (“[P]rinciples of reproductive freedom and family autonomy appear to support a presumptive liberty right to obtain and use genetic information in making reproductive decisions.”).

8. U.S. Const. amend. V; id. amend. XIV, § 1.

cation as a privacy right to make decisions central to procreation and to parenting. A discussion of whether genetic modification is morally good or ethical is beyond the scope of this Note—this is not the relevant legal question at hand. Rather, this Note finds that from a *legal* perspective, states cannot justify restricting the right to genetic modification based on existing jurisprudence.

Part I of this Note begins with an overview of more familiar reproductive technologies and their regulation domestically and abroad. This Part then provides an extensive background on the development of reproductive and parental rights throughout the Court's history. Part II introduces recent and emerging reproductive technologies and the limitations states may seek to impose on them. In Part III, the Note introduces a fundamental rights analysis as the proper legal framework to address such limitations and establishes the judicial system as the proper avenue to legitimize access to genetic-modification technologies. This Part also considers the outer limits of this right and addresses the countervailing interests at play. Ultimately, this Note concludes it is probable that the Court will soon be confronted with the question of whether there is a procreative and parental right encompassing genetic modification,⁹ and it should respond by establishing access to this technology as fundamental while also carefully considering the exact parameters of such access.

I. REPRODUCTIVE TECHNOLOGY AND FUNDAMENTAL RIGHTS DOCTRINE

Reproductive technologies have empowered hopeful parents to make choices about when and how to reproduce.¹⁰ While rights surrounding procreation and parenting have traditionally been protected, the exact scope of these rights remains vague¹¹ and their strength ambiguous.¹² This Part explores the array of existing reproductive technologies and the breadth of the prevailing fundamental rights doctrine on parental and procreative autonomy. Section I.A provides background on reproductive technologies that both facilitate procreation and allow parents to

9. See *infra* section II.B.2 (discussing the strong potential for litigation in response to state action).

10. See Grant, *supra* note 1, at 1007 (noting such technologies “implicate the parental decision of whether to have a particular child, a decision which remains distinct from the broader question of whether to have a child” (emphasis omitted)).

11. See Andrew B. Coan, *Is There a Constitutional Right to Select the Genes of One's Offspring?*, 63 Hastings L.J. 233, 238 (2011) (“The scope of the constitutional right to procreative liberty and the extent of its application to genetic-selection decisions is, in a nutshell, unclear.”).

12. See Mariama A. Jefferson, *Note, Reproductive Choice: The Reproductive Choice Debate Must Include More than Abortion*, 4 Charleston L. Rev. 773, 788 (2010) (“[T]he *Roe* Court provided an exceptionally narrow view of privacy.”).

make specific procreative choices about their future offspring.¹³ Section I.B then presents a comprehensive exegesis of fundamental rights doctrine—and its limits—as it pertains to parental rights and procreative autonomy. This Part provides the context necessary to later consider the concerns that may arise as new reproductive technologies afford greater control over the embryo-modification process.

A. *Modern Reproductive Technologies and Their Regulation*

This section reviews the reproductive technologies that are most commonly used today as well as their regulation domestically and abroad. The current scientific and regulatory landscape of reproductive technologies sets the scene for the advent of the new, riskier technologies that raise myriad ethical and legal issues discussed in Part II. As hopeful parents have come to rely on the availability of these technologies in making choices about what kind of child to have, it becomes particularly difficult to justify denying access to these technologies' successors.¹⁴

1. *Commonly Used Reproductive Technologies.* — Beyond the use of contraception to exercise the right not to procreate, reproductive technology allows parents to “bear or beget a child” in the face of medical complications.¹⁵ Broadly referred to as Assisted Reproductive Technologies (ARTs),¹⁶ these technologies fall primarily into two categories: those pertaining to prenatal genetic testing and those relating to preimplantation genetic diagnosis (PGD).¹⁷

Prenatal genetic testing is practiced on an in utero fetus, offering one of two major tests: (1) chorionic villus sampling, which detects medical issues such as Down syndrome and cystic fibrosis, and (2) first-trimester screening, a blood sample test that allows parents to identify the likelihood of chromosomal abnormalities like Down syndrome and Trisomy-18.¹⁸

13. This Note will refer to the procreative rights of parents throughout. While the procreative right alone refers to both individuals and couples, see *Eisenstadt v. Baird*, 405 U.S. 438, 453 (1972) (“If the right of privacy means anything, it is the right of the *individual*, married or single, to be free from unwarranted governmental intrusion . . .”), this Note refers to parents only to emphasize that the procreative right is also bolstered by the right of parental autonomy. In referring to parents, this Note means those seeking to procreate and raise a child, whether alone, in a married couple, in an unmarried couple, or in another familial configuration of their choosing.

14. See *infra* section III.B.1 (arguing existing technologies could be seen as part of the historical rooting necessary to deem access to emerging technologies as fundamental).

15. See *Eisenstadt*, 405 U.S. at 453.

16. Girard Kelly, Comment, Choosing the Genetics of Our Children: Options for Framing Public Policy, 30 Santa Clara High Tech. L.J. 303, 307 (2014).

17. See Grant, *supra* note 1, at 1003–06.

18. *Id.* at 1005. In the second trimester, the process of amniocentesis allows the testing of amniotic fluids for similar disorders. President’s Council on Bioethics, Reproduction and Responsibility: The Regulation of New Biotechnologies 89 (2004) [hereinafter Reproduction and Responsibility], <http://repository.library.georgetown.edu/bitstream/>

Parents may choose to terminate a pregnancy if dissatisfied with the outcome of the test.¹⁹

PGD, on the other hand, is performed in conjunction with in vitro fertilization (IVF): Embryos are tested for genetic disorders *before* being implanted into the woman's uterus, allowing parents to preemptively assess the health of their embryo.²⁰ This technology has now been available for over twenty-five years.²¹ A related preimplantation technology allows for sex selection through sperm separation, which currently predicts the child's gender with an estimated 86% success rate.²²

Using reproductive technologies to assist and control the procreative process has proved quite popular: Overall, it is estimated that the "baby-making" business is a \$6.5 billion industry.²³ While PGD relies on the use of IVF, which is typically thought of as reserved for couples having difficulty conceiving, at least one-third of individuals using PGD are otherwise fertile,²⁴ and over 1% of all U.S. newborns are conceived through IVF.²⁵ Of clinics that offer PGD, 42% have used the technology to allow couples to choose the sex of the child, 24% have used it to select an embryo that is an immunological match with an existing sick child, and 3% have used it to select *for* a disability common to the parent, like deafness or dwarfism.²⁶ Studies on the use of in utero diagnostic tools in the United States and Europe show that a majority of parents who learn their child will have a serious illness choose to terminate the pregnancy.²⁷

handle/10822/559381/_pcbe_final_reproduction_and_responsibility.pdf [http://perma.cc/2G27-3LFD].

19. Grant, *supra* note 1, at 1006.

20. See, e.g., *id.* at 1004 ("PGD provides a means for IVF participants to avoid genetic conditions like Tay-Sachs disease, cystic fibrosis, sickle cell anemia, Huntington's disease, and others."). A corollary to PGD is preimplantation genetic screening, using the same technology to test for a "broader spectrum of genetic characteristics . . . including sex, hair color, eye color, skin color, height, and breast cancer predisposition." *Id.* PGD itself involves extracting and fertilizing eggs through IVF, waiting for the fertilized eggs to reach the "six-to-eight-cell stage," and then removing one or two cells for analysis. See *Reproduction and Responsibility*, *supra* note 18, at 91.

21. See Bratislav Stankovic, "It's A Designer Baby!": Opinions on Regulation of Preimplantation Genetic Diagnosis, 9 UCLA J.L. & Tech., 2005, at 1, 3 (noting over ten years ago that the technology had been available for fifteen years).

22. Kelly M. Plummer, Comment, Ending Parents' Unlimited Power to Choose: Legislation Is Necessary to Prohibit Parents' Selection of Their Children's Sex and Characteristics, 47 St. Louis U. L.J. 517, 522 (2003).

23. Sandra T. Jimenez, Note, "My Body, My Right": A Look into IVF Regulation Through the Abortion Legal Framework, 33 Women's Rts. L. Rep. 375, 383 (2012).

24. *Reproduction and Responsibility*, *supra* note 18, at 90.

25. Susannah Baruch, Preimplantation Genetic Diagnosis and Parental Preferences: Beyond Deadly Disease, 8 Hous. J. Health L. & Pol'y 245, 248 (2008).

26. Grant, *supra* note 1, at 1004–05.

27. See Greer Donley, Note, Does the Constitution Protect Abortions Based on Fetal Anomaly?: Examining the Potential for Disability-Selective Abortion Bans in the Age of Prenatal Whole Genome Sequencing, 20 Mich. J. Gender & L. 291, 296 (2013) (noting

These numbers serve as a reflection of parents' active interest in shaping the life path of their future child.²⁸ Still, a distinction remains between medical and cosmetic selections. No clinic currently offers eye color, hair color, or skin color selection, though the technology is available. For example, Fertility Institutes, an ART clinic in Los Angeles, advertised these services in 2009 before withdrawing due to "an outpouring of opposition."²⁹ While there may be discomfort surrounding the selection of embryos based on cosmetic traits, there is at least an intuition that *medical* choices at the preimplantation level should be permissible.

2. *Domestic Regulation.* — Currently, there is almost no state or federal regulation of the use of the above technologies in the United States.³⁰ Regulating reproductive technologies would seem to fall primarily within the purview of the states under their police power, vested in the state legislature, which gives governing power to states to protect the health, safety, and general welfare of their residents.³¹ Though some states have implemented regulations, such as abortion bans on the basis of disability or sex selection,³² most state regulation is limited and variable among states.³³

92–93% of parents who learn their child will have Down syndrome terminate the pregnancy, while 61–67% will terminate for spina bifida, 69–75% for Turner syndrome, and 82–86% for anencephaly.

28. For example, while only 49% of Americans identified as prochoice in 2007, in the same year, 70% "believed women should be permitted to obtain an abortion 'if there is a strong chance of a serious defect in the baby.'" *Id.* (quoting Amy Harmon, *Genetic Testing + Abortion = ???*, N.Y. Times (May 13, 2007), <http://www.nytimes.com/2007/05/13/weekinreview/13harm.html> (on file with the *Columbia Law Review*)).

29. Jessica Knouse, *Reconciling Liberty and Equality in the Debate over Preimplantation Genetic Diagnosis*, 2013 Utah L. Rev. 107, 127. Note that this withdrawal was triggered not by any legal obligation or regulation but rather simply by public disapproval.

30. See *id.* at 125 (noting these technologies "are governed by very little beyond internal self-regulatory decisions" in the United States); Jennifer L. Rosato, *The Children of ART (Assisted Reproductive Technology): Should the Law Protect Them from Harm?*, 2004 Utah L. Rev. 57, 62 ("In the United States, reproduction proceeds virtually unregulated, as it has for the past twenty-five years. Federal regulation does not control ART in any meaningful way, and state intervention is limited.").

31. See generally Santiago Legarre, *The Historical Background of the Police Power*, 9 U. Pa. J. Const. L. 745 (2007) (giving a general overview of the state police power, including its role in regulating public health); see also *infra* notes 110–112 and accompanying text (describing the states' police power and the limited role for federal intervention when the matter is predominantly within the purview of the states, such as with public health and welfare).

32. For a discussion of state statutes that may infringe upon the procreative right, such as those that ban abortions performed based on the sex or disability of the fetus, see *infra* section II.B.

33. See Rosato, *supra* note 30, at 64 (noting most state regulation focuses on particular technologies such as surrogacy and sperm donation, as opposed to the systematic and broad regulation of ARTs).

Generally, “the law has steered clear of interfering with the practices of assisted reproduction.”³⁴

Where state and federal legislative action has been limited to nonexistent, regulatory agencies have not played a much more meaningful role.³⁵ The FDA and the National Institute of Health’s (NIH’s) Recombinant DNA Advisory Committee (RAC) are the institutions in this area with the most relevant expertise.³⁶ However, in 1996, Congress passed the Dickey-Wicker Amendment, diluting the NIH’s relevance in this area by banning the NIH from “using appropriated federal government funds to create human embryos for research, or from conducting research in which human embryos are destroyed or ‘knowingly subjected to risk of injury or death.’”³⁷ The FDA focuses on safety regulation, as opposed to research, and is responsible for the “oversight and regulation of human genetic engineering.”³⁸ The FDA regulates the safety of “biologics” and “medical devices,”³⁹ meaning broad regulation of reproductive technologies would fall more neatly under the FDA’s purview. Still, ARTs are not quite biologics (such as gene therapy products or tissue), nor are they exactly medical

34. Id. at 65. Though there is no one explanation for this hands-off approach, Professor Jennifer Rosato suggests that these piecemeal state regulations, coupled with “more generally applicable laws,” have filled the gaps for now. Id. at 64–65.

35. For example, while the Centers for Disease Control and Prevention (CDC) requires IVF clinics to report some data, including pregnancy success rates, the clinics are not required to divulge in what ways they are using PGD in conjunction with IVF. Knouse, *supra* note 29, at 126; see also Rosato, *supra* note 30, at 63 (describing the CDC’s IVF reporting requirements under the 1992 Fertility Clinic Success Rate and Certification Act).

36. See Baffi, *supra* note 5, at 368–69 (discussing the regulatory roles of these institutions in overseeing research involving gene therapy). Established in 1974, the RAC was meant to oversee research in recombinant DNA techniques. Id. In 1985, the committee was expanded to oversee experiments in “human gene therapy and genetic engineering,” though the NIH’s oversight is limited to those institutions to which it provides funding. Id.; see also Sarah M. Markwood, Comment, Creating a Perfect Human Is Not So Perfect: The Case for Restricting Genetic Enhancement Research, 110 Penn St. L. Rev. 473, 479 (2005) (“The restriction by the RAC does not altogether ban germ-line engineering research; instead, the research must be conducted through private funds.”).

37. Sara I. Salehi, *Do Embryos Have Constitutional Rights?: Doe v. Obama*, 63 S.C. L. Rev. 1091, 1091 (2012) (quoting *Doe v. Obama*, 670 F. Supp. 2d 435, 437 (D. Md. 2009), aff’d, 631 F.3d 157 (4th Cir. 2011)). However, President Barack Obama’s 2009 Executive Order 13,505 allowed the NIH to “support and conduct responsible, scientifically worthy human stem cell research to the extent permitted by law.” Id. at 1092 (quoting Exec. Order No. 13,505, 3 C.F.R. §§ 229, 230 (2009)). Though not overturning the Dickey-Wicker Amendment, the order seemed to move toward a more liberal standard for embryo research. Id.

38. Baffi, *supra* note 5, at 369. Within the FDA’s purview is the evaluation of gene transfer therapy and technologies involving human cells and tissues for safety and efficacy. Id. at 369–70.

39. What Does FDA Regulate?, FDA, <http://www.fda.gov/AboutFDA/Transparency/Basics/ucm194879.htm> [<http://perma.cc/A7KP-5MQG>] (last updated Jan. 17, 2017) (providing a list of the general categories of FDA regulation).

devices,⁴⁰ so it is not clear that the FDA would have full regulatory authority. Further, the FDA's role is to regulate products for safety, not moral and legal legitimacy,⁴¹ making it an imperfect fit as a regulatory body for these technologies.

Thus, there is currently no clear body to comprehensively regulate the development and use of these reproductive technologies. Whether these technologies are a source of apprehension and confusion for the legal community or whether they have simply not risen to the level of consciousness in the minds of legislators and regulators,⁴² the law's silence leaves access to these technologies unprotected and vulnerable.⁴³

3. *International Regulation.* — One clue that points to the potential for future restrictive regulation on either the state or federal level is the treatment of access to ARTs abroad. As a response to fears of eugenics reminiscent of the Nazi regime, Germany has outlawed the use of PGD altogether.⁴⁴ Germany's Embryo Protection Law of 1991 mandates a five-year prison sentence for any use of germ-line manipulations.⁴⁵ Austria and Italy have also banned the use of PGD.⁴⁶ Countries such as Hungary, Costa Rica, and Ecuador have deemed that embryos have a right to life,⁴⁷ which limits parents' ability to select among embryos and discard the remaining embryos. Other countries have allowed PGD under narrowly defined circumstances. The United Kingdom, for example, established the Human Fertilisation and Embryology Authority (HFEA) to supervise PGD use.⁴⁸ While not every nation has such regulations,⁴⁹ these models

40. Id. (providing examples of "biologics" such as blood, tissue, and vaccines and examples of "medical devices" such as pacemakers, dental devices, and prosthetics).

41. See Rosato, *supra* note 30, at 88 ("FDA regulation would not be recommended because the FDA's primary concerns are the safety and efficacy of a product, which do not relate to broad ethical issues as a matter of course.").

42. See Benjamin B. Williams, Note, *Screening for Children: Choice and Chance in the "Wild West" of Reproductive Medicine*, 79 Geo. Wash. L. Rev. 1305, 1306 (2011) (noting the United States has "somewhat mysteriously" not regulated preimplantation genetic screenings).

43. See *infra* section II.B (arguing the lack of regulation leaves room for potentially restrictive state action).

44. Lindsey A. Vacco, Comment, *Preimplantation Genetic Diagnosis: From Preventing Genetic Disease to Customizing Children. Can the Technology Be Regulated Based on the Parents' Intent?*, 49 St. Louis U. L.J. 1181, 1206 (2005).

45. Markwood, *supra* note 36, at 479.

46. Michael Gortakowski, *A Parent's Choice v. Governmental Regulations: A Bioethical Analysis in an Era of Preimplantation Genetic Diagnosis*, 29 Buff. Pub. Int. L.J. 85, 98 (2011).

47. Markwood, *supra* note 36, at 478–79.

48. Gortakowski, *supra* note 46, at 98–99 (noting the specific circumstances of use in countries such as France, Denmark, Norway, New Zealand, Japan, Canada, the Netherlands, and Australia and noting England requires clinics to obtain HFEA licenses to perform PGD).

49. See Aaron R. Fahrenkrog, Note, *A Comparison of International Regulation of Preimplantation Genetic Diagnosis and a Regulatory Suggestion for the United States*, 15 Transnat'l L. & Contemp. Probs. 757, 768 (2006) (noting some countries, including the United States, do not regulate the use of PGD).

serve as a reminder that the current unregulated landscape is not guaranteed to continue, especially as lawmakers could point to examples of peer nations' policies to support arguments for stricter regulation.⁵⁰ For now, the limited, piecemeal regulation in this area sets the stage for potential state interference, as discussed in Part II.

B. Fundamental Rights Doctrine and Relevant Case Law

This section lays out the evolution of fundamental rights jurisprudence regarding parental and procreative rights. These two lines of cases will serve as the justification for an assertion of a fundamental right to genetic modification⁵¹ taken up in Part III. This section first discusses the right to parental autonomy and its limits and goes on to discuss the right to procreative autonomy and its narrowing in the abortion context. This expansive bundle of procreative and parental rights, related to marriage, procreation, contraception, child-rearing, and beyond, should ultimately support less familiar exercises of parental and procreative authority, namely, the use of genetic modification.

1. *Parental Autonomy*. — The Court has long upheld the right of parents to make decisions regarding the upbringing of their children. Beginning in 1923, the Court in *Meyer v. Nebraska* held that a state statute banning the teaching of a foreign language other than English before students reached the eighth grade violated the Due Process Clause of the Fourteenth Amendment.⁵² The Court found that the due process right “denotes not merely freedom from bodily restraint but also the right of the individual to . . . marry, establish a home and bring up children, . . . and generally to enjoy those privileges long recognized at common law as essential to the orderly pursuit of happiness by free men.”⁵³ The Court later shot down a statute compelling parents to send their children to public school, as opposed to private school, until the age of sixteen.⁵⁴ Looking to *Meyer*, the Court in *Pierce v. Society of Sisters* found the statute “unreasonably interfere[d] with the liberty of parents and guardians to direct the upbringing and education of children under their control” when the statute “ha[d] no reasonable relation to some purpose within

50. For an example of legislators' consideration of an issue's treatment abroad, see *Washington v. Glucksberg*, 521 U.S. 702, 734 (2007) (referencing a study of euthanasia in the Netherlands used by the New York Task Force in determining the risk of euthanasia). Though this led the state to the opposite conclusion as the Dutch, it shows legal determinations do not operate in a bubble.

51. Jason C. Glahn, I Teach You the Superman: Why Congress Cannot Constitutionally Prohibit Genetic Modification, 25 Whittier L. Rev. 409, 427 (2003) (noting these cases could “serve as a possible basis for the defense of genetic modification as a fundamental right”).

52. See 262 U.S. 390, 402–03 (1923).

53. Id. at 399.

54. *Pierce v. Soc'y of Sisters*, 268 U.S. 510, 534–35 (1925).

the competency of the state.”⁵⁵ More recently, in *Wisconsin v. Yoder*, the Court held that the First and Fourteenth Amendments invalidated a state statute compelling Amish students to attend high school until age sixteen.⁵⁶

Through these cases, the Court announced the expansive right of parents to direct their child’s upbringing.⁵⁷ The right to “prepare [a child] for additional obligations”⁵⁸ awards parents the autonomy to decide what additional obligations exist. In *Yoder*, Amish parents were free to determine that the scope of these obligations included abandoning education to “acquire Amish attitudes favoring manual work and self-reliance and the specific skills needed to perform the adult role of an Amish farmer or housewife.”⁵⁹ This is no small decision—it is a choice that seeks to not only limit the education of the child but also likely determine the future careers available to the child, bound by arguably dated gender norms. *Yoder* thus serves as a seminal example of the great latitude the Court affords to parents.

Still, the Court acknowledges that this right is not unlimited.⁶⁰ In *Prince v. Massachusetts*, the Court balanced a mother’s freedom of religious practice and authority “in the rearing of her children” against the state’s interest in protecting the child, ultimately finding in favor of the state and noting that “the family itself is not beyond regulation.”⁶¹ The outcome could depend, then, upon whether the Court brands a certain activity as one which requires state protection. However, *Prince* precedes *Yoder*, boding in favor of the conclusion that the Court has moved toward

55. Id. Even under this lenient “reasonable relation” standard, the state statute did not pass muster.

56. 406 U.S. 205, 233–34 (1972). The Court went on to note: “The history and culture of Western civilization reflect a strong tradition of parental concern for the nurture and upbringing of their children. This primary role of the parents in the upbringing of their children is now established beyond debate as an enduring American tradition.” Id. at 232.

57. While *Meyer* and *Pierce* were decided in the *Lochner* era, which came to an end with *West Coast Hotel Co. v Parrish*, 300 U.S. 379, 398–400 (upholding the constitutionality of a minimum wage for women and minors), *Yoder* affirms that these decisions remain relevant in the post-*Lochner* era by reaffirming their central holdings. See Alexander Lutz, Comment, Constitutional Parental Rights and the Childhood Obesity Epidemic, 3 Wake Forest J.L. & Pol'y 211, 218–19 (2013).

58. *Pierce*, 268 U.S. at 535.

59. *Yoder*, 406 U.S. at 211.

60. Id. at 233–34 (“[T]he power of the parent . . . may be subject to limitation . . . if it appears that parental decisions will jeopardize the health or safety of the child, or have a potential for significant social burdens.”).

61. 321 U.S. 158, 165–66, 170 (1944) (holding the Jehovah’s Witness mother allowing her children to preach with her on the streets violated Massachusetts’s child labor laws and was not entitled to constitutional protection). *Prince* ultimately seems difficult to reconcile with an otherwise seemingly broad parental right. Though an Amish family may pull their child out of school to work within the community, a Jehovah’s Witness mother may not direct her child to engage in street preaching.

granting broad parental discretion in making decisions that affect the future paths of their offspring.⁶² Thus, the Due Process Clause provides constitutional protection for parents against laws that significantly interfere with their ability to exercise their parental autonomy.

2. *Courts' Treatment of Parental Medical Decisions.* — Though the Court's jurisprudence has established a relatively expansive parental right, a "significant exception" exists with regard to the preservation of a child's health.⁶³ In *Parham v. J.R.*, where parents sought to admit minor children into psychiatric hospitals, the Court emphasized that "a state is not without constitutional control over parental discretion in dealing with children when their physical or mental health is jeopardized."⁶⁴ The balance is thus undoubtedly delicate: While parental control over medical decisions is not absolute in every case, it is still presumptively substantial.

The plot thickens in the prenatal realm. Where a parent is making decisions regarding an embryo, current jurisprudence in the lower courts is divided over whether that embryo should be considered a full person. While courts have never clearly agreed on a categorization or definition for embryos, they have typically defined them as either "life, property, or an amalgamation of the two."⁶⁵ In 2008, for example, Oregon became

62. Further, the parental right is addressed later still in *Stanley v. Illinois*, which reiterated the essential "rights to conceive and to raise one's children" and the protection of "the integrity of the family unit" under the Due Process Clause. 405 U.S. 645, 651, 658 (1972) (holding that denying Stanley a hearing before removing his child from his custody violated the Equal Protection Clause).

63. Lutz, *supra* note 57, at 224, 226–27 ("[W]hile constitutional parental rights are in general not easily abrogated, such rights may not be the basis for parental decisions that put the health, safety, and wellbeing of children at risk."). For example, in a per curiam affirmation, the Court found Jehovah's Witness parents did not have the authority to deny a blood transfusion during their child's surgery when the blood transfusion was potentially lifesaving. See *Jehovah's Witnesses v. King Cty. Hosp. Unit No. 1* (Harborview), 278 F. Supp. 488, 504 (D. Wash. 1967) (per curiam), aff'd per curiam, 390 U.S. 598 (1968). A statute allowing "superior court judges to temporarily declare children of Jehovah's Witnesses as wards of the State in order to allow them to receive blood transfusions over the express objections of their parents" was also later deemed constitutional. Lutz, *supra* note 57, at 226.

64. 442 U.S. 584, 603 (1979) (citing *Yoder*, 406 U.S. at 230; *Prince*, 321 U.S. at 166). Still, the Court ultimately acknowledged that most children were not able to make their own medical judgments and thus were subject to their parents' discretion, and absent a finding of bad faith, negligence, or abuse, parents retained "substantial, if not the dominant" control over medical decisions. *Id.* at 603–04.

65. Tracy J. Frazier, Comment, Of Property and Procreation: Oregon's Place in the National Debate over Frozen Embryo Disputes, 88 Or. L. Rev. 931, 932, 936 (2009) (acknowledging embryos "have historically escaped a hard and fast definition in our courts in the arenas of abortion and stem cell research"). Context matters here: Whereas the Supreme Court has considered an amalgamated view in abortion decisions, some fetal homicide statutes have considered the unborn child a person. *Id.* at 937; see also Kathryn D. Katz, The Legal Status of the Ex Utero Embryo: Implications for Adoption Law, 35 Cap. U. L. Rev. 303, 323–24 (2006) (giving examples of how different states have defined

the first state to define embryos as marital property.⁶⁶ A litany of cases have considered the allocation of frozen embryos in divorce custody disputes, often using contract law to resolve the matter and ignoring the question of personhood all together.⁶⁷ State laws seeking to protect the health and welfare of *children* will have to address this embryo hurdle—when embryos are not explicitly deemed people, police powers of the state may arguably be diluted.⁶⁸

3. *Procreative Autonomy.* — A series of historic cases have articulated a now entrenched right to procreate without state interference.⁶⁹ In *Skinner v. Oklahoma*, the Court found procreation to be “one of the basic civil rights of man.”⁷⁰ The Court later held that the use of contraceptives was protected under a “zone of privacy created by several fundamental constitutional guarantees,” which encompassed both the right to procreate and not to procreate.⁷¹ This right to privacy implies a right “to be free from unwarranted governmental intrusion into matters so fundamentally affecting a person as the decision whether to bear or beget a child.”⁷² These cases serve to establish a right to privately make decisions about how and when to create offspring.

4. *The Right to Abortion.* — While there is a broad fundamental right to procreative choice, one procreative right has been subject to a unique narrowing: the right to abortion.⁷³ *Roe v. Wade* established the right based on the notion that the “right of privacy . . . is broad enough to encompass a woman’s decision whether or not to terminate her pregnancy.”⁷⁴

“embryo,” including Louisiana’s definition of a frozen embryo as a juridical person and New Mexico’s treatment of the embryo as a person “where it mandates implantation”).

66. See *In re Marriage of Dahl & Angle*, 194 P.3d 834, 838–39 (Or. Ct. App. 2008); Frazier, *supra* note 65, at 932.

67. See, e.g., *A.Z. v. B.Z.*, 725 N.E.2d 1051, 1057 (Mass. 2000) (finding unenforceable a consent form providing that pre-embryos would be awarded to the wife upon separation); *Kass v. Kass*, 696 N.E.2d 174, 182 (N.Y. 1998) (finding agreements regarding disposition should be presumed valid and binding); *Davis v. Davis*, 842 S.W.2d 588, 589, 604–05 (Tenn. 1992) (awarding custody of pre-embryos to the husband); *Roman v. Roman*, 193 S.W.3d 40, 54–55 (Tex. App. 2006) (finding an embryo agreement about the discarding of embryos valid and binding).

68. For further discussion of the state’s police power with regard to the health of the embryo, see *infra* section III.C.2.

69. See Robertson, *Genetic Selection*, *supra* note 7, at 425 (arguing the right to procreate “has a firm legal basis, even though this has not always been explicitly articulated”).

70. 316 U.S. 535, 541 (1942) (deeming a forced sterilization statute for prisoners unconstitutional under equal protection theory); see also Grant, *supra* note 1, at 1009 (“Though decided under the guise of equal protection analysis, *Skinner v. Oklahoma* represents the Court’s first treatment of procreation as a fundamental right.”).

71. See *Griswold v. Connecticut*, 381 U.S. 479, 485 (1965).

72. *Eisenstadt v. Baird*, 405 U.S. 438, 453 (1972).

73. See Jefferson, *supra* note 12, at 788 (“[T]he *Roe* Court provided an exceptionally narrow view of privacy.”).

74. 410 U.S. 113, 153 (1973). The Court noted, however, that this right is not unlimited, observing a pregnant woman “cannot be isolated in her privacy.” *Id.* at 159. The

However, the Court established in *Casey*, and applied in *Carhart*, an “undue burden test,” whereby a state regulation violates a woman’s right only when it places an undue burden on her ability to choose.⁷⁵ These cases marked a shift to a more rigorous balancing of “the liberty of the woman and the interest of the State in promoting prenatal life,”⁷⁶ meaning some state regulations proscribing a woman’s right to choose may be permissible.

Abortion jurisprudence has left the breadth of the procreative right somewhat ambiguous.⁷⁷ It is not yet clear when the Court will again call upon the undue burden test as opposed to its typical appeal to strict scrutiny.⁷⁸ Still, these cases do not seem to implicate the right to parental autonomy, which could continue to bolster and mutually reinforce procreative-autonomy jurisprudence in the future. Most commentators seem to have interpreted the abortion jurisprudence to have only affected the right to reproductive autonomy; further, perhaps the procreative right outside of the abortion context could remain unscathed.⁷⁹ Having laid out the relevant underlying rights, this Note now addresses the potential problems that may arise in the context of recent genetic-modification technologies.

II. GENETIC MODIFICATION AND POTENTIAL LITIGATION

While existing reproductive technologies are relatively accessible,⁸⁰ recent advancements may catalyze a litany of restrictive state legislation

Court thus established a three-part schedule determining the rights of the mother and the state at each stage of pregnancy. *Id.* at 164–65. It seems strange that parents may be isolated in their privacy to raise children, but women are somehow not isolated in their privacy to terminate a pregnancy.

75. *Gonzales v. Carhart*, 550 U.S. 124, 146 (2007); *Planned Parenthood of Se. Pa. v. Casey*, 505 U.S. 833, 874 (1992) (plurality opinion); see also *Jefferson*, *supra* note 12, at 789 (“[T]he Court further constrained the application of the privacy doctrine by reducing the heightened scrutiny from strict scrutiny to an undue burden test.”).

76. *Casey*, 505 U.S. at 873.

77. Amber Stine, Note, *The Implications of the Due Process Clause on the Future of Human Embryonic Gene Therapy*, 45 Ariz. L. Rev. 507, 512 (2003) (“Most legal commentators agree that there is an affirmative right of procreation. However, they disagree as to the content and scope of this right.”). But see Carter J. Dillard, *Rethinking the Procreative Right*, 10 Yale Hum. Rts. & Dev. L.J. 1, 17 (2007) (“In all, from *Griswold* through *Casey*, the Court does no more than imply in dicta that a broad procreative right is somehow protected by vague notions of privacy.”).

78. See *Stine*, *supra* note 77, at 513 (“[T]he Supreme Court treated procreation as a fundamental right by invoking strict scrutiny”).

79. See Sonia M. Suter, *The “Repugnance” Lens of *Gonzales v. Carhart* and Other Theories of Reproductive Rights: Evaluating Advanced Reproductive Technologies*, 76 Geo. Wash. L. Rev. 1514, 1523 (2008) (noting even in instances when *Carhart* may limit reproductive rights, many have still interpreted the Court’s jurisprudence to “protect broad reproductive choice, which potentially encompasses . . . many forms of advanced reproductive technologies”).

80. See *supra* section I.A.2 (describing the current lack of regulation surrounding reproductive technologies in the United States). Still, though legally accessible, costs may

and responsive suits brought by parents seeking access to genetic-modification technologies. This Part addresses the new wave of reproductive technologies and the claims parents may bring if states seek to restrict access to them. Section II.A provides an overview of advances in genetic modification as well as the limited legislative and regulatory responses domestically and abroad. Section II.B then presents the problem of potential state restrictions on these technologies and why and what kinds of litigation could ensue.

A. *Genetic Modification of Singular Embryos and Its Relevant Regulation*

This section introduces the relevant recent advancements in reproductive technology related to genetic modification. These technologies have begun to garner the attention of regulators domestically and abroad. The advancements may ultimately become the subject of regulation and responsive litigation⁸¹ that will call into question the traditional boundaries of procreative and parental rights.

1. *Emerging Technologies in Genetic Modification and Ethical Implications.*

— Genetic modification allows *changes* to singular embryos, as opposed to *selection* among differently situated embryos, as in PGD. Generally, genetic modification is either somatic or germ line: When somatic changes alter only the individual embryo, germ-line modifications are passed on to future generations through that embryo's offspring.⁸² Somatic gene modification is typically therapeutic and can be used on existing persons to correct a disorder; it has been used since the 1990s on human embryos.⁸³ Germ-line modification had not been practiced on humans until recently.⁸⁴

prove prohibitive for parents. See Jimenez, *supra* note 23, at 383 ("Each attempt at conceiving through IVF costs between \$4,000 and \$18,000, depending on a doctor's fees and the price of administered drugs.").

81. See *infra* section II.B (discussing why states are likely to implement restrictive regulations and why parents will respond with litigation).

82. Markwood, *supra* note 36, at 475; see also Kelly, *supra* note 16, at 313–17 (describing in greater scientific detail the distinction between these two technologies).

83. Amanda H. Russo, Note, *Association for Molecular Pathology v. Myriad Genetics, Inc.* and Its Impact on the Patentability of "Designer" Genes, 4 N.Y.U. J. Intell. Prop. & Ent. L. 37, 47 (2014).

84. Two recent advancements in genetic modification have caused a stir in the scientific community. First, mitochondrial donation, or three-parent IVF, is a form of germ-line modification that allows genetic material from one egg's nucleus to be transferred into that of a second egg and thereby eradicate disease from mitochondrial-cell mutations. J. Ravindra Fernando, Note, Three's Company: A Constitutional Analysis of Prohibiting Access to Three-Parent In Vitro Fertilization, 29 Notre Dame J.L. Ethics & Pub. Pol'y 523, 523–24 (2013). A second, more revolutionary form of modification has recently emerged, known as CRISPR, an acronym for "clustered regularly interspaced short palindromic repeat." See Heidi Ledford, CRISPR, the Disruptor, 522 Nature 20, 21 (June 4, 2015), http://www.nature.com/polopoly_fs/1.17673!/menu/main/topColumns/topLeftColumn/pdf/522020A.pdf [http://perma.cc/L664-WMB8] (defining the technology and explaining

Genetic modification is scientifically and ethically distinct from existing, commonly used reproductive technologies. As described in Part I, PGD allows parents to create several embryos, test them for specific traits such as disease or gender, and select the embryo that best reflects their desired outcome for their family.⁸⁵ PGD does not involve the genetic modification of any one embryo—it rather allows for the selection of a certain embryo. In this sense, parents using PGD do not change the future child being born but rather choose one embryo as part of the narrative of their family.⁸⁶ However, PGD may involve the waste and discard of many viable embryos, which could be ethically problematic for some.⁸⁷ Genetic modification of a singular embryo avoids this waste. Still, it involves a more active parental decision to manipulate specific traits in one embryo, so it may be prone to the criticism that parents are “design-

how it uses “guide RNA . . . then edits the DNA to disrupt genes or insert desired sequences”). Some scientists have expressed concerns regarding the safety of the procedure. See *id.* (acknowledging the concerns regarding “safety” and “remote risks”). These concerns recently escalated in response to an April 2015 study in China using CRISPR for the first time to edit human embryos. Puping Liang et al., CRISPR/Cas9-Mediated Gene Editing in Human Triploid Zygotes, 6 Protein & Cell 363 (2015). While the testing was conducted on embryos that were not meant to be implanted, the results—including unwanted DNA mutations—confirmed the trepidations of some in the scientific community. See Gina Kolata, Chinese Scientists Edit Genes of Human Embryos, Raising Concerns, N.Y. Times (Apr. 23, 2015), <http://www.nytimes.com/2015/04/24/health/chinese-scientists-edit-genes-of-human-embryos-raising-concerns.html> (on file with the *Columbia Law Review*) (“In almost every case, either the embryo died or the gene was not altered And speckled over their DNA was a sort of collateral damage—DNA mutations caused by the editing attempt.”). Still, these technologies mark movement in only one direction: forward, toward the possibility of being able to fully edit the genes of a particular embryo.

85. See *supra* section I.A.1.

86. Much ink has been spilled over whether making changes to a singular embryo, as opposed to selecting among embryos, is really changing the person being brought into the world, potentially harming that child. Professor Derek Parfit’s theory of the “Non-Identity Problem” posits selecting a certain child does not make it better or worse off, because it is the only child that could have been born upon selecting to implant that child. See Matthew Reisman, Note, Harm and the Fluid Nature of Identity in Wrongful Life Cases Involving Preimplantation Genetic Diagnosis, 20 Cardozo J.L. & Gender 405, 414–16 (2014). For example, Parfit argues in a hypothetical situation, in which a fourteen-year-old girl decides to have a child, that she does not make that child worse off by not waiting to have him in a few years: “Had the girl waited several years to have a child, she would have conceived a different individual entirely.” *Id.* at 415. Thus, this theory “assumes that harm requires a specific individual to transition from a better condition to a worse condition”; as such, some argue that specific modifications to embryos may constitute harm, whereas “indirect genetic interventions such as PGD” cannot cause this same harm, because it does not modify a “specific individual.” *Id.* at 415–16. However, other theorists have argued that the “Non-Identity Problem” also forecloses the possibility that individual embryos are harmed by genetic modification. See, e.g., Harry Adams, A Human Germline Modification Scale, 32 J.L. Med. & Ethics 164, 168 (2004) (“[A]rguably, that same person would not have existed without the [modification], but would have been a *different* person”).

87. See Baruch, *supra* note 25, at 249 (“Concerns about the safety of PGD focuses on how often embryo biopsies may damage or destroy embryos.”).

ing” their babies.⁸⁸ In this sense, it could be said these new technologies deserve even greater protection, as they implicate both procreative choices and parenting choices that affect the birth and *nature* of a particular child. For the same reason that these new technologies afford greater prenatal control to parents, states may feel greater urgency to step in and regulate.⁸⁹ This Note thus specifically focuses on genetic modifications to singular embryos because this wave in reproductive technology poses unique challenges that may encourage more urgent state action to curtail the right.⁹⁰

A final distinction concerns differences between therapeutic and nontherapeutic modifications.⁹¹ Therapeutic modifications are those that correct medical illnesses or genetic diseases, whereas nontherapeutic modifications involve nonmedical enhancements.⁹² Drawing the line of permissibility at some point between therapeutic and nontherapeutic modifications will prove challenging. The distinction is hardly binary and will be explored further in Part III. This section now examines the legal community’s treatment of genetic modifications.

2. *Genetic Modification and the Law.* — As with other reproductive technologies discussed in Part I, those allowing direct genetic modification of embryos have been subject to minimal treatment by legislative and regulatory bodies in the United States. This lack of regulation and oversight is problematic, for it could leave access to these technologies vulnerable to future state regulations that could either ban or curtail their use.⁹³

Though there are currently no explicit restrictions governing genetic modification at the state or federal level,⁹⁴ a federal ban on public fun-

88. Susannah Baruch describes the fear of designer babies that accompanies even the use of PGD: “The specter of ‘designer babies’ and parents selecting children based on characteristics such as appearance or intelligence has long haunted scientists, bioethicists, and policymakers alike.” *Id.* at 246.

89. For more on states’ motives to restrict access, see *infra* section III.B.1.

90. See, e.g., Adams, *supra* note 86, at 165 (addressing the potential “irreversible effects in and through all later generations” that may result from certain forms of genetic modification).

91. John A. Robertson, *Procreative Liberty in the Era of Genomics*, 29 Am. J.L. & Med. 439, 476–79 (2003) [*hereinafter* Robertson, *Procreative Liberty*].

92. See Adams, *supra* note 86, at 166 (noting the distinction “will not map so neatly or coextensively onto the distinction between morally obligatory and non-obligatory services”); Daniel L. Tobey, *What’s Really Wrong with Genetic Enhancement: A Second Look at Our Posthuman Future*, 6 Yale J.L. & Tech. 54, 153 (2004) (“[T]herapy is used to signify the correction of a problem (such as cancer treatment), while enhancement is something elective (such as cosmetic surgery).”).

93. See *supra* notes 31–35 and accompanying text (explaining the breadth of the police power, especially as it pertains to health and safety).

94. Baffi, *supra* note 5, at 367 (finding “no specific federal or state regulations governing attempts to genetically modify gametes”); see also Fernando, *supra* note 84, at 526–27 (“No federal or state legislation specifically governs [genetic modification], and federal oversight through the National Institute of Health . . . and the [FDA] . . . is limited.”).

ding for research in this field, and other related potential bans, sends the implicit signal that the federal government does not endorse the advancement of genetic modification at this time.⁹⁵ The funding ban could also create a disincentive for private organizations to conduct embryo-based research, as such organizations may rely on public grants to conduct research. Still, there is no outright federal ban on research on human embryos generally, meaning privately funded organizations could still conduct research in this field.⁹⁶

A recent and unprecedented change in U.K. legislation, however, has catalyzed a meaningful discussion that has been lacking in the United States.⁹⁷ The United Kingdom's regulatory agency for reproductive technologies, HFEA, convened in 2011 to review the efficacy and safety of mitochondrial donation—a form of modification allowing genetic material from one egg's nucleus to be transferred into another to prevent mitochondrial-cell mutations—and in February 2015, the House of Commons and House of Lords passed legislation approving clinical trials.⁹⁸ The Human Fertilisation and Embryology Regulation's explanatory note states, "These Regulations make provision to enable mitochondrial donation" to modify particular embryos under the oversight of the HFEA.⁹⁹

In the midst of the United Kingdom's consideration of the proposal, the FDA met in February 2014 to discuss "potential future clinical trials of mitochondrial manipulation technologies to prevent transmission of mitochondrial disease from affected women to their children and for the treatment of female infertility."¹⁰⁰ Perhaps in reaction to the initiative of a close peer nation, the FDA commissioned a committee at the Institute of

95. See Sara Reardon, NIH Reiterates Ban on Editing Human Embryo DNA, *Nature* (Apr. 29, 2015), <http://www.nature.com/news/nih-reiterates-ban-on-editing-human-embryo-dna-1.17452> [http://perma.cc/6HPQ-NJDB] ("[T]he Dickey-Wicker amendment specifically bans the government from funding work that destroys human embryos or creates them for the purpose of research. . . . [T]he law's wording would probably prohibit funding for work in a non-viable human embryo."); see also *infra* note 103 and accompanying text (discussing the possibility of a federal ban on mitochondrial-replacement therapy).

96. Reardon, *supra* note 95.

97. See Dina Fine Maron, When Will "3-Parent Babies" Come to the US?, *Sci. Am.* (Feb. 6, 2015), <http://www.scientificamerican.com/article/when-will-3-parent-babies-come-to-the-u-s/> (on file with the *Columbia Law Review*) (addressing whether U.K. action to legalize three-parent IVF for mitochondrial transfer will spur faster consideration in the United States); Matt Smith, FDA Considering 3-Parent Embryos, *CNN* (Feb. 27 2014), <http://www.cnn.com/2014/02/26/health/ivf-mitochondria/> [http://perma.cc/6R9D-QXFM] (noting the United Kingdom acted as a pioneer in being the first country to consider this procedure).

98. I. Glenn Cohen et al., Transatlantic Lessons in Regulation of Mitochondrial Replacement Therapy, 348 *Science* 178, 178–79 (2015), <http://science.sciencemag.org/content/sci/348/6231/178.full.pdf>.

99. Human Fertilisation and Embryology Regulations, *supra* note 3.

100. Oocyte Modification Briefing Document, *supra* note 4, at 4.

Medicine (IOM) to consider the safety of this procedure, and in 2016, the committee deemed the treatment “ethically permissible” under certain conditions.¹⁰¹ This step forward was short lived. A report from the Agricultural, Rural Development, Food and Drug Administration, and Related Agencies Appropriates Bill, 2016, reified Congress’s opposition to funding for genetic modification: “[T]he Committee includes bill language that places a prohibition on the FDA’s use of funds involving the genetic modification of a human embryo.”¹⁰² Further, in May 2016, a Senate committee began consideration of a bill that would extend a federal ban on mitochondrial-replacement therapy, affirming the rider amendment to the FY 2016 budget that banned the use of federal funds for research involving the genetic modification of embryos.¹⁰³

When the topic of genetic modification has found its way into the consciousness of the legal community, it seems that access has not been protected in any meaningful way.¹⁰⁴ Congress has not proven to be the path of least resistance to legitimizing the right to access genetic-modification technologies. Unlike HFEA, which oversees these reproductive technologies, the FDA and NIH do not have ultimate authority over the issue of reproductive technology; even when they do, bans on federal funding have limited their power to direct research or safety standards in this arena.¹⁰⁵ Creating a new agency entirely, like HFEA, “would add layers of administrative oversight to an already burdened research enterprise.”¹⁰⁶

101. Cohen et. al, *supra* note 98, at 179; Susan Scutti, 3-Parent Babies: FDA Advisory Panel Says Mitochondrial Therapy Research Is Ethical If Limited to Boy Embryos, *Med. Daily* (Feb. 5, 2016, 11:39 AM), <http://www.medicaldaily.com/fda-3-parent-babies-mitochondrial-therapy-boy-embryos-372366> [http://perma.cc/SWZ3-AUYY].

102. H.R. Rep. No. 114-205, at 69 (2015). Now passed under the Consolidated Appropriations Act, 2016, the bill included section 749, stating:

None of the funds made available by this Act may be used to notify a sponsor or otherwise acknowledge receipt of a submission for an exemption for investigational use of a drug or biological product under section 505(i) of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 355(i)) or section 351(a)(3) of the Public Health Service Act (42 U.S.C. 262(a)(3)) in research in which a human embryo is intentionally created or modified to include a heritable genetic modification.

Consolidated Appropriations Act, 2016, Pub. L. No. 114-113, § 749, 129 Stat. 2242, 2283 (2015) (to be codified in scattered sections of the U.S.C.).

103. Tanya Lewis, Bill Banning Mitochondrial Replacement Therapy Considered, *Scientist* (May 19, 2016), <http://www.the-scientist.com/?articles.view/articleNo/46119/title/Bill-Banning-Mitochondrial-Replacement-Therapy-Considered/> [http://perma.cc/BNV8-TR9J].

104. See Fernando, *supra* note 84, at 527 (arguing for a legal response to the “lack of meaningful regulation and escalating pressure”).

105. See *id.* at 526–27 (noting the limited oversight provided by the NIH and FDA).

106. Margaret Foster Riley with Richard A. Merrill, Regulating Reproductive Genetics: A Review of American Bioethics Commissions and Comparison to the British Human Fertilisation and Embryology Authority, 6 Colum. Sci. & Tech. L. Rev., 2005, at 1, 64. Comparing the United States’ and United Kingdom’s response to the permissibility of

Though genetic modification has caught the attention of the legal community, neither federal legislation nor federal regulatory oversight seems to sufficiently protect use of these emerging technologies and, if anything, blocks access. For now, private entities may continue to conduct research or to import certain technologies developed in other nations. This means private supply could meet demand in the United States, unless states intervene to limit access. Parents seeking access will want to protect their rights and will likely litigate. As a result, courts will likely have to respond to the question of whether parents are entitled to such access if and when litigation arises.¹⁰⁷ Section II.B discusses how the rise of genetic-modification technology, coupled with federal disapproval and the increased attention placed on modification in the legal community, may prompt restrictive state action and, in response, litigation by parties seeking access to genetic modification.

B. Potential State Restrictions and Responsive Litigation

In a relatively unregulated landscape, states may step in to restrict access to genetic modification, and parents may challenge the constitutionality of such restrictive statutes.¹⁰⁸ Parents cannot simply demand positive access to these technologies or public funding of such technologies. Instead, litigants may bring claims in response to state action.¹⁰⁹ This section first considers the types of regulations states may implement and the claims with which litigants would respond. The section then lays out the test the Court would use in evaluating such claims. Without the use of the fundamental rights doctrine to protect genetic modification, states would have the opportunity to chip away at the access to which parents should be constitutionally entitled.

1. *Potential State Restrictions.* — States seeking to enforce potential restrictions would draw upon their police powers to regulate issues that fall primarily within their purview, including social and health affairs;

mitochondrial donation, Professor Margaret Riley ultimately concludes, “Britain has developed a successful model for such regulation, but the two countries’ political, legal, and medical cultures differ enough that importation of the British model would be difficult and perhaps unwise.” Id.

107. See *id.* at 63 (“American enforcement relies on legal sanctions with frequent resort to the courts . . . ”).

108. See Jack M. Balkin, *How New Genetic Technologies Will Transform Roe v. Wade*, 56 Emory L.J. 843, 856 (2007) (“[F]uture litigants will demand that courts insulate new reproductive technologies from regulation on the grounds that individuals should be free to have children by any means that science permits. Currently, there is no clear boundary that makes a generalized right to reproductive autonomy inapplicable to new reproductive technologies . . . ”).

109. See, e.g., *supra* section I.B (providing an overview of the cases dealing with fundamental rights doctrine as applied to parental and procreative rights, all of which involve claims responsive to restrictive state statutes).

such affairs include an interest in preserving potential human life.¹¹⁰ States have generally and increasingly been free to exercise such police powers without being subject to federal intrusion on their authority, especially given that the scope of state legislative power, unlike that of the federal government, is not limited to those powers enumerated in the U.S. Constitution.¹¹¹ The limited federal action described above may be in part due to the fact that some see the issue of genetic modification as primarily a question of public health meant to be addressed by the states.¹¹²

Where a potential health threat has sprung from new advancement, states have often exercised their authority to step in and delineate the boundaries. In particular, regulating medical procedures “has long been considered within the purview of the states.”¹¹³ In the case of genetic modification, the validity of the state’s interest will depend on the level of scrutiny the Court applies,¹¹⁴ but the state will have to ultimately point to some reason rooted in public health—pertaining either to the public at large, the mothers, or the embryos—to justify such regulation. Regulations could come in two forms: (1) absolute bans on the use of genetic modification or (2) laws that hinder meaningful access to genetic modification by creating barriers or limits to access.¹¹⁵ One can envision myriad

110. See Stankovic, *supra* note 21, at 12–29 (identifying the source of the state’s authority and noting the reasons states would want to curtail reproductive technologies, such as protecting embryos as a vulnerable group and protecting women’s health, along with other public policy considerations); see also Donley, *supra* note 27, at 310 (“States have exercised their police powers to protect the health . . . of their citizens. Because these are “primarily[] and historically[] . . . matter[s] of local concern,” the “States traditionally have had great latitude under their police powers to legislate as to the protection of the lives, limbs, [and] health . . . of all persons.”” (third alteration in original) (quoting Medtronic, Inc. v. Lohr, 518 U.S. 470, 475 (1996))).

111. See Donley, *supra* note 27, at 310–11 (addressing concern about “federal encroachment into state police powers” and noting “[b]y narrowing the kinds of activities that the government can regulate to matters that are economic in nature and have a significant effect on interstate commerce, the Court has reserved certain areas of the law to the states”).

112. *Id.* at 311 (noting where police powers are involved, the Court has not allowed federal regulators to simply substitute their own opinions for that of the state, discouraging federal action when the state is best positioned to regulate).

113. *Id.* at 318; see, e.g., *supra* section I.B.2 (noting the state’s authority to preempt parental medical decisions for their children); *supra* section I.B.4 (finding abortion jurisprudence narrowed the procreative right to abortion in the name of public and private health); see also *Roe v. Wade*, 410 U.S. 113, 150 (1973) (acknowledging the importance of the state balancing a woman’s choice against the risk to the mother’s or the child’s health).

114. For an explanation of the levels of scrutiny the Court applies, see *infra* section II.B.2; see also Stine, *supra* note 77, at 532 (“As regulations are challenged, the courts will determine which standard of review to use in evaluating the constitutionality of such state action.”).

115. State laws banning research and development of genetic modification, on the other hand, would not be subject to the same problem. While advancing genetic-modification technology within the United States may be desirable, this is different from providing

iterations of restrictive laws here. Beyond full bans on genetically modifying singular embryos altogether, less prohibitive laws could include: bans on modifications based on the desire to correct for certain illnesses or traits, restrictive waiting periods before parents may go through with modifications, and caps on the number of modifications that may be made per embryo or per family.

As expansive as the procreative and parental rights may be, states have succeeded in pushing back against these rights in certain instances already. Current state practices are indicative of the desires of some states to limit access to reproductive technologies and foreshadow potential limitations in the future. Most notably, the Court's abortion jurisprudence has recognized a state's interest in protecting the health of the mother, child, and society as a whole.¹¹⁶ Recently, state limitations on abortion have come up in the context of "reasons-based abortion bans."¹¹⁷ In 2013, North Dakota became the first state to ban abortions based solely on the disability or sex of the fetus, and Indiana and Missouri have introduced similar bills.¹¹⁸ Arizona, Illinois, Oklahoma, and Pennsylvania have banned abortion when the abortion is sought on the basis of sex selection, and nine other states have followed in introducing similar bans.¹¹⁹

The specter of state police powers, coupled with these examples of states' abortion bans, points to a high likelihood that states will seek to curb genetic modification. There is already a major concern that the "recent trend toward enacting abortion bans, coupled with the explicit encouragement of various anti-choice groups to continue down this path, signals the willingness of legislatures to push forward with such reasons-based abortion legislation."¹²⁰ Perhaps even more than other reproductive technologies, genetic modification incites a sort of existential anxiety about the rise of parental god complexes and an indelible shift to a nation

access. The technology may be developed anywhere and imported to the United States. In other words, as long as the research happens somewhere and access happens here, concerns regarding limitations on research, public or private, are outside the scope of this Note. See Knouse, *supra* note 29, at 146 (noting the "Supreme Court has consistently declined to require subsidies for the exercise of even fundamental rights" but acknowledging that the legislature could choose to provide such subsidies).

116. See Dov Fox, *The State's Interest in Potential Life*, 43 J.L. Med. & Ethics 345, 347–48 (2015) [hereinafter Fox, *State's Interest*] (identifying the state's interest in prenatal life as a "concern for 'protecting prenatal life' from conduct that would extinguish it" (quoting *Roe*, 410 U.S. at 150)); Plummer, *supra* note 22, at 540 ("The Constitutional protection afforded to women's right to abortion without state interference is not without limits. The State has an obligation to regulate to safeguard health, maintain medical standards, and protect potential life.").

117. Donley, *supra* note 27, at 303.

118. Id. For the details of the North Dakota bill, see N.D. Cent. Code § 14-02.1-04.1 (2016).

119. Donley, *supra* note 27, at 303. Arizona also bans race-selective abortion, though it is unclear what this would mean in practice. Id.

120. Id. at 304.

of projects, not children.¹²¹ The panic surrounding the science-fiction-like nature of genetic modification¹²² may come to a head in the form of state legislation, particularly as some peer world leaders have begun to address genetic modification.¹²³

2. *Litigation Response and Level of Scrutiny.* — When states exercise their authority to regulate medical procedures, litigants may seek to bring claims against the state for restricting access to genetic modification as an extension of their procreative and parental rights, as they have often done.¹²⁴ Litigants would claim a violation of their Fourteenth Amendment due process rights to procreative liberty and parental autonomy.¹²⁵ These suits would seek to remove bans or reverse restrictions on access to genetic modification on the basis of the state's violation of the litigant's constitutional right. If, and likely when, litigants bring forth such constitutional challenges, "the Court must be prepared to articulate the boundaries of the procreative [and parental] liberty right at issue."¹²⁶

The problem of state restriction and reactive litigation begets the challenge of defining the level of scrutiny for the Court to apply in these cases. There are three traditional established levels of scrutiny—strict,

121. See, e.g., Markwood, *supra* note 36, at 486–91 (urging the reader to consider the ethical concerns arising from allowing genetic manipulation).

122. See *supra* note 88 (finding the concept of designer babies has haunted legislatures and bioethicists alike); see also Olga Khazan, We're Already Designing Babies, *Atlantic* (July 3, 2014), <http://www.theatlantic.com/health/archive/2014/07/were-already-designing-babies/373896/> [<http://perma.cc/LP56-VHQQ>] ("Penetrating the inside of a cell and tampering with its contents is, at best, controversial, and at worst, 'walking in Hitler's footsteps . . .'") (quoting a letter written to the FDA)).

123. See *supra* notes 2–3 and accompanying text (finding advancements on this front in both the United Kingdom and China).

124. Throughout history, laws restricting reproductive and parental rights have been met with litigation. See *supra* section I.B. Though genetic-modification cases have not yet arisen, there is no compelling reason restrictions on access to genetic modification would not similarly face such claims. As technology advances, new medical procedures have either advanced or bumped up against citizens' due process rights, and litigants have accordingly sought the right to use or not use these technologies. See generally *Washington v. Glucksberg*, 521 U.S. 702 (1997) (seeking access to euthanasia and establishment of the right to die by using procreative rights cases); *Roe v. Wade*, 410 U.S. 113 (1973) (seeking to establish the right to abortion technology to terminate pregnancy using the procreative rights cases); *Jehovah's Witnesses v. King Cty. Hosp. Unit No. 1* (Harborview), 278 F. Supp. 488 (D. Wash. 1967) (per curiam), aff'd per curiam, 390 U.S. 598 (1968) (seeking to prevent the use of blood transfusion technology for a child by using the line of parental and religious liberty rights cases).

125. See, e.g., *Glahn, supra* note 51, at 427 ("Two separate lines of cases, one protecting reproductive liberty and the other protecting parental rights . . . serve as a possible basis for the defense of genetic modification as a fundamental right."); *Stankovic, supra* note 21, at 20 ("Critics could argue that such a bill would invade privacy. 'Privacy' has come to represent a bundle of individual rights and liberties that are derived from the Due Process Clause."); *Grant, supra* note 1, at 1008 ("[T]he Court will likely be called upon to perform a Fourteenth Amendment due process analysis . . .");

126. *Grant, supra* note 1, at 1000.

intermediate, and rational basis—and an undue burden test, which has been applied in the context of abortion cases.¹²⁷ Where the Court identifies a fundamental right, the most stringent standard, strict scrutiny, is triggered, meaning the state statute must serve a compelling government interest, must be narrowly tailored to that interest, and must be the least restrictive means for achieving the interest.¹²⁸ Courts will have to determine what sort of interest or right is at stake in order to determine the level of scrutiny with which to analyze the state statutes. The concern with establishing the right to genetic modification as anything but expressly fundamental is that it would leave the right vulnerable to restrictive state laws that would arbitrarily carve out genetic modification as beyond the scope of parental and reproductive choice.¹²⁹

3. Glucksberg Framework. — To assert a fundamental right, litigants will have to meet the two-pronged standard set out in *Washington v. Glucksberg*.¹³⁰ First, the right must be objectively “deeply rooted in this Nation’s history and tradition”; second, the test requires a “careful description” of the asserted fundamental liberty interest.¹³¹ As to the first requirement, the Court will not deduce a right from “abstract concepts of personal autonomy” and has emphasized rooting the right in history and common law practice.¹³² As to the second, the Court has warned against the assumption that the line of substantive due process cases justifies a “sweeping conclusion that any and all important, intimate, and personal decisions are so protected.”¹³³ Depending on the outcome of this inquiry, the right will then be balanced against government interests with varying levels of rigor. Having established in Part II states’ power to restrict access and litigants’ predicted response to the exercise of such power, Part III considers each *Glucksberg* factor in turn and concludes that access to genetic modification deserves protection as a fundamental right.

127. Fernando, *supra* note 84, at 533, 537.

128. *Id.* at 533.

129. See *infra* Part III for a full analysis of why the right to genetic modification is fundamental and must therefore be protected under strict scrutiny.

130. 521 U.S. 702 (1997); see Fernando, *supra* note 84, at 540–41 (identifying the test in *Glucksberg* as the traditional test “for identifying those fundamental rights worthy of substantive due process protection” and acknowledging the test has not always been consistently applied).

131. *Glucksberg*, 521 U.S. at 720–21 (quoting *Moore v. City of East Cleveland*, 431 U.S. 494, 503 (1976) (plurality opinion)).

132. *Id.* at 725. For example, the Court refers to *Cruzan v. Director, Missouri Department of Health*, 497 U.S. 261 (1990), in which it recognized a right to the removal of life-sustaining medical treatment, as being deeply rooted in the common law rule that “forced medication was a battery, and the long legal tradition protecting the decisions to refuse unwanted medical treatment.” *Id.*

133. *Id.* at 727.

III. JUSTIFYING THE RIGHT TO GENETIC MODIFICATION

To protect against restrictive state regulation, prospective litigants should be able to argue for a fundamental right to access genetic modification under the existing line of substantive due process cases.¹³⁴ Part III first contends that the Court is the best-suited institution to protect access to genetic modification. Next, this Part addresses how litigants should go about establishing a fundamental right per the *Glucksberg* test.¹³⁵ After finding such a right, this Part argues why, under the strict scrutiny test, state interests are insufficiently compelling to justify restrictions or bans to access in most cases. Thus, litigants concerned about using this burgeoning technology should be able to secure the right to do so based on the Court's past treatment of other procreative and parental rights.

A. *Why the Court?*

The Court would be the institution best suited to protect access to genetic modification. Legislation and regulation on the federal level appear scarce and prohibitive, especially when there is no clear federal regulatory body to oversee reproductive technologies and when reproductive technologies seem to fall more so within the purview of states and their police powers.¹³⁶ If left to the states, as regulation of medical procedures often has been, access to genetic modification may be rendered vulnerable to piecemeal state regulations. Such regulations could chip away at access unless it is formally announced as a fundamental right.¹³⁷ The Court has the ability to secure this right meaningfully in the face of restrictive regulation.

In particular, the judicial system has served as an effective check against states' impermissible regulation of fundamental rights where said

134. See supra section I.B for due process cases involving procreation and parental rights.

135. See supra section II.B.3 (laying out the *Glucksberg* analysis).

136. See supra section II.A.2 (discussing the lack of federal legislative response and the unfinished discussions held by the FDA); supra section II.B.1 (delineating the scope of state police power and its uses in the medical realm); see also Meredith Leigh Birdsall, An Exploration of “The ‘Wild West’ of Reproductive Technology”: Ethical and Feminist Perspectives on Sex-Selection Practices in the United States, 17 Wm. & Mary J. Women & L. 223, 225 (2010) (noting politicians may be reluctant to enter into debates regarding issues such as sex-selective abortions because these debates are not “politically advantageous” or may be found too divisive).

137. Access to abortion could be considered a quintessential example of the type of erosive power states do wield. Though the Court found a liberty interest in terminating pregnancies, states have still implemented, and the Court has upheld, barriers to access for women, including waiting periods and parental-consent provisions. See, e.g., *Planned Parenthood of Se. Pa. v. Casey*, 505 U.S. 833, 885–87, 899–900 (1992) (plurality opinion); see also supra notes 116–119 and accompanying text (discussing sex-selective-abortion statutes and the limits they impose on the reasons a woman can consider to justify terminating her pregnancy).

regulations were based on moral views masked as legitimate state interests.¹³⁸ The Court's strict scrutiny test—which, as will be discussed in section III.C, should be applied here—provides substantial protection for any right deemed fundamental. It places a heavy, nearly insurmountable burden on the government to show a compelling interest and requires the state regulations to be narrowly tailored to that interest and the least restrictive means of securing that interest.¹³⁹ Of course, substantive due process does not automatically protect all new technological advancements that conceivably relate to the exercise of personal autonomy.¹⁴⁰ Rather, as Part I shows, the Court has protected personal autonomy as fundamental *specifically* in the realm of procreative and parental rights,¹⁴¹ making the issue of access to genetic modification, as both a reproductive technology and a tool to implement parental choice, particularly well suited to protection by the Court. The strong protection that the fundamental right badge can afford best ensures the meaningful availability of genetic modification for prospective parents.

Though the Court has been reluctant to expand protection to new areas,¹⁴² access to genetic modification may be seen as part and parcel of existing fundamental rights.¹⁴³ Some have argued that the Court is wary of making decisions involving overly scientific or technical issues,¹⁴⁴ but the Court has not shied away from evaluating the validity of medical

138. See Alexander D. Wolfe, *Wrongful Selection: Assisted Reproductive Technologies, Intentional Diminishment, and the Procreative Right*, 25 T.M. Cooley L. Rev. 475, 497 (2008) (“The U.S. Constitution does not permit states to impose their moral beliefs on the personal lives of their citizens.”); see also, e.g., *Eisenstadt v. Baird*, 405 U.S. 438, 452 (1972) (declining to uphold a statute denying unmarried citizens access to contraceptives and concluding “despite the statute’s superficial earmarks as a health measure, health, on the face of the statute, may no more reasonably be regarded as its purpose than the deterrence of premarital sexual relations”).

139. See *supra* note 128 and accompanying text (describing the stringent strict scrutiny standard); see also Robertson, *Procreative Liberty*, *supra* note 91, at 446 (“Although not the only relevant perspective to take on these issues, a rights-based perspective focuses attention on key aspects of the individual and societal concerns at issues with these techniques.”).

140. See *Washington v. Glucksberg*, 521 U.S. 702, 725 (1997) (noting fundamental rights cannot simply be extrapolated from “abstract concepts of personal autonomy”).

141. See *Coan*, *supra* note 11, at 247 (“Why constitutionalize a right to procreative, sexual, and child-rearing liberty when so many other vital liberties go unprotected, at least by courts? . . . The most plausible principled explanation is that courts have felt institutionally better positioned to protect this right . . . than other normatively plausible candidates for constitutional protection.”).

142. See *Glahn*, *supra* note 51, at 429.

143. For a careful description of the asserted right and its connection to rights already recognized by the Court, see *infra* section III.B.2.

144. See, e.g., *Coan*, *supra* note 11, at 251 (“[T]he Court (and lower courts as well) has been especially reluctant to recognize new constitutional rights where doing so would require it to make complex empirical assessments, especially about broad scientific or sociological questions.”).

regulations, even where it has required scientific inquiry.¹⁴⁵ The Court is both well suited and well equipped to protect access to genetic modification and should find a fundamental right under the *Glucksberg* analysis in order to remain consistent with its current substantive due process jurisprudence.

B. Fundamental Rights Analysis

To warrant fundamental rights protection and thus trigger the Court's protective strict scrutiny review, genetic modification must be deeply rooted in the nation's history and tradition and fit under a carefully described asserted right.¹⁴⁶ This section considers each requirement in turn, addressing arguments and counterarguments as to whether parents have a fundamental right to genetically modify their embryos.

1. *Is the Right Deeply Rooted?* — At first glance, genetic modification, a new technology, may not seem deeply rooted in the history and traditions of this nation. However, Justices have interpreted and applied this "deeply rooted" standard differently. In *Roe v. Wade*, Justice Blackmun considered whether there had been a consistent tradition of *opposing* access to abortion.¹⁴⁷ A more stringent approach would look to whether the right has been actively *protected* in history.¹⁴⁸ In part, this question turns on how expansively the Court views the right. At the narrowest level, a right to genetically modify one's embryos has been neither historically protected nor opposed, since the technology is such a recent development.

On the other hand, a broader conception of privacy to make procreative and parental choices may be deeply rooted in the history and traditions of this nation.¹⁴⁹ The case law described in Part I has long protected access to contraception and abortion, and though PGD is a recent deve-

145. Consider, most notably, the trimester framework the Court set up in *Roe v. Wade*; the Court comfortably exercised its discretion over a very technical matter and determined the appropriate level of state interference at each trimester of pregnancy based on available scientific information. See 410 U.S. 113, 164–65 (1973) (summarizing the trimester framework). Later, the Court again exercised this discretion in finding "viability" to be the scientifically relevant turning point for state interference. Planned Parenthood of Se. Pa. v. Casey, 505 U.S. 833, 860–61 (1992) (plurality opinion).

146. See *supra* section II.B.3 (describing the two-pronged *Glucksberg* test).

147. See 410 U.S. at 130–41 (detailing the lack of historical opposition to abortion, and its only recent criminalization, and using this as a justification for finding abortion deeply rooted in the nation's history and tradition).

148. See, e.g., *Washington v. Glucksberg*, 521 U.S. 702, 725 (1997) (finding that while there is a long tradition of protecting against unwanted medical treatment, the "decision to commit suicide with the assistance of another . . . has never enjoyed similar legal protection"); *Michael H. v. Gerald D.*, 491 U.S. 110, 124 (1989) ("[T]he legal issue in the present case reduces to whether the relationship between persons in the situation of Michael and Victoria has been treated as a protected family unit under the historic practices of our society, or whether on any other basis it has been accorded special protection.").

149. See, e.g., *Glucksberg*, 521 U.S. at 762 (Souter, J., concurring in the judgment) (discussing the fundamental nature of procreation).

lopment, there has been little to no regulation opposing access, even if courts or legislators have not actively protected it.¹⁵⁰ This is a fluid inquiry, and the Court should consider both the absence of restrictions on similar technologies and the active protection of bearing, begetting, and exercising parental control over an “average, healthy child.”¹⁵¹ To argue that new technologies themselves must narrowly and directly have a foothold in the nation’s history and tradition¹⁵² would be to make the sweeping conclusion that the Constitution necessarily bars all technological advancement from protection by virtue of being new. This could not be what the Court intended, as it has regularly protected new technological advancements on the basis of their centrality to the exercise of more broadly protected rights.¹⁵³

Finally, it is possible that the Court may circumvent the historical question all together, especially if the analysis is taken up while Justice Kennedy is still on the Court, as he has not found this line of inquiry dispositive.¹⁵⁴ Under such a looser standard, the unregulated status of recent reproductive technologies, coupled with the line of existing substantive due process cases, should most likely satisfy the first prong of this test.

2. *What Is the Carefully Asserted Right?* — The more difficult question then is articulating the precise right litigants would be asserting in pursuing access to genetic modification. Genetic modification is intimately

150. See *supra* sections I.A–B (describing the lack of regulation of reproductive technology and protection of reproductive and procreative rights in Supreme Court jurisprudence). But see Coan, *supra* note 11, at 255 (“While the practice of genetic selection has been largely unregulated since its inception, the technologies involved have been in clinical use for a few decades at most.”).

151. Cf. Stine, *supra* note 77, at 515 (arguing procreative liberty interest should extend to the use of gene therapy in pursuit of the same goal).

152. See Rosato, *supra* note 30, at 98 (“ART does not involve a right that has been traditionally protected. ART has existed for only twenty-five years.”).

153. See, e.g., *Cruzan v. Dir. Mo. Dep’t of Health*, 497 U.S. 261, 269–79 (1990) (protecting the right to terminate artificial hydration, a relatively new technology, based in part on a historical right to refuse medical treatment); see also Fernando, *supra* note 84, at 546 (noting some argue “[s]ince parental autonomy includes discretion to decide whether children will receive the benefits of genetic modification, access to HGGM [human germline genetic modification] is protected” by the Court’s case law on parental autonomy); Nancy Pham, Note, *Choice v. Chance: The Constitutional Case for Regulating Human Germline Genetic Modification*, 34 Hastings Const. L.Q. 133, 140 (2006) (arguing that regardless of a narrow or broad definition, genetic modification should fit under the fundamental rights framework as central to reproductive decisionmaking).

154. See *Lawrence v. Texas*, 539 U.S. 558, 572 (2003) (“[H]istory and tradition are the starting point but not in all cases the ending point of the substantive due process inquiry.” (alteration in original) (internal quotation marks omitted) (quoting *County of Sacramento v. Lewis*, 523 U.S. 833, 857 (1998) (Kennedy, J., concurring))). In *Lawrence*, Justice Kennedy looked to more recent treatment of adults’ liberty interest in privately operating and controlling their sexual lives. *Id.* at 571–72 (“[W]e think that our laws and traditions in the past half century are of most relevance here. These references show an emerging awareness that liberty gives substantial protection to adult persons in deciding how to conduct their private lives in matters pertaining to sex.”).

tied to the process of procreation, as modifications would be made during or before the procreative process. Moreover, the decision is strongly related to parental autonomy in making choices about how to raise one's child, differing from the line of parental rights cases only in that, here, the choices would be made prenatally.

As choosing a future child's genetics implicates one's role as both a parent and a procreator, a truly reflective and full description should assert a right to privacy¹⁵⁵ against state interference¹⁵⁶ to make decisions central to procreation and to parenting.¹⁵⁷ Allowing modification of genetic characteristics falls within such a right because it will enhance procreative liberty by putting power into the hands of parents to decide "whether the characteristic in question is one that is central or material to a reproductive decision."¹⁵⁸ The technology also allows parents to make choices about how to "establish a home and bring up children" as articulated in *Meyer v. Nebraska*¹⁵⁹—arguably, part of the fundamental good of having a child is getting to raise a healthy, happy child.¹⁶⁰ This expansive articulation of the right avoids having to assert an overly narrow or literal right just to genetic modification while still protecting the technology, as it can critically affect decisions to create and raise a child. Just as other procreative choices fit under the broad category of the procreative right, and parental choices under the parental one, the choice to genetically modify an embryo fits snugly in the intersection of both of these doctrines. Unlike euthanasia, for example, which demands articulating a new right—a right to die—genetic modification fits within existing

155. For more on the right to privacy, see Stine, *supra* note 77, at 517 ("The right to privacy has been derived from the Fourteenth Amendment's Due Process Clause The Supreme Court has addressed the right to privacy in the areas of reproductive choice, marital relationships, family relationships, child rearing, and education." (footnotes omitted)); see also Plummer, *supra* note 22, at 529 (noting the privacy right includes the right to marry, procreate, and use contraception).

156. See Robertson, *Procreative Liberty*, *supra* note 91, at 448 ("Like most moral and legal rights in liberal society, procreative liberty is primarily a negative claim-right—a right against interference by the state or others with reproductive decisions").

157. See Rosato, *supra* note 30, at 100 (noting similar decisions in the context of ARTs "are as much parental as they are procreative; perhaps, even more so, as technology gives parents greater control over their children's lives before they are born").

158. Robertson, *Genetic Selection*, *supra* note 7, at 429.

159. 262 U.S. 390, 399 (1923).

160. See Glahn, *supra* note 51, at 431 ("The Court, through such decisions as *Meyer* and *Pierce*, should be construed as having articulated a general right of parents to inculcate positive traits in their children"); Robertson, *Genetic Selection*, *supra* note 7, at 435 (arguing that genetic modification falls "squarely within procreative choice," as "procreative liberty involves the choice to have healthy children"). Professor John Robertson himself focuses only on those decisions central to reproduction. See Robertson, *Procreative Liberty*, *supra* note 91, at 454. However, Robertson fails to consider the centrality of such prenatal choices to parental autonomy and fails to make use of the overlap in these substantive due process cases that strengthen the case for protecting genetic modification.

jurisprudence. The rationales behind both doctrines support allowing genetic modification, obviating the need to demand a separate right to genetic modification, alone and unsupported by existing authority.

Such a broad definition may run the risk of being rejected for not being adequately “careful.”¹⁶¹ It is not inconceivable that the Court would require a more literal assertion. However, later in *Lawrence*, the Supreme Court avoided such particular language and defined the protection of the Fourteenth Amendment as broadly covering matters central to personal autonomy:

These matters, involving the most intimate and personal choices a person may make in a lifetime, choices central to personal dignity and autonomy, are central to the liberty protected by the Fourteenth Amendment. At the heart of liberty is the right to define one’s own concept of existence, of meaning, of the universe, and of the mystery of human life. Beliefs about these matters could not define the attributes of personhood were they formed under compulsion of the State.¹⁶²

Where genetic modification is found central to the personal choice to procreate and raise a child, then, the privacy to make choices “centrally or intimately connected with reproductive decision-making” and parenting, without state interference, should be protected.¹⁶³ The looser approach in *Lawrence* seems to support a right predicated on this broader assertion of privacy.

Critics have raised several arguments opposing an articulation of this right as a privacy one. Some have drawn a distinction between freedom from unwanted bodily invasion and general control over one’s body, arguing the latter is not protected, as it is a positive claim to access as opposed to a negative claim against unwanted intrusion.¹⁶⁴ However, in asserting a right to make private choices about the kind of child one

161. For example, the Court in *Glucksberg* emphasized the precision of its definitions, drawing a distinction between *Cruzan*, which asserted a right to refuse lifesaving hydration and nutrition, and *Glucksberg*, which asserted a right to assisted suicide—the Court refused to extrapolate from *Cruzan* a general “right to die.” *Washington v. Glucksberg*, 521 U.S. 702, 722–23 (1997) (quoting *Compassion in Dying v. Washington*, 79 F.3d 790, 799 (9th Cir. 1996)).

162. *Lawrence v. Texas*, 539 U.S. 558, 574 (2003) (internal quotation marks omitted) (quoting *Planned Parenthood of Se. Pa. v. Casey*, 505 U.S. 833, 851 (1992) (plurality opinion)); see also Pham, *supra* note 153, at 139–40 (“Some argue that *Lawrence* signals the death of the narrow approach to defining rights”).

163. Robertson, *Procreative Liberty*, *supra* note 91, at 454.

164. See, e.g., Radhika Rao, *Equal Liberty: Assisted Reproductive Technology and Reproductive Equality*, 76 Geo. Wash. L. Rev. 1457, 1465 (2008) (arguing the right to genetically modify a child does not implicate issues of bodily invasion and thus does not warrant protection under a right to privacy); Pham, *supra* note 153, at 141 (concluding the Court is unlikely to find genetic modification as a fundamental right because it does not involve a “woman’s bodily integrity”).

wants to create and raise, a *bodily* invasion requirement should not be necessary. Denying access would arguably be an invasion on the way a parent chooses to get pregnant—for example, a woman with an inheritable trait or illness may refuse to procreate unless she can ensure her child will not inherit it.¹⁶⁵ Some also contend that the fact that a child is involved creates “relational concerns” that extract the question from the realm of privacy.¹⁶⁶ However, procreative liberty has long been considered a private affair, though it is almost always relational, because it involves the making or not making of another life. To act privately does not mean to act in isolation but to act autonomously, without state interference.¹⁶⁷

A final concern with articulating a broad privacy right is how far this right may extend—namely, should this right protect genetic modifications meant not only to correct disorders but also to enhance the embryo? Though drawing this exact line is beyond the scope of this Note, a few considerations bode in favor of including enhancements under the umbrella of protected modifications. On a practical level, having courts make determinations as to what qualifies as the baseline for a “normal” child could quickly become an entropic, unprincipled exercise.¹⁶⁸ Further, genetic enhancement can be seen as a prenatal iteration¹⁶⁹ of the types of parental choices courts have long protected, such as how to raise and educate a child.¹⁷⁰ Similarly, the exercise of procreative autonomy may involve choosing to procreate or not based on whether certain traits

165. See Robertson, *Genetic Selection*, *supra* note 7, at 427 (“If a person would choose not to reproduce if she knew that the child would have a disability or some other undesired characteristic, then she should be entitled to have that information and to act on it.”); see also Grant, *supra* note 1, at 1013 (“Because these technologies exist to provide greater information to parents about the benefits and burdens of continuing a particular pregnancy, they necessarily implicate parents’ ability to make an informed decision about whether they can or want to have a particular child.”).

166. Dillard, *supra* note 77, at 49.

167. See *Eisenstadt v. Baird*, 405 U.S. 438, 453 (1972) (“If the right of privacy means anything, it is the right of the *individual*, married or single, to be free from unwarranted government intrusion . . .”).

168. Tobey, *supra* note 92, at 153 (noting the distinction “runs into trouble at the margins”). But see Knouse, *supra* note 29, at 142 (expressing concern over parents articulating “a therapeutic reason as a pretext to achieve a nontherapeutic goal”).

169. It should be noted that prenatal parenting choices aiming to shape the future child are already allowed in the context of sperm-donor selection, for example. Many clinics have identified “most-requested” donors based on the donor’s genetic characteristics. Knouse, *supra* note 29, at 145 (quoting Michelle Dennison, *Note, Revealing Your Sources: The Case for Non-Anonymous Gamete Donation*, 21 J.L. & Health 1, 15 (2008)).

170. See *supra* note 59 and accompanying text (noting a parent may direct the education of a child toward the important tasks of Amish life). In *Yoder*, the right that the parent sought was not the right to a child who is a good farmer. See *Wisconsin v. Yoder*, 406 U.S. 205, 232 (1972) (“[T]his case involves the fundamental interest of parents . . . to guide the religious future and education of their children.”). Similarly, the right to genetically modify an embryo to increase its intelligence is not a right to an intelligent child. Rather, it is the right to direct the upbringing of the child, and it would be an unprincipled distinction to sever the right just because the directing is happening in the embryonic stage.

could be selected, which is no less valid a determinant than other reasons people use to justify procreating or not.¹⁷¹

These rights, to procreate and parent, are not simply the right to do or not do those acts. They are the right to make choices about the circumstances surrounding those decisions in order to build one's life in a meaningful way.¹⁷² If this feels somehow too amorphous,¹⁷³ one only need look to all the ways parents are already able to make choices to enhance the particular child they bear.¹⁷⁴ The Court should not engage in the speculative exercise of deciding which traits are central to the reproductive and parental decision, though of course there are conceivable modifications that should most likely be impermissible in that they pose serious danger to an offspring.¹⁷⁵ Thus, the Court should afford genetic modification the ultimate protection of strict scrutiny, discussed below, and prevent states from restricting access without a compelling interest.

C. Application of Strict Scrutiny

Assuming that the fundamental rights test is met, the Court would thereafter apply strict scrutiny to relevant state regulations.¹⁷⁶ This section considers three primary interests the government may assert: the health of the mother, the health and well-being of the child, and the health and well-being of society as a whole. Because most state arguments would likely fail on the first requirement under strict scrutiny, asserting a compelling interest, this section does not engage in a rote strict scrutiny analysis for each interest. Still, this section concedes that there are some legitimate concerns that could arise from allowing unbridled access to genetic modification.

1. *Preserving the Health of the Mother.* — A state may first argue that genetic modification of embryos has unforeseen health consequences for

171. See, e.g., Robertson, *Procreative Liberty*, *supra* note 91, at 465 (“The strongest case for the parents is if they would not reproduce unless they could select that trait Parents clearly have the right to instill or develop a child’s musical ability after birth. . . . [T]hey might then plausibly argue that they should have that right before birth as well.”).

172. See *id.* at 459 (“Having healthy offspring . . . is so central to the values of the human reproductive enterprise that choices over whether to reproduce should fall within a person’s or couple’s freedom.”).

173. For more on this consideration, see *infra* section III.C.3 (addressing concerns regarding diversity and access to resources, as well as the effect on a child’s emotional well-being).

174. See, e.g., Khazan, *supra* note 122 (arguing that the facts that partners choose mates, make use of PGD and selective abortions, and select sperm donors based on certain traits are all evidence that “we’re already designing babies”).

175. See *infra* section III.C.3 (conceding that outlandish modifications risking the health or well-being of a child could be subject to government regulation).

176. See *supra* note 128 and accompanying text (laying out the strict scrutiny requirements and noting that the fundamental rights determination triggers strict scrutiny analysis).

women related to the implantation of these modified embryos.¹⁷⁷ This argument would not be unique to genetic modification but would apply to any reproductive technology that could affect a woman's health. Currently, all health risks associated with genetic modification are not yet known.¹⁷⁸ States may argue that as in *Roe v. Wade*, they must step in when a mother's health is seriously at risk during a pregnancy.¹⁷⁹ While such dangers could justify regulation in certain cases, the statute would need to be narrowly tailored to protect a woman's health, and an outright ban would likely be found impermissibly broad.¹⁸⁰ Ultimately, it is unlikely that medical practitioners would engage in unsafe modification procedures with great unknown risks, and lingering safety concerns would be mitigated over time, as with most medical procedures.¹⁸¹ Thus, this state interest would not pose a large threat to access to genetic modification.

2. *Preserving the Health and Well-Being of the Embryo.* — States may next claim an interest in protecting the physical and mental well-being of the recipient of the modification.¹⁸² Before addressing the extent of this protection, the question must be asked: Protection of whom?¹⁸³ If seen as mere property, the embryo would have no "health" to protect. If seen as a potential life, then the embryo would have an interest to be balanced against that of the parents, though that interest would not be as strong as that of a full person.¹⁸⁴ The importance of the state's interest will thus depend in part upon how courts interpret the legal status of the embryo. Even assuming the Court views an embryo as a potential life, many arguments the state could make would still be insufficiently compelling. Finally, while most of these claims should prove insufficiently compelling

177. See James A. Long, Note, Genetic Plastic Surgery: How Neoeugenics Creates a Culture of Stage Moms, 7 U. St. Thomas L.J. 203, 225 (2009) ("[T]he state may have a compelling interest in regulating the health of the embryos and their mothers.").

178. See Pham, *supra* note 153, at 146–48 (arguing germ-line modification in its current form has too many unknown dangers).

179. *Roe v. Wade*, 410 U.S. 113, 159 (1973) ("[I]t is reasonable and appropriate for a State to decide that at some point in time another interest, that of health of the mother or that of potential human life, becomes significantly involved.").

180. See *id.* at 163 (noting state regulation must be reasonably related to protecting maternal health).

181. See Pham, *supra* note 153, at 147 ("HGGM supporters could argue that these safety risks will improve with more research and be a non-issue in the future.").

182. See Fox, *State's Interest*, *supra* note 116, at 347 ("The state's interest in potential life is 'separate and distinct,' the Supreme Court held in *Roe v. Wade*, from the state's other interests—about 'medical standards' and women's 'health and safety'—that the Court also approved in that case as legitimate reasons to regulate reproductive conduct." (quoting *Roe*, 410 U.S. at 150, 154, 162)).

183. See *supra* note 65 and accompanying text (discussing the different definitions of an embryo and the lack of consistency in courts' treatment of embryos' rights).

184. See, e.g., *Gonzales v. Carhart*, 550 U.S. 124, 146 (2007) (affirming the state's interest in potential life).

to allow regulation, the state's strongest claim will likely involve attempts to ban or regulate intentional diminishment of embryos.

First, as with the mother's health, states may contend that the health risks of genetic modification are too hazardous for the embryo.¹⁸⁵ Some argue the risk of unpredictable harm to the embryo is simply too high.¹⁸⁶ Again, however, such modification would likely not be implemented until it was much safer.¹⁸⁷ Further, as with all medical advancement, there are never guarantees. Banning or restricting vaccination or antibiotics, for example, simply because one may not predict every consequence of their use over time, would hinder the very goals states' police powers are meant to advance. Finally, courts have permitted parents to exercise parental authority even in cases that included risk to a child's health.¹⁸⁸ Thus, unless further evidence shows truly detrimental health effects regarding the use of genetic modification, it is unlikely courts would find states to have a compelling interest based on this reason alone.

Second, courts have permitted states to encroach on the role of parents in cases where the best interest of the child, with regard to health or otherwise, is at stake.¹⁸⁹ Many argue the emotional harm to genetically modified children is great enough to warrant state intervention, particularly in the case of enhancement modification. Children, the argument goes, will feel undue pressure to live up to their modified trait: They will feel not like people but like commodities, and their sense of self-worth will be diminished as a result.¹⁹⁰ This argument is ultimately implausible.

185. See Pham, *supra* note 153, at 147 (discussing the potential safety risks to embryos from germ-line modification, including the failure of the new genome to integrate, incorrect gene expressions causing diseases later in life, and unknown consequences to the embryo's potential offspring).

186. See, e.g., *id.* ("In light of the current state of medical technology, HGGM is unsafe and could likely lead to illness and potentially to premature death.").

187. See *supra* notes 177–178, 181 and accompanying text.

188. See Maxwell J. Mehlman, *Will Directed Evolution Destroy Humanity, and If So, What Can We Do About It?*, 3 St. Louis U. J. Health L. & Pol'y 93, 111 (2009) ("Parents have been allowed to withhold consent to corrective surgery for a child's heart defect; refuse to consent to chemotherapy; deny permission for their children to be given psychotropic drugs even though the parents no longer had custody; and donate a child's kidney to a sibling." (footnotes omitted)).

189. See Lutz, *supra* note 57, at 224–27 (finding the threat to a child's health to be an exception to the parent's right to determine the best interest of the child); Therese Powers, Note, *Race for Perfection: Children's Rights and Enhancement Drugs*, 13 J.L. & Health 141, 154–62 (1998–1999) (providing examples of the limits to parental discretion in cases of civil commitment, abortion, religious exemption from a child's needed medical treatment, and cases in which parents "fail to give their children the necessary care, support, and attention"). Though some describe a state's "duty as *parens patriae* to protect dependent persons from harm," in the case of parental interests, states have remained "reluctant to intrude." *Id.* at 162.

190. See Peter H. Huang, *Herd Behavior in Designer Genes*, 34 Wake Forest L. Rev. 639, 659 (1999) (raising the concern of society seeing children as private property); Pham, *supra* note 153, at 148–49 (addressing concerns of those who worry the "designer

If states could regulate against parental pressures, however extreme, many readers of this Note would have been entitled to state protection from their parents at some point. Parents are routinely permitted to pressure children into difficult, even dangerous, situations.¹⁹¹ However, such moral considerations may not be part of the calculation of the state's interest in a child's well-being.¹⁹² Further, these concerns may be overblown: Genetic essentialism, "the conviction that individual heredity constitutes the essential nature of a person in a way that socially-conditioned influences do not," ignores the fact that both nature and nurture contribute to personal identity, and selecting for certain genetic predispositions should not be viewed as so determinative of the offspring's character.¹⁹³

Nevertheless, one state interest could potentially be compelling enough to warrant restrictions on genetic modification in some cases.¹⁹⁴ When parents seek to intentionally *diminish* the health, mental state, or well-being of the embryo through genetic modification, states may have a compelling interest in preventing harm.¹⁹⁵ As noted in Part I, parents are currently allowed to select for embryos with disabilities such as deafness¹⁹⁶—however, they are not actively *creating* the disability but rather selecting an embryo that could have had no other potential life but one

children" will feel "chosen instead of unconditionally loved" and the negative psychological impact that would ensue); Plummer, *supra* note 22, at 548–49 (arguing modified children will feel "extreme pressures . . . to fulfill their parents' dreams," which could lead to low self-esteem, and concluding that parents looking for designer children "are not prepared for the unconditional love and acceptance essential for parenting"). See generally Long, *supra* note 177 (discussing the ways parents' genetic modifications will create undue pressure on the resulting child).

191. See, e.g., Mehlman, *supra* note 188, at 111 ("Parents . . . place their children at risk when they permit them to play dangerous sports."). Myriad examples come to mind, including parents encouraging children to use performance-enhancing drugs, allowing them to engage in risky athletic behavior, or simply demanding high academic performance of children and punishing children when these high standards are not met. Parents also pay exorbitant amounts for tutors, college counselors, and expensive educational institutions, all of which could conceivably place pressure on children to perform. See, e.g., Georgia Perry, Silicon Valley's College-Consultant Industry, *Atlantic* (Dec. 9, 2015), <http://www.theatlantic.com/education/archive/2015/12/silicon-valley-college-consultants/419538/> [<http://perma.cc/E6UY-V8BY>] (reporting \$400 million spent on college consultants).

192. See *supra* note 138 and accompanying text (finding the state may not assert morality as a compelling interest).

193. Dov Fox, *Silver Spoons and Golden Genes: Genetic Engineering and the Egalitarian Ethos*, 33 Am. J.L. & Med. 567, 594 (2007) [hereinafter Fox, *Silver Spoons*]; see also Huang, *supra* note 190, at 640–41 (noting the genetic blueprint is not as rigid as people view it to be).

194. Any such regulations should be limited to restrictions, not outright bans, so as to be narrowly tailored to the risk at hand.

195. See Robertson, *Procreative Liberty*, *supra* note 91, at 480 ("The right to diminish offspring is simply not coherent as an expression of procreative or familial liberty, for it does not seek to produce healthy offspring who themselves will be fit to reproduce.").

196. See *supra* note 26 and accompanying text (noting PGD allows parents to select for deaf embryos).

without hearing. The state could argue that actively manipulating genes to diminish the capacities of the future life could diminish the child's access to an open future¹⁹⁷ and could cause physical harm to the child that would not have otherwise occurred.

The Court would have to balance the parents' interest in choosing a diminished embryo¹⁹⁸ against the state's interest in protecting such an embryo. This becomes a difficult line-drawing exercise as to what qualifies as a diminishment and to whom. For many in the deaf community, deafness is not a disability but rather a unique trait central to their culture and the way they experience the world.¹⁹⁹ If the Court were to concede that deafness were *not* a diminishment, however, suddenly each diminishment would have to be evaluated under a subjective and indeterminate standard.²⁰⁰ Comparatively, postnatal diminishment remains largely unregulated: Parents regularly make poor parenting decisions as to a child's nutrition, education, and general welfare. However, perhaps the irreversibility of genetic modification raises the state's interest to a compelling level. Though the exact parameters of such a regulation are beyond the scope of this Note, this section concedes a potential role for government regulation in the case of intentional diminishment.

3. *Preserving Health and Well-Being of Society.* — The consequences of genetic modification could have implications for parties beyond the parents and individual embryos involved, though such implications should not, in most cases, justify regulating genetic modification.

197. See Rosato, *supra* note 30, at 108–09 (addressing the breadth of the right to an open-future argument).

198. Such an interest may include a desire to have the child be a member of the same community or a desire to better relate to or care for the child. See, e.g., Sarah Aviles, Note, *Do You Hear What I Hear?: The Right of Prospective Parents to Use PGD to Intentionally Implant an Embryo Containing the Gene for Deafness*, 19 *Wm. & Mary J. Women & L.* 137, 151 (2012) (describing deaf parents' strong interest in having their children be members of the same deaf culture and community).

199. *Id.* at 151–52.

200. One option could be to use the definitions and standards set forth in the Americans with Disabilities Act (ADA) to determine which diminishments rise to the level of causing a disability. See *Americans with Disabilities Act of 1990*, 42 U.S.C. § 12101 (2012). Courts could thus avoid convoluted fact-finding into the exact parameters of particular modifications. See generally Paul L. Barber, Comment, *Prenatal Diagnosis: An Ethical and A Regulatory Dilemma*, 13 *Hous. J. Health L. & Pol'y* 329, 339 (2013) (describing the purpose and role of the ADA). The risk remains, however, that having the Court announce what is and is not a disability—and thus what may and may not be modified—will run counter to the work of disability activists seeking to avoid the pathologization of certain disabilities. See Note, *Regulating Preimplantation Genetic Diagnosis: The Pathologization Problem*, 118 *Harv. L. Rev.* 2770, 2780 (2005) (contending that the “pathologization” problem sends a discriminatory message to those with disabilities, leading to a “heightened intolerance of disability” (internal quotation marks omitted) (quoting Jeffrey R. Botkin, *Ethical Issues and Practical Problems in Preimplantation Genetic Diagnosis*, 26 *J.L. Med. & Ethics* 17, 22 (1998))).

First, a state may argue that the unknown effects on the future gene pool warrant regulating or banning the use of modification: Because germ-line modifications permanently alter DNA, modifications made in any given embryo would become part of the future gene pool.²⁰¹ States may assert an interest in protecting future generations from the unknown risks of altering the genetic pool.²⁰² But this has not been a valid reason in the past—again, antibiotics, vaccines, and other medications that artificially alter the number of people in a population with certain diseases could have unforeseen consequences for future generations.²⁰³ This is not a reason to prevent their use or otherwise halt medical progress. Without compelling data to show an actual adverse effect, a state would not be able to promulgate regulations on speculation alone.

Second, many have expressed a strong concern that genetic modification will destroy genetic diversity and will lead to a “neoeugenic,” or new eugenics, movement, homogenizing the population over time in a discriminatory manner.²⁰⁴ States may seek to restrict genetic modification on the grounds that society will be worse off as a whole because of the harm arising from the homogenization of the population.²⁰⁵ In other words, claiming an interest in genetic diversity, states may argue that state regulation should be permissible to mitigate the risks that could spring from uniform parental choices. However, arguments that such modifications carry a eugenic undercurrent seem overly alarmist, as the modifications are not state sponsored. Parents will most likely create their children in their own image,²⁰⁶ and the diversity of values and priorities

201. See Pham, *supra* note 153, at 154 (“[W]ithout the proper genetic diversity, a virus could wipe out the entire human population.”); Plummer, *supra* note 22, at 554 (arguing the long-term use of modification may create a homogenous population “more susceptible to diseases and environmental changes and other potential unknown consequences”).

202. See Plummer, *supra* note 22, at 554 (expressing concern over the possible effect of modification on the gene pool when that effect negatively alters evolution).

203. See Baffi, *supra* note 5, at 379 (“Even though this line of thought is rational, when taken to its logical conclusion it would also disallow all medicines, surgeries, and even common vaccines because they alter the natural selection of illness.”).

204. See, e.g., Sonia M. Suter, *A Brave New World of Designer Babies?*, 22 Berkeley Tech. L.J. 897, 922–23 (2007) (arguing the voluntary improvement of the human species is still a form of eugenics, though not marked by state coercion); Long, *supra* note 177, at 212 (arguing that this new wave of “eugenics” creates “social pressures that shape our reproductive choices,” leading parental choice to become a mere parental compulsion to conform to homogenous standards).

205. See Huang, *supra* note 190, at 645–53 (arguing parents will exhibit herd-like behavior and fall into patterns of selecting certain forms of modification that will ultimately create a homogenous society and destroy diversity); Kelly, *supra* note 16, at 334–35 (finding the potential for genetic discrimination if “enhanced individuals could have an unfair advantage in competition for scarce societal and economic resources”).

206. Professor Peter Huang appears to find this possibility problematic: “A final possible source of friction along the slippery slope of reprogenetic technology adoption is that parents may desire their children to look and act like the parents themselves.” Huang, *supra* note 190, at 654. It is not clear why this is concerning. Knowing this will be the case

among parents, across cultures and over time, are unlikely to result in this imagined prototypical embryo.

Third, a perhaps related concern is that only the very wealthy will have access to these technologies, exacerbating problems arising from already stark wealth disparities.²⁰⁷ The state may argue that those in positions of privilege will use this technology to perpetuate their own privilege, thereby aggravating the socioeconomic gap and reinforcing certain traits reflective of their values.²⁰⁸ But under a strict scrutiny standard, it would be rather difficult to show enough substantial harm from the cumulative choices of individual parents such that regulation should be allowed.²⁰⁹ Further, as with most technologies, costs will likely drop over time, closing the gap between those who have access to the technologies and those who do not.²¹⁰ Even until this gap closes, this ethical issue is not sufficiently compelling to justify state action, given how the wealth gap already affects parenting across the board.²¹¹ Wealthier parents already have access to private tutoring, robust health care plans, and other resources that give their children a head start, and, as mentioned above, genetic essentialism should not be employed to inflate the impact of genetic modifications over that of these other tools.²¹² Thus, this inequality, however unfair it may feel, should not be found compelling enough to

mitigates concerns that all parents will tend toward one reproductive model. Parents' desires to have children similar to themselves is already reflected both in their parenting styles and in their knowledge that their child will inevitably inherit their genetic code. Thus, genetic modification does not meaningfully enhance a parent's ability and desire to create children similar to himself or herself.

207. See Fox, *Silver Spoons*, supra note 193, at 572 (acknowledging the objection that "limited access to expensive genetic intervention will confer genetic advantages only on those offspring whose parents can afford such techniques" is a "serious one").

208. See Pham, supra note 153, at 155 ("[P]arents would feel compelled to use the technology to ensure that their children will remain competitive with others."); see also id. (finding that because only the wealthy can afford the technology, the "social and economic gap will only get wider").

209. See id. (noting this concern would be relevant only if "implemented on a massive scale, which seems unlikely," meaning "these state interests, taken separately, would be too weak to satisfy strict scrutiny").

210. See Adams, supra note 86, at 169 ("[T]he costs of such technologies often go down, so that they become more accessible by the less well-off, as, in turn, the quality of life of these less well-off people becomes relatively enhanced."); Fox, *Silver Spoons*, supra note 193, at 572 ("The force of the inequality objection would fade to the extent that accesses to genetic engineering were made more equal.").

211. Professor Dov Fox has considered the benefits wealthy parents are already able to bestow upon their children, such as tutoring, camp, and even administration of human growth hormone, permanently changing the child's height. See Fox, *Silver Spoons*, supra note 193, at 578–79. He goes on to emphasize: "Failure to draw a decisive constitutional distinction between prenatal and postnatal childrearing practices supports the analogical case for a due process right to genetic engineering under *Glucksberg*." Id. at 579. Creating a morally or legally relevant distinction between prenatal and postnatal seems unsupportable.

212. See supra note 193 and accompanying text (defining genetic essentialism).

interfere with a parent's right to choose to have a healthy or otherwise modified child.

A final concern briefly deserves attention: a state interest in protecting the well-being of society by preventing outlandish or harmful uses of genetic modification.²¹³ When a parent seeks to harm his or her child by intentionally modifying that child to have clearly outrageous traits—say, by injecting animal genes into a human baby—states have an interest not only in protecting the best interest of the child but also in protecting the community from devolving into an arena for sadistic experimentation. Protecting against such changes should be seen as compelling: They would not be within the spirit of the fundamental right and are not the types of decisions the law should seek to protect.²¹⁴ Determining what would qualify as outrageous is again beyond the scope of this Note, though this section concedes that courts will surely face challenges at the margins in making this determination. Still, unless a mother, offspring, or society as a whole were to face substantial harm, broad fears about how the application of this technology will unfold are insufficiently compelling to justify state action.

CONCLUSION

This Note has argued that if, and likely when, the Supreme Court faces the question of the permissibility of genetic modification, it ought to find a fundamental right to genetically modify one's embryos. Genetic modification raises fascinating ethical questions, and there may be strong ethical motivations to limit certain types of modifications. However, in most cases, there is no principled legal reason to ban or restrict access to genetic modification, as it falls within long-established procreative and parental rights in this nation. As pioneers in the field of genetic modification forge ahead, the Court should protect access to the technology not only to legitimize an important substantive due process right but also to embrace the medical and social benefits that could flow from allowing individuals to choose modification.

213. Consider, for example, the plot of the 1982 film *Blade Runner*, in which an “evil scientist genetically engineers human ‘replicants’ with a limited life span to ‘off-planet’ in menial positions.” Robertson, Procreative Liberty, *supra* note 91, at 480.

214. See Robertson, Genetic Selection, *supra* note 7, at 432 (noting if a modification is “too attenuated or deviant from common understandings of reproductive meaning, courts . . . may not find it material to reproductive choice”).