

Choice v. Chance: The Constitutional Case for Regulating Human Germline Genetic Modification

by NANCY PHAM*

“The final stage is come when Man by eugenics, by pre-natal conditioning . . . , has obtained full control over himself. *Human nature will be the last part of Nature to surrender to Man. The battle will then be won. We shall . . . be henceforth free to make our species whatever we wish it to be. The battle will indeed be won. But who, precisely, will have won it?*”¹

I. Introduction

“First GM [Genetically Modified] Humans Created,” the headlines shouted in May 2001.² Researchers at the Institute for Reproductive Medicine and Science of St. Barnabas in New Jersey announced that the first genetically altered humans “have been born and are healthy.”³ “Specifically, these researchers transplanted ooplasm from donor eggs into the eggs of [infertile] women” with defective ooplasm.⁴ The transplant inadvertently resulted in the transfer of mitochondrial DNA (“mtDNA”) containing a small amount of additional genes not inherited from either biological parent.⁵ Though the transplant was technically a successful human germline intervention, human germline genetic modification

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1. CLIVE S. LEWIS, *THE ABOLITION OF MAN* 59 (2001).
2. Joe Cummins & Mae-Wan Ho, *First GM Humans Created*, ISIS NEWS, July 2001, <http://www.i-sis.org.uk/isisnews/i-sisnews9-4.php>.
3. David Whitehouse, *Genetically Altered Babies Born*, BBC NEWS ONLINE, May 4, 2001, <http://news.bbc.co.uk/2/hi/science/nature/1312708.stm>.
4. Cummins & Ho, *supra* note 2.
5. *Id.*

(“HGGM”)⁶ normally refers to techniques performed to create a permanent inheritable genetic change in offspring and future descendants by intentionally altering the genetic makeup of the human germline⁷ or early human embryos.⁸

Researchers have not yet attempted intentional HGGM, but inheritable genetic modifications have been successful in animals dating back to the first genetically altered mouse in 1976.⁹ With the rapid rate of advancing technology as well as the promise of artificial human chromosomes (“HACs”) and retroviral techniques, human germline intervention may be possible in the near future.¹⁰ Though HGGM is not yet a reality, many infertile couples have already utilized preimplantation genetic diagnosis (“PGD”) to achieve similar results.¹¹ PGD refers to the procedure involved in obtaining a genetic diagnosis prior to embryo implantation in conjunction with in vitro fertilization (“IVF”).¹² After the diagnosis is obtained, only the healthy embryos are implanted and brought to full term.¹³ Following the PGD, parents can choose the gender of their children and even screen out genetic defects.¹⁴ The results of PGD do not affect future generations but do implicate some of the fears and concerns of germline intervention such as the lack of regulation, slippery slope to eugenics,¹⁵ devaluation of human life, and constrained choice and free will of the resulting child.

6. For the purpose of this note, the terms “human germline intervention,” “human inheritable genetic modification,” “human germline genetic modification” will be used synonymously to refer to manipulations to the human genome that will be inherited by all future descendants.

7. Germline means eggs, sperm, and the cells that give rise to eggs and sperms.

8. For a summary of the science behind HGGM, see SUSANNAH BARUCH, HUMAN GERMLINE GENETIC MODIFICATION: ISSUES AND OPTIONS FOR POLICYMAKERS 11-20 (2005), available at <http://www.dnapolicy.org/images/reportpdfs/HumanGermlineGeneticMod.pdf>.

9. For more examples of inheritable genetic modifications done on animals, see Institute on Biotechnology and the Human Future, <http://www.thehumanfuture.org/topics/germlineintervention/background.html#research> (last visited Oct. 14, 2006).

10. See, e.g., Kevin R. Smith, *Gene Therapy: The Potential Applicability of Gene Transfer Technology to the Human Germline*, 1(2) INT’L J. MED. SCI. 79 (2004); Steve Connor, *Science & Technology: Creating the Stuff of Life*, THE INDEP. (UK), March 16, 2005.

11. Sherry F. Colb, *Pre-Implantation Genetic Diagnosis: Should Our Laws Allow Parents to Pre-Screen Their Children?*, FINDLAW, Nov. 30, 2005, <http://writ.news.findlaw.com/colb/20051130.html>.

12. *Id.*

13. *Id.*

14. *Id.*

15. *Id.*

This note will examine whether access to HGGM technology is a constitutionally protected right¹⁶ focusing on a traditional substantive due process analysis¹⁷ and then further addressing alternative arguments set forth in several¹⁸ Supreme Court cases—since it is unclear which test the Court would apply.¹⁹ Under traditional substantive due process, constitutional protection turns on whether the right is fundamental.²⁰ If the courts deem human germline intervention fundamental, then it would fall in line with the category of reproductive decision-making cases such as *Griswold v. Connecticut*.²¹ Moreover, such a classification would require states to have a compelling interest before restricting the right at all.²² However, if human germline intervention is not a fundamental right, then states must only show a legitimate interest under rational basis review.²³ I argue that HGGM will be deemed unconstitutional under the traditional substantive due process law because: (1) courts will not recognize HGGM as a fundamental right based on current case law; and (2) even if it were a fundamental right, state regulation would meet the compelling interests test.

Alternatively, under the undue burden analysis implemented in *Planned Parenthood v. Casey*, because the standard set by the Court is so ambiguous, it is hard to determine whether HGGM laws will be upheld or invalidated.²⁴ In addition, I will analyze HGGM as a liberty interest as set forth in *Lawrence v. Texas*.²⁵ Then I will discuss some of the state interests involved and whether the Court will find them sufficient based on the

16. For a constitutional analysis of PGD and sex selection, see Rachel E. Remaley, Note, "The Original Sexist Sin": Regulating Preconception Sex Selection Technology, 10 HEALTH MATRIX 249 (2000).

17. I use the term "traditional substantive due process" to refer to the substantive due process analysis used in *Roe v. Wade*, 410 U.S. 113 (1973), which asks if the right in question is fundamental.

18. The alternatives to traditional substantive due process include the undue burden analysis delineated in *Planned Parenthood v. Casey*, 505 U.S. 833 (1992) and the liberty interest discussed in *Lawrence v. Texas*, 539 U.S. 558 (2003).

19. The Supreme Court's analysis of substantive due process has been murky, with a shift from analyzing privacy rights to liberty interests. Thus, I will discuss each test and the resulting implications.

20. *Roe*, 410 U.S. at 152.

21. 381 U.S. 479 (1965).

22. Also known as strict scrutiny. See *Roe*, 410 U.S. at 155.

23. See, e.g., U.S. Dep't of Agric. v. Moreno, 413 U.S. 528, 533 (1973); *San Antonio Indep. Sch. Dist. v. Rodriguez*, 411 U.S. 1, 17 (1973).

24. See David L. Faigman, *Madisonian Balancing: A Theory of Constitutional Adjudication*, 88 NW. U. L. REV. 641, 643 (1994).

25. 539 U.S. 558 (2003).

analysis applied. Further, I will consider what means of regulation states can implement without violating the Constitution. Finally, this note will address policy considerations and regulation. Ultimately, society needs some sort of regulation to guide these burgeoning technologies that have the potential to literally change the human race.

II. The Constitutional Framework

According to one law professor, “constitutional adjudication is in a state of disarray.”²⁶ Because no one is sure what analysis the Supreme Court would currently apply to HGGM, this note will discuss each potentially implicated constitutional test.²⁷

A. Traditional Substantive Due Process and Fundamental Rights

In a line of procreative liberty cases beginning with *Griswold*,²⁸ the Supreme Court has “recognized that a right of personal privacy, or a guarantee of certain areas or zones of privacy, does exist under the Constitution.”²⁹ The Court specifically located this right to privacy in the Fourteenth Amendment’s conception of personal liberty and restrictions upon state action—often referred to as substantive due process. The personal privacy guarantee only protects “fundamental” personal rights.³⁰ However, this privacy right is not absolute. Regulations limiting these rights can be justified by a compelling state interest; any legislation must be narrowly drawn to express only the legitimate state interest implicated (strict scrutiny review).³¹ On the other hand, if the personal right is not fundamental, then it undergoes rational basis review, under which states may restrict that right in order to satisfy any legitimate state interest.³²

Courts have traditionally recognized reproductive decisions as fundamental; thus, they fall under the privacy guarantee. The Court first recognized the fundamental nature of reproduction in *Skinner v. Oklahoma*,

26. Faigman, *supra* note 24, at 643.

27. For an alternative constitutional analysis to the ones examined in this note, *see id.* Faigman suggests a constitutional adjudication that balances the depth of the full constitutional infringement, an aggregate of all rights, with the government’s justification for its action.

28. *Griswold v. Connecticut*, 381 U.S. 479, 484 (1965). The Court stated that “specific guarantees in the Bill of Rights have penumbras, formed by emanations from those guarantees that help give them life and substance. Various guarantees create zones of privacy” (internal citations omitted). *Id.*

29. *Roe v. Wade*, 410 U.S. 113, 152 (1973).

30. *Id.*

31. *Id.* at 155.

32. *See, e.g., U.S. Dep’t of Agric. v. Moreno*, 413 U.S. 528, 533 (1973); *San Antonio Indep. Sch. Dist. v. Rodriguez*, 411 U.S. 1, 17 (1973).

by invalidating a criminal law and characterizing reproduction as “one of the basic civil rights of man.”³³ The Court went on to state that “[m]arriage and procreation are fundamental to the very existence and survival of the race.”³⁴ The Court expanded the protection in the pivotal contraception case, *Griswold v. Connecticut*, by striking down legislation which prevented married couples from obtaining contraceptives.³⁵ Using the privacy right later summarized in *Roe* the Court noted that “the Connecticut anti-use statute invades a protected area of privacy and association or that it demeans the marriage relationship.”³⁶ The Court explicitly applied the privacy guarantee to reproduction—for the first time in *Griswold*—but because the statute only applied to married couples, it was unclear whether the privacy right extended outside the marital context. In *Eisenstadt v. Baird*, the Supreme Court addressed the question unanswered in *Griswold*: “If the right of privacy means anything, it is the right of the individual, married or single, to be free from unwarranted governmental intrusion into matters so fundamentally affecting a person as the decision whether to bear or beget a child.”³⁷ Finally, the Court held that the right of privacy was “broad enough to encompass a woman’s decision whether or not to terminate her pregnancy” in its landmark decision legalizing abortion.³⁸

These cases make clear that procreative liberty, specifically the decision whether or not to have a child, is a fundamental right falling under the privacy guarantee located within traditional substantive due process. Any state legislation in this realm, therefore, triggers strict scrutiny and requires a state to demonstrate a compelling interest before it may regulate.

1. *Is HGGM a Fundamental Right Warranting Strict Scrutiny?*

Before we can assess if HGGM is a fundamental right that fits within the procreativity liberty framework, we must define “fundamental right.” In *Michael H. v. Gerald D.*, the Supreme Court noted that “fundamental” is a concept that is hard to objectify, but that a fundamental interest is one “traditionally protected by our society.”³⁹ The Court further explained that the Due Process Clause affords only those protections “so rooted in the

33. 316 U.S. 535, 541 (1942).

34. *Id.*

35. *Griswold v. Connecticut*, 381 U.S. 479, 503 (1965).

36. *Id.*

37. 405 U.S. 438, 453 (1972).

38. *Roe v. Wade*, 410 U.S. 113, 153 (1973); *see also* *Planned Parenthood v. Casey*, 505 U.S. 833 (1992).

39. 491 U.S. 110, 122 (1989).

traditions and conscience of our people as to be ranked as fundamental.”⁴⁰ The Supreme Court also emphasized that “respect for the teachings of history [and a] solid recognition of the basic values that underlie our society” are necessary before a right is classified as fundamental.⁴¹ Other decisions have categorized rights as fundamental when the “right involved is of such a character that cannot be denied without violating those fundamental principles of liberty and justice which lie at the base of all our civil and political institutions.”⁴²

According to Vanderbilt University Professor of Law and Biological Sciences Owen Jones, this line of reasoning suggests a two-part inquiry to determine whether a right will be recognized as fundamental: (1) historical evidence of our society’s traditional protection of the right; and (2) evidence indicating that the right is a basic societal value.⁴³ Under Jones’ first prong, the right to HGGM would fail to be fundamental because society has never traditionally protected an individual’s right to genetically modify a child. Applying Jones’ second prong, the end result of HGGM—having a genetically healthy child—may be a basic societal value. However, the means of obtaining that result, genetic manipulation, is not necessarily a basic societal value. In fact, many U.S. researchers who generally support the advancement of technology have criticized the production of genetically altered children.⁴⁴

The language of the reproduction cases suggests that our basic societal values may not support genetic modification. *Skinner*, which underscored reproduction as a basic right of man, is not dispositive because having children is distinguishable from having children a certain way (e.g. determining traits).⁴⁵ Likewise, the language in *Eisenstadt* is to “beget a child.”⁴⁶ Clearly there is a difference between passing on one’s own genes and being able to use genetic manipulation to create a child according to one’s own preferences. The former entails a basic human right to replicate;

40. *Id.* (internal quotations omitted).

41. *Id.* at 122-23 (internal quotations omitted).

42. *Griswold v. Connecticut*, 381 U.S. 479, 493 (1965) (internal quotations omitted).

43. Owen Jones, *Sex Selection: Regulating Technology Enabling the Predetermination of a Child’s Gender*, 6 HARV. J. L. & TECH. 1, 37 (1992).

44. Whitehouse, *supra* note 3. Many scientists deem human genetic modification to be unethical, especially because of the limitations of our current knowledge about the procedure and the human germline in general. In addition, scientists criticize researchers that conduct these modifications privately, without the public’s knowledge or approval, thus sneaking human germline modification through the back door.

45. Michael H. Shapiro, *Does Technological Enhancement of Human Traits Threaten Human Equality and Democracy?*, 39 SAN DIEGO L. REV. 769, 833 (2002).

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

the latter an additional power to control the terms of that replication.⁴⁷ The ability to pass on more than half of one's genes—such as modifying a gene to increase intelligence—goes beyond what ordinarily occurs in reproduction and should, therefore, fail to receive the substantive due process protection enjoyed by traditional reproduction.⁴⁸

Additionally, *Roe* and *Casey* were decided not only on values of procreative liberty, but also on rules of bodily integrity.⁴⁹ That is, bodily integrity was doing some of the work along with a woman's right to make reproductive decisions. However, bodily integrity plays no part in genetic modification. Unlike the right to abortion, without which a woman would bear the burden of physically carrying her child to term, a woman who chooses HGGM would already have made the decision to bear the burden of physically carrying her child to term. Since HGGM raises no bodily integrity issue, the Supreme Court has less rationale for categorizing access to HGGM as a fundamental right.

Another factor to consider is how the relevant right is defined. The manner in which the Court frames the right is crucial because the level of generality is often dispositive of whether the right is fundamental.⁵⁰ For example, in *Bowers v. Hardwick*, the majority classified the right as the right to engage in "homosexual sodomy"⁵¹ rather than the right to engage in the intimate association of one's choosing, as suggested by the dissent.⁵² This narrowly framed right was likely dispositive in the Court's decision to uphold Georgia's criminal sodomy statute. However, the Court overruled *Bowers* when it adopted a broader view of the same right in *Lawrence v. Texas*. There, the Supreme Court classified the right as "intimate conduct."⁵³ Some argue that *Lawrence* signals the death of the narrow approach to defining rights,⁵⁴ but cases still remain where the Court

47. Jones, *supra* note 43, at 39.

48. John A. Robertson, *Procreative Liberty in the Era of Genomics*, 29 AM. J. L. & MED. 439, 472 (2003).

49. *Planned Parenthood v. Casey*, 505 U.S. 833, 857 (1992).

50. See LAURENCE H. TRIBE & MICHAEL C. DORF, ON READING THE CONSTITUTION 73-112 (1991).

51. 478 U.S. 186, 188 (1986).

52. *Id.* at 201 (Blackmun, J., dissenting).

53. *Lawrence v. Texas*, 539 U.S. 558, 579 (2003).

54. Laurence H. Tribe, *Lawrence v. Texas: The "Fundamental Right" That Dare Not Speak Its Name*, 117 Harv. L. Rev. 1893, 1898-99 (2004) (noting that the *Lawrence* Court took the *Bowers* Court to task for the way it had formulated the question for decision and altering the historical trajectory of substantive due process).

adopted a narrow approach like the one in *Bowers*.⁵⁵ Furthermore, the Court has the discretion to use whichever definition it sees fit, whether broad or narrow. As applied to HGGM, the right could be defined broadly as “the right to make decisions regarding reproduction” or more narrowly as “the right to genetically modify one’s child.” The category of rights that includes HGGM is probably most accurately described as “the right to choose the genetic or physical characteristics of one’s child using alternate reproductive technology.”⁵⁶ Indeed, the preceding analysis assumed a definition like this one to determine that HGGM would not likely be recognized as a fundamental right.

Instead, if the right to HGGM was defined broadly as “the right to make decisions regarding reproduction,” then it would fit neatly into the procreative liberty cases described thus far. Since this is a somewhat disingenuous classification of HGGM,⁵⁷ because it is radically different from traditional reproduction, I will hereinafter analyze HGGM assuming the appropriate categorical definition to be “the right to choose the genetic or physical characteristics of one’s child using alternate reproductive technology.”⁵⁸

Even under this more narrow definition, it is possible for the Supreme Court to find that HGGM is a fundamental right.⁵⁹ If HGGM were recognized as a fundamental right, the designation would likely rest on how “centrally or intimately connected” HGGM is to reproductive decision-making.⁶⁰ For example, if parents would only have a child if that child could be genetically modified, then the choice to use HGGM “would be presumptively protected under the principles that underlay the Court’s decisions and dicta to date [regarding reproduction], and be subject to limitation only if [its] use posed great harm to others.”⁶¹

55. See, e.g., *Washington v. Glucksberg*, 521 U.S. 702, 708 (1997) (defining the right as “physician-assisted suicide” rather than a broader classification such as the right to die, and using a traditional analysis similar to that in its *Bowers* opinion).

56. Jodi Danis, *Sexism and “The Superfluous Female”: Arguments for Regulating Pre-Implantation Sex Selection*, 18 HARV. WOMEN’S L.J., 219, 248 (1995).

57. See *id.* at 247 (noting that Professor Tribe “recognizes that an extremely broad definition of a relevant right is not always the appropriate solution to the problem of specificity”).

58. *Id.* at 248.

59. See John B. Attanasio, *The Constitutionality of Regulating Human Genetic Engineering: Where Procreative Liberty and Equal Opportunity Collide*, 53 U. CHI. L. REV. 1274, 1285-87 (1986).

60. Robertson, *supra* note 48, at 454.

61. *Id.*

Furthermore, surveys reveal that a majority of Americans approve of HGGM to avoid fatal childhood disease or avoid adult-onset disease.⁶² Indeed most, if not all, parents wish to have a child free of genetic abnormality and disease.⁶³ In addition, parents can legally use PGD followed by non-implantation of unsatisfactory embryos (e.g., undesired gender, genetic disease) or prenatal screening and abortion to bear only children with desired traits. In fact, there is no legislation restricting these technologies, which suggests that the public may also desire that HGGM be similarly unrestricted. Americans may consider HGGM a preferable and more humane alternative to PGD and selective abortions, as HGGM involves manipulation of the early embryo rather than the discarding of unwanted embryos or abortion of existing fetuses.

Ultimately, the Supreme Court is unlikely to classify HGGM as a fundamental right because it is radically different from traditional reproduction and does not involve a woman's bodily integrity, which was part of the rationale in *Roe* and *Casey*. Indeed, the Court noted in *Roe* "that the protected sphere of liberty does not include all childbearing activity."⁶⁴ Even if parents claimed that they would not have children without genetic modification, thus arguably affecting their decision to procreate in the first place, the Court is still unlikely to view HGGM as a fundamental right because the parents' reproduction and their children's reproduction could easily occur without resort to genetic enhancement.⁶⁵

Moreover, constitutional challenges to PGD that may justify state restriction weaken the argument to recognize HGGM as a fundamental right based on the nation's acceptance of PGD.⁶⁶ Additionally, the lack of regulation regarding PGD could be viewed as an administrative oversight rather than as societal approval of the technology. Affirmatively modifying

62. Baruch, *supra* note 8, at 31 (the Center's 2004 survey of 4,834 Americans found that 57 percent approved of HGGM to avoid fatal childhood disease, while 51 percent approved of HGGM to avoid adult-onset disease).

63. The desire to have children free of genetic disease or abnormalities (the removal of negative traits) is defined as therapeutic germline intervention, while using germline intervention for enhancement is the addition of positive traits such as increased intelligence or attractiveness. This may be an important distinction in regulating HGGM, but the line distinguishing the two can often be blurred.

64. See Attanasio, *supra* note 59, at 1287 ("[Earlier decisions] also make it clear that the right has *some extension* to activities relating to marriage, . . . procreation, . . . contraception, . . . family relationships . . . and child rearing and education" (quoting *Roe v. Wade*, 410 U.S. 113, 152-53 (1973)) (emphasis added and citations omitted)).

65. Robertson, *supra* note 48, at 478.

66. See Remaley, *supra* note 16 (arguing that even if PGD was protected as a fundamental right, there are compelling state interests that justify restrictions of the technology).

a child's germline, which will affect all descendants, is radically different from choosing not to have a specific child via PGD or abortion.

Finally, the Court has been hesitant to extend the sphere of fundamental rights,⁶⁷ and would be even less likely to extend it to such a radically new and different technology with such far-reaching effects. Therefore, the Supreme Court most likely will not find that HGGM is a fundamental right protected under substantive due process. As such, strict scrutiny would not apply and the states would not need to show a compelling interest in order to regulate the use of HGGM.

2. *Rational Basis Review*

If the Supreme Court does not recognize HGGM as a fundamental right, it will use a rational basis review to evaluate the constitutionality of a law that restricts HGGM. Rational basis review asks if the legislation is "rationally" related to a "legitimate" state interest.⁶⁸ This is a very deferential standard which merely questions whether a law is irrational or arbitrary. Alternatively, the Court has recently applied a slightly more searching version of rational basis review, which some have termed "rational basis with bite."⁶⁹

Under traditional rational basis review, the Court will uphold a statute unless it is completely arbitrary, even if finding a rational basis requires the Court to "supply its own purpose to justify the statute."⁷⁰ In contrast, under rational basis with bite, the Court will not defer to the legislature and will actually examine the state's interests justifying the regulation.⁷¹ As I argue below, states will likely be able to comply with strict scrutiny and

67. Thomas Stuart Patterson, Note, *The Outer Limits of Human Genetic Engineering: A Constitutional Examination of Parents' Procreative Liberty to Genetically Enhance Their Offspring*, 26 HASTINGS CONST. L.Q. 913, 926 (1999). The author notes that the Court has upheld state laws that: (1) refuse to fund abortions from welfare; (2) prohibit using public facilities to perform abortions; (3) prohibit public employees from performing abortions; while invalidating state laws that require waiting periods and parental notification for minors. *Id.* at 926 n.114. See also *Washington v. Glucksberg*, 521 U.S. 702, 735 (1997) (upholding a ban on physician-assisted suicide by tailoring the right so narrowly that it was not deemed fundamental and by applying rational basis review).

68. See, e.g., *U.S. Dep't of Agric. v. Moreno*, 413 U.S. 528, 533 (1973); *San Antonio Indep. Sch. Dist. v. Rodriguez*, 411 U.S. 1, 17 (1973).

69. Gayle Lynn Pettinga, Note, *Rational Basis with Bite: Intermediate Scrutiny by Any Other Name*, 62 IND. L.J. 779, 787 (1987).

70. *Id.*

71. See, e.g., *City of Cleburne v. Cleburne Living Ctr.*, 473 U.S. 432 (1985) (applying rational basis with bite and striking down a statute burdening the right of the mentally retarded to live in a group home); *Goodridge v. Dep't of Pub. Health*, 798 N.E.2d 941 (Mass. 2003) (implementing rational basis with bite to strike down a state law prohibiting same-sex partners from obtaining marriage licenses).

demonstrate a compelling state interests for restricting HGGM even if HGGM is classified as a fundamental right. Consequently, rational basis review and even rational basis with bite will be met as well as these thresholds are much lower than that of strict scrutiny.

B. Alternatives to Traditional Substantive Due Process and Fundamental Rights

The Supreme Court has employed means of analysis other than substantive due process to adjudicate constitutional rights. Constitutional jurisprudence is murky precisely because the Court has implemented these different tests and it is difficult to pinpoint which test it might use.

1. Undue Burden

One alternative constitutional analysis is the “undue burden” test, which the Court applied in *Planned Parenthood v. Casey*.⁷² There, the Court held that an undue burden “exists, and therefore a provision of law is invalid, if its purpose or effect is to place a substantial obstacle in the path of a woman seeking abortion”⁷³ Performing an undue burden analysis, however, is problematic because the test is unclear. What exactly is a substantial obstacle? What population should the Court use in the analysis? Indeed, the lack of clarity was evident in the opinion itself, as Justices O’Connor, Kennedy and Souter upheld a twenty-four hour waiting period while simultaneously invalidating a spousal notification provision, even though “the quantum of evidence was virtually the same as to whether either posed a ‘substantial obstacle’ to the exercise of the abortion right.”⁷⁴ The undue burden standard is indefinite at best and could result in HGGM regulation being upheld or invalidated with equal likelihood.⁷⁵

Furthermore, before the undue burden analysis can be applied to HGGM regulation, the Court will first have to recognize access to HGGM as a right on par with the right to abortion.⁷⁶ As discussed in the previous

72. 505 U.S. 833, 877-78 (1992). In *Casey*, the Court restructured the right to abortion at the same time that it purportedly upheld *Roe*. The Court divided pregnancy into pre-viability and post-viability stages. During pre-viability, a state may regulate abortion as long as it does not place an “undue burden” on the woman’s decision to abort. *Id.* at 877. During post-viability, states may regulate to the extent of proscribing abortion (except where necessary to preserve the life or health of the mother). *Id.* at 878. The Court upheld Pennsylvania’s informed consent provisions, a twenty-four hour waiting period, a one-parent consent requirement (with a judicial bypass provision), certain record-keeping requirements, and struck down a spousal notification requirement. *Id.* at 881-901.

73. *Id.* at 877.

74. Faigman, *supra* note 24, at 643.

75. *See infra* Part III.

76. *See Jones, supra* note 43, at 40.

section,⁷⁷ the language of the Court's decisions to date casts doubt on whether it would equate the two rights. It is also unclear whether the Supreme Court will apply the undue burden analysis outside the context of abortion.

2. *Liberty*

In *Lawrence v. Texas*, the Supreme Court invalidated a Texas sodomy statute⁷⁸ defining the relevant right as "intimate conduct."⁷⁹ The Court then proceeded to search history and foreign sources to attempt to find a justification for recognizing the right as fundamental (although the Court never used that word).⁸⁰ The Court ultimately declared that the Texas statute "furthers no legitimate state interest."⁸¹ In a confusing twist, despite the fact that the Court searched history in order to recognize intimate conduct, including homosexual sex, as a fundamental right—which should have triggered strict scrutiny—the Court instead invoked rational basis review.⁸²

Randy E. Barnett, the Austin B. Fletcher Professor of Law at Boston University, proposes a reading of *Lawrence* that makes sense of the Court's analysis.⁸³ He notes that the *Lawrence* majority did not protect a "right of privacy," but instead protected "liberty."⁸⁴ For example, the majority stated, "the case should be resolved by determining whether the petitioners were free as adults to engage in the private conduct in the exercise of their *liberty* under the Due Process Clause of the Fourteenth Amendment to the Constitution."⁸⁵ In fact, the word "liberty" appears twenty-five times in the majority opinion,⁸⁶ from which Barnett concludes that "liberty, not privacy is doing all the work."⁸⁷ What he calls the "presumption of liberty" changes the burden of proof and "requires the government to justify its restriction on liberty, instead of requiring the citizen to establish that the

77. See *supra* Part II.A.1.

78. 539 U.S. 558, 579 (2003).

79. *Id.* at 567.

80. *Id.* at 568-74.

81. *Id.* at 578.

82. See *id.* ("The Texas statute furthers no *legitimate* state interest which can justify its intrusion into the personal and private life of the individual.") (emphasis added).

83. Randy E. Barnett, *Justice Kennedy's Libertarian Revolution: Lawrence v. Texas*, 2003 CATO SUP. CT. REV. 21.

84. *Id.*

85. *Lawrence*, 539 U.S. at 564 (emphasis added).

86. Barnett, *supra* note 83, at 34.

87. *Id.*

liberty being exercised is somehow ‘fundamental.’”⁸⁸ Under this liberty analysis, “once an action is deemed to be a proper exercise of liberty . . . the burden shifts to the government.”⁸⁹ In *Lawrence*, the only rationale the state offered to justify the statute was their belief that sodomy was immoral; which for the majority was simply not enough to justify the restriction of liberty.⁹⁰

Assuming the Supreme Court finds the use of HGGM a proper exercise of liberty,⁹¹ the only guide under this analysis is that morality alone is not sufficient to justify its regulation. Since most of the states’ interests in restricting HGGM⁹² are stronger than the morality rationale,⁹³ they would likely be sufficient to warrant regulation of the liberty interest.⁹⁴

III. State Interests and Means of Regulation

States have numerous compelling and legitimate interests that, depending on the test or analysis applied, would justify legislation banning or substantially limiting HGGM. As Professor Ann MacLean Massie notes, there is a distinction between belief and conduct, the latter of which potentially harms third parties.⁹⁵ Although in the abortion context the Court has recognized a First Amendment right to “define one’s own concept of existence, of meaning, of the universe, and of the mystery of human life,”⁹⁶ in the past, laws have been upheld despite religious objections because to do otherwise would cause harm to others.⁹⁷ In other words, where unfettered reproductive liberty causes harm, states may constitutionally regulate that liberty.

88. *Id.* at 36.

89. *Id.*

90. *Id.*

91. If HGGM is not classified as a proper exercise of liberty, which may be the case since it is so new and has an effect that could harm the genetically modified child and his descendants, then there is no constitutional protection, and states are free to regulate as they please.

92. Here, I assume that HGGM would be recognized as a proper exercise of liberty. Of course, if it is not, the analysis ends and states may freely regulate HGGM.

93. These include protecting the health, safety, and Fourteenth Amendment personhood rights of children. See *infra* Part III.

94. Note that *Glucksberg*, which uses the traditional substantive due process analysis, is still good law. There, the Court framed the relevant right narrowly as “the right to assisted suicide” and then held that it was not fundamental. 521 U.S. at 708. Thus it is unclear whether the Court would rely on traditional substantive due process or their *Lawrence* analysis in examining the constitutionality of HGGM. It could indeed fall back on traditional substantive due process.

95. Ann MacLean Massie, *Regulating Choice: A Constitutional Law Response to Professor John A. Robertson’s Children of Choice*, 52 WASH. & LEE L. REV. 135, 154 (1995).

96. *Casey*, 505 U.S. at 851.

97. Some examples are anti-polygamy, anti-child labor, and universal immunization laws.

Under traditional substantive due process, there are two tiers of review as already discussed. First, if a right is fundamental, then strict scrutiny applies and any regulation must be narrowly tailored to advance a compelling state interest. Second, if the right is not fundamental, then rational basis review applies, and any regulation must be rationally related to a legitimate state interest—a very minimal threshold under which most statutes pass constitutional muster. As an alternative to the traditional substantive due process analysis, the Court could apply two different tests. The first is “rational basis with bite,” which is more exacting test than traditional rational basis review but less searching than strict scrutiny. The second is the liberty analysis set forth in *Lawrence*, which requires a legitimate state interest before the government can restrict an individual’s liberty—essentially rational review—assuming the right is classified as a proper exercise of liberty.

I will now describe some possible state interests and means of regulation, analyzing each according to the preceding framework to determine if the interest is sufficient to justify state regulation. This note will not focus on the undue burden analysis because that analysis turns on whether the legislation creates a substantial obstacle for individuals rather than focusing on the state interest.⁹⁸

A. State Interests in Protecting the Genetically Modified Child

1. Safety Risks

“Even the strongest enthusiasts agree that no existing method of altering genes in embryos is sufficiently safe and effective to attempt in humans.”⁹⁹ Findings in animal studies cast further doubt on whether the technology would be safe in humans. For instance, there are problems

98. Because the undue burden analysis focuses on whether the regulation is an “undue burden” or a “substantial obstacle,” no balancing against a state interest is implicated. If the restriction is an undue burden, then the regulation will presumably be invalidated. Therefore, the state interests will not be examined in light of the undue burden analysis. Instead the analysis focuses on the effects of the law in question. Application of the undue burden analysis requires an initial assumption that the Court will treat HGGM as the equivalent of the abortion right. Then, if the law created an outright ban on HGGM, it would most likely be a substantial obstacle to HGGM. However, if the law permitted parents to use HGGM only after a review board determines it is in the child’s best interest, based on specific congressional guidelines, the Court could easily hold the law is not an undue burden. The Court’s decision would depend on the particular law, and as noted previously, the decision could be arbitrary because the undue burden analysis is indefinite.

99. Rebecca Dresser, *Designing Babies: Human Research Issues*, IRB: ETHICS & HUMAN RESEARCH, Sept.-Oct. 2004, at 3.

regarding “low efficiency and low rate of integration into the genome.”¹⁰⁰ One GFP study conducted on monkeys, a species with a genetic makeup that closely matches the human genome, “resulted in only one live birth out of forty implanted embryos actually expressing the gene.”¹⁰¹ Researchers can identify effective GFP procedures because the altered genes glow under a special light.¹⁰² Thus, researchers can study the presence or absence of the GFP in the tissues and organs of the resulting offspring.¹⁰³ Only one monkey (2.5 percent of implanted embryos) “was born with the altered GFP gene present in all tissues, although no fluorescence was observed.”¹⁰⁴ This suggests that the newly introduced genes functioned poorly or not at all, demonstrating that the technique is “not yet refined enough to be useful.”¹⁰⁵

“In addition to the low initial gene implantation and expression rates evinced in the GFP studies, there are also problems that manifest later in the life of the animals following the event of successful gene integration.”¹⁰⁶ “Genes expressed in wrong tissues or in the developmental stage may have deleterious effects on the proper functioning of the cell, tissues, or organ, causing problems such as developmental complications, sterility, and cancer.”¹⁰⁷

In light of the current state of medical technology, HGGM is unsafe and could likely lead to illness and potentially to premature death. If HGGM was recognized as a fundamental right under traditional substantive due process, these safety risks would probably rise to the level of a compelling state interest. Not only is the safety of the genetically modified individual at risk, but also that individual’s entire line of descendants. As such, the state interest in protecting these individual’s safety should be sufficient to meet strict scrutiny.¹⁰⁸ If these safety concerns are sufficient to satisfy strict scrutiny, then they must, by definition, also satisfy rational basis review and rational basis with bite. HGGM supporters could argue that these safety risks will improve with more research and be a non-issue in the future. However, the state of the technology *now* poses serious risks

100. Institute on Biotechnology and the Human Future, *supra* note 9.

101. *Id.*

102. *Id.*

103. *Id.*

104. *Id.*

105. *Id.*

106. *Id.*

107. *Id.*

108. See Cass R. Sunstein, *Is There a Constitutional Right to Clone?*, 53 HASTINGS L.J. 987, 998 (2002) (reasoning that similar safety concerns involved in human cloning would satisfy even the most stringent standard of review).

to the genetically modified child, so much so that HGGM would surely be regulated if not banned completely.¹⁰⁹

Even a total ban on HGGM might be considered narrowly tailored enough to pass constitutional muster due to the immense safety risks and hazards of HGGM.¹¹⁰ Alternatively, a total ban might be overly broad, especially if the technology advances to the point that safety risks are dramatically reduced. In such a case, one possible narrowly tailored restriction is to prohibit HGGM for enhancement purposes while allowing it for therapeutic purposes. Therapeutic HGGM would eliminate negative traits such as genetic abnormalities and disease. In contrast, enhancement HGGM would add positive traits such as increased athleticism or intelligence. Because HGGM done for therapeutic purposes would eliminate abnormalities and potentially life threatening disease, the Supreme Court might find that this benefit would outweigh safety risks. Thus, the Court might find a law that allows therapeutic HGGM while prohibiting genetic enhancements to be narrowly tailored to advance the compelling state interest in safety.

Under the liberty analysis, once an action is deemed to be a proper exercise of liberty,¹¹¹ the burden shifts to the government to justify its restriction on that liberty.¹¹² Since *Lawrence* only required a legitimate state interest, safety risks that endanger the genetically modified individual's life will likely be sufficient to restrict HGGM. Indeed, health and safety concerns regarding HGGM are much stronger justifications for restricting liberty than the immorality rationale at work in *Lawrence*. Therefore, safety risks would likely be sufficient to justify nearly any restriction of HGGM. However, since the Court's language speaks only of restrictions, it would probably invalidate a complete ban because it does more than restrict but rather fully bars access to HGGM.

2. *Psychological and Mental Well Being*

Many believe that allowing HGGM will lead to designer children who are chosen instead of unconditionally loved. As one commentator put it, trait specification will lead to a "contingency devaluation risk" with the previous unconditional acceptance of the children we produce giving way

109. See generally Dresser, *supra* note 99 (discussing the safety risks of HGGM generally as well as the safety standards necessary in order to experiment with inheritable genetic modifications on humans).

110. Sunstein, *supra* note 108, at 998.

111. For the remainder of Part III, I will assume that the Supreme Court will find HGGM to be a proper exercise of liberty, making the liberty analysis applicable.

112. Barnett, *supra* note 83, at 36.

to an acceptance contingent on the success of our genetic design attempts, as measured by the success of the persons designed.¹¹³ Arguably, this conditional acceptance, inherent in HGGM and a valuation based on success, may affect the psychological health of genetically modified children, as parents choose and evaluate their children instead of accepting and unconditionally loving them.

However, this harm is largely speculative, because it is difficult to predict how a genetically modified child will react. Perhaps the child will view his parents' decision to genetically modify him as an act of love. This is especially true if the modification eliminated a genetic disorder. Because the psychological harm is so speculative, the Court might hold that regulating it is not a compelling state interest under strict scrutiny. In contrast, psychological harm and mental well-being may satisfy rational basis review since it is an extremely deferential standard. The Supreme Court will likely find protecting genetically modified children from psychological harm a legitimate state interest, thus permitting states to regulate HGGM. This interest will also likely survive rational basis with bite, as the interest in protecting children is weighty and a restriction is not arbitrary if it will prevent the harm. Likewise, the Court will likely allow state regulation of HGGM if it applies the liberty analysis, which also only requires a legitimate state interest.

3. Sanctity of Life

Professor Laurence Tribe proposes that reproductive technologies, which allow for trait selection and children molded by preference such as HGGM, may threaten "the concept and the reality of the human person as a unique and intrinsically valuable entity."¹¹⁴ People would no longer be inherently and uniquely worthy and special. Instead, genetically modified children—and all of humanity—would be reduced to a catalogue of ideal traits, such as athleticism, intelligence, and beauty. Since this interest is moral in nature, it will not survive strict scrutiny¹¹⁵ but may satisfy rational basis review or rational basis with bite when considered with additional state interests. Under the liberty analysis, the Supreme Court will invalidate any law restricting access to HGGM based on sanctity of life, a reflection of morality, just as it struck down the statute in *Lawrence*.

113. Michael H. Shapiro, *Fragmenting and Reassembling the World: Of Flying Squirrels, Augmented Persons, and Other Monsters*, 51 OHIO ST. L.J. 331, 348-49 (1990).

114. Laurence H. Tribe, *Technology Assessment and the Fourth Discontinuity: The Limits of Instrumental Rationality*, 46 S. CAL. L. REV. 617, 648 (1973).

115. *Lawrence v. Texas*, 539 U.S. 558, 577 (2003).

B. The Genetically Modified Child's Fourteenth Amendment Personhood Rights

Since the purpose of HGGM is to create a living child, that child has constitutional rights under the Fourteenth Amendment. When a parent chooses to genetically modify a child, the modification will then be passed along to all future descendants as well. Thus, these rights include autonomy in its bodily integrity, which must be recognized and protected.¹¹⁶ Unlike *Roe* and other abortion cases, in which the Court did not recognize a fetus as a person under the Fourteenth Amendment, HGGM's purpose is to create a living child rather than to terminate the life of a fetus before its rights can be taken into account. In fact, the Court held in *Casey* that "the State has legitimate interests from the outset of the pregnancy in protecting . . . the life of the fetus that may become a child."¹¹⁷ Because the use of HGGM produces a living child, states have an even stronger compelling interest in protecting that child. To dismiss the genetically modified child's rights by saying that it is better to be born than not, as Professor Robertson argues in *Children of Choice*,¹¹⁸ "makes too short a shrift of a concern central to the reproductive technologies debate—namely, what we should do to ensure the physical, mental, and psychological well-being of the children whom we are deliberately bringing into existence."¹¹⁹

To recognize its rights only after the child is born would be too late because the germline intervention will have already been performed and the genetic destiny of the child and all of her descendants will already be set in stone. The compelling state interest is not in fetal life, but in the life of a child who will be born and that child's free will and self-determination. Cases from various fields of law demonstrate that genetically modified children have rights even before they would qualify for personhood under the Fourteenth Amendment.

116. The *Skinner* Court reaffirmed a right to personal autonomy and a more specific right of bodily integrity. *Skinner v. Oklahoma*, 316 U.S. 535, 546 (1942) (limiting the extent to which the state may conduct biological experiments at the expense of the dignity and personality of the individual).

117. *Planned Parenthood v. Casey*, 505 U.S. 833, 846 (1992).

118. JOHN A. ROBERTSON, *CHILDREN OF CHOICE: FREEDOM AND THE NEW REPRODUCTIVE TECHNOLOGIES* (1994).

119. Massie, *supra* note 95, at 145.

1. Tort Law

Historically in tort law, a fetus (or parents of the fetus) could not recover for injuries unless it was injured after the point of viability.¹²⁰ Over time, the courts recognized that, after birth, these children were forced to live with debilitating conditions due to the negligent actions that affected them while in the womb—despite the age or development of the child at the time of injury.¹²¹ The courts explained that “[w]hether viable or not at the time of the injury, the child sustains the same harm after birth, and therefore should be given the same opportunity for redress.”¹²² As long as the child was born, there was a valid cause of action even if the injury occurred prior to viability.

The courts have gone even further in recognizing tortious actions against fetuses by allowing a mother to recover for an injury that harmed a future born child even if the injury was sustained before conception. As Professor Lori Andrews notes,¹²³ “the court [in *Renslow v. Mennonite Hospital*] reasoned that the cases allowing recovery for pre-viable injuries have held that a defendant may be liable to a being whose existence was not apparent, the same type of negligent conduct should not escape liability simply because it occurred two weeks or two years prior to conception.”¹²⁴ The *Renslow* court explicated the underlying impetus behind preconception torts as the “right to be born free from prenatal injuries foreseeably caused by a breach of duty to the child’s mother.”¹²⁵ Just as tort law recognizes a duty to the fetus even before it exists (preconception), the state should be able to protect the child’s interest even before it is conceived, at the point when the parents are deciding to proceed with an inheritable genetic modification.

2. Property Law

Property law has always recognized even an unborn individual’s right to inherit. For example, with a fee simple absolute (usually designated with the words “to O and his heirs”), the owner’s heirs automatically

120. For a general discussion of the status of the fetus within tort law, see Matthew Browne, Note, *Preconception Tort Law in an Era of Assisted Reproduction: Applying a Nexus Test for Duty*, 69 *FORDHAM L. REV.* 2555 (2001).

121. Lori B. Andrews, *The Legal Status of the Embryo*, 32 *LOY. L. REV.* 357, 381 (1986-87) (“The first court to reject viability as a rule was the New York Supreme Court Appellate Division in the 1953 case of *Kelly v. Gregory*, 282 A.D. 542, 125 N.Y.S. 2d 696 (1953).”).

122. *Smith v. Brennan*, 157 A.2d 497, 504 (N.J. 1960).

123. Lori Andrews is also the Co-founder of the Institute on Biotechnology and the Human Future.

124. Andrews, *supra* note 121, at 383.

125. *Renslow v. Mennonite Hosp.*, 367 N.E. 2d 1250, 1255 (Ill. 1977).

inherit the property if he dies intestate.¹²⁶ The owner's grandchild will eventually inherit—as long as the property is not sold—even though the grandchild may not exist during the lifetime of the owner. Similarly, with a trust, a settlor can designate legal benefits and rights to an unborn individual—even creating a perpetual dynasty.¹²⁷ Thus, property law recognizes limited property interests of the unborn. At a minimum, a person may designate an unborn child to inherit or participate in his estate.¹²⁸ This recognition of conceptus property rights further supports allowing states to protect the child's rights before the genetic modification is done.

3. *Parent Versus Child Rights*

Parents have a constitutional right to raise children the way they see fit,¹²⁹ but the state can limit and regulate these rights.¹³⁰ In this way, children have an ambiguous status in that they have independent personhood rights yet are dependent on their parents.¹³¹ The Supreme Court has generally protected parental autonomy in child-rearing decisions,¹³² which includes decisions where children will live, how they will be educated, and what values and morals they will be taught.¹³³ However, there are limitations on parental control; parents cannot fully control their children's existence once they are born.¹³⁴ Although the decision to genetically modify a child is made prior to birth, HGGM would dramatically effect the child's life, future, and even descendants because parents would have already pre-determined certain characteristics of the child.¹³⁵ This severe effect after the child's birth warrants limiting parental rights before the child is born.¹³⁶

126. T. BERGIN & HASKELL, PREFACE TO ESTATES IN LAND AND FUTURE INTERESTS, 23-26 (1966).

127. Brian Layman, *Perpetual Dynasty Trusts: One of the Most Powerful Tools in the Estate Planner's Arsenal*, 32 Akron L. Rev. 747, 748 (1999).

128. Andrews, *supra* note 121, at 393.

129. See, e.g., *Pierce v. Soc'y of Sisters*, 268 U.S. 510 (1925) (invalidating a law which prohibited children from attending private schools); *Meyer v. Nebraska*, 262 U.S. 390 (1923) (striking down a law which banned teaching children languages other than English).

130. For example, parents cannot abuse their children.

131. John A. Robertson, *Genetic Selection of Offspring Characteristics*, 76 B.U. L. REV. 421, 480 (1996).

132. See, e.g., *Pierce*, 268 U.S. 510; *Meyer*, 262 U.S. 390.

133. Robertson, *Genetic Selection*, *supra* note 131, at 481.

134. *Id.* at 479-80.

135. Note that the Supreme Court had held that "a parent's desire for and right to 'the companionship, care, custody, and management of his or her children' is an important interest that 'undeniably warrants deference and, absent a powerful countervailing interest, protection.'"

Indeed, “parents are trustees of their children’s separate welfare, not owners of their personhood.”¹³⁷ Parents must provide minimal care such as food, water, shelter, and education or else they will lose their parental rights.¹³⁸ States have a compelling interest in ensuring children become healthy, functioning members of society, which justifies the restriction on a parent’s childrearing rights. Courts have even limited parental choices in child-rearing based upon decisions that go beyond minimal care: for example, parents can be prevented from using harsh disciplinary practices to instill a specific religious belief,¹³⁹ and from fostering hatred of the other parent.¹⁴⁰ These cases demonstrate that once a child is born, the state can protect the child’s interests even if that means restricting a parent’s child rearing and First Amendment rights. Because the use of HGGM can produce a child with genetic predeterminations from which they need protection, parental rights to use HGGM should be restricted.

The above areas of law suggest that the genetically modified child has individual interests that states should be allowed to protect by restricting use of HGGM. Protecting the child’s Fourteenth Amendment personhood rights probably rises to a compelling state interest sufficient to meet strict scrutiny. This is especially true since the genetic modification would substantially affect the individual and his future descendants by predetermining such traits as appearance, personality, and intelligence. If this state interest is sufficient to satisfy strict scrutiny, then by definition it would also satisfy rational basis review and rational basis with bite.

Lassiter v. Dep’t of Soc. Servs., 452 U.S. 18, 27 (1981) (quoting Stanley v. Illinois, 405 U.S. 645, 651 (1972)).

136. The child rearing rights of parents are an alternative way to analyze HGGM outside of procreative liberty. See *Meyer*, 262 U.S. 390. Here, the Supreme Court’s limits on parental rights is used in the context of affirming the importance of, and the necessity in, states protecting a child’s Fourteenth Amendment personhood rights rather than in weighing the child rearing parental rights (including HGGM) against state intervention—the alternate analysis. See also *Danis*, *supra* note 56, at 249-50 (applying the child-rearing analysis to sex selection); Jason C. Glahn, *I Teach You the Superman: Why Congress Cannot Constitutionally Prohibit Genetic Modification*, 25 WHITTIER L. REV. 409, 430-34 (2003) (arguing that the child rearing analysis is stronger than reproductive liberty analysis); Patterson, *supra* note 67, at 929-31 (arguing that parental rights regarding HGGM would not be protected).

137. Robertson, *Genetic Selection*, *supra* note 131, at 481.

138. See CAL. PENAL CODE § 270 (West 2004) (penalizing a parent who “willfully omits. . . to furnish necessary clothing, food, shelter, or medical attendance, or other remedial care for his or her child”); *Prince v. Massachusetts*, 321 U.S. 158, 166 (1944) (stating that “it is a cardinal with us that the custody, care and nurture of the child reside first in the parents”). The author is indebted to Robertson’s *Genetic Selection*, *supra* note 131, at 481 n.243 for these references.

139. *Peterson v. Peterson*, 474 N.W.2d 862 (Neb. 1991).

140. See *Schutz v. Schutz*, 581 So.2d 1290 (Fla. 1991).

The Supreme Court might find an outright ban to be sufficiently narrowly tailored to advance the compelling state interest of protecting the genetically modified child from severe and unchangeable limitations imposed by his parents. A ban would be necessary to stop all genetic changes to which the child did not consent. Alternatively, the Court could see an outright ban as overly broad because it would prevent parents from eliminating genetic defects or diseases that would substantially limit or shorten the child's life. In this case, the Court might validate a state law that prohibited HGGM for enhancement purposes but allowed HGGM for therapeutic purposes that would save or lengthen the life of the child.

Since strict scrutiny is likely satisfied, and thus also rational basis review and rational basis with bite, the Court will probably allow state regulation of HGGM if it applies the liberty analysis, which only requires a legitimate state interest.

C. Public Interests

1. Genetic Diversity

The human species is continually evolving and adapting. Unfettered application of inheritable genetic modifications to alter human traits may undermine the evolutionary progress of the species.¹⁴¹ If widely implemented, HGGM may decrease genetic variation, which is our species' greatest defense.¹⁴² Reduced diversity could prove disastrous for humans. For instance, without the proper genetic diversity, a virus could wipe out the entire human population.¹⁴³ The use of HGGM to tailor children and all descendants would reduce genetic diversity since parents would likely choose similar desired traits such as increased intelligence. Deselected traits could prove to be adaptive and beneficial in the future, but the human race will have lost the ability to adapt based on decisions to manipulate the gene pool today. Because each of the possible public interest arguments are substantially similar, I will discuss the means of regulation of them together after describing them separately.

141. Barry Brown, *Human Cloning and Genetic Engineering: The Case for Proceeding Cautiously*, 65 ALB. L. REV. 649, 659 (2002).

142. Lori B. Andrews, *Is There a Right to Clone? Constitutional Challenges to Bans on Human Cloning*, 11 HARV. J. L. & TECH. 643, 656 (1998) ("Genetic adaptation has allowed the human species to survive; producing genetically identical humans may therefore be threatening to the species.").

143. See John R. Harding Jr., *Beyond Abortion: Human Genetics and the New Eugenics*, 18 PEPP. L. REV. 471 (1991).

2. *Eugenics*

The use of HGGM also raises the danger of eugenics—the quest to create the perfect race.¹⁴⁴ Parents who use HGGM to increase their child's intelligence or physical ability are indeed agents of eugenics under the guise of desiring the best for their children. They are in fact manipulating their children to attain their ideal of perfection not unlike Hitler and his Nazi compatriots. Nazi Germany was tempted by the eugenic ideal, even though it did not have the genetic capabilities that are possible today. Thus, the danger is far greater than it was in Nazi Germany or in early 20th century America. People all over the globe are already implementing PGD and IVF technology to choose the sex of their children.¹⁴⁵ Eugenics cannot be much further behind.

3. *Socioeconomic Divide*

If states do not regulate HGGM, then there is no incentive for parents not to seek genetic enhancements.¹⁴⁶ If HGGM use is widespread, then parents would feel compelled to use the technology to ensure that their children will remain competitive with others. However, only the wealthy can currently afford the technology. As such, the current social and economic gap will only get wider.¹⁴⁷

The state interests in protecting genetic diversity, preventing eugenics, and not exacerbating the socioeconomic divide would only be truly relevant were HGGM implemented on a massive scale, which seems unlikely. Thus, these state interests, taken separately, would be too weak to satisfy strict scrutiny and may not even be sufficient to meet rational basis with bite or rational basis review. However, taken together they may be enough to rise to the level of a legitimate interest that justifies state regulation under rational basis with bite and rational basis review. Similarly, if the Court uses the liberty analysis, the combination of these interests might rise to a sufficient legitimate interest as required by *Lawrence*. Thus, state restriction on HGGM based on the public interest might be warranted, albeit weakly.

144. Attanasio, *supra* note 59, at 1306 n.162 (“Sir Francis Galton, who coined the term ‘eugenics,’ believed that its aim was to give to the more suitable races or strains of blood a better chance of prevailing speedily over the less suitable than they otherwise would have had.”) (internal quotation marks omitted).

145. Danis, *supra* note 56, at 241-42 (“Because sex is analogous to these latter attribute genes, the advent of sex selection forebodes widespread genetic manipulation for the fulfillment of mere preference.”).

146. Robertson, *supra* note 48, at 479.

147. Attanasio, *supra* note 59, at 1306.

The Supreme Court has found that “states have a compelling interest in protecting the life, health, and safety of their citizens.”¹⁴⁸ Whether the numerous state interests are enough to justify state regulation depends on the analysis the Court applies. If HGGM is recognized as a fundamental right under traditional due process, then the Court will subject the regulation to strict scrutiny. The Court will likely only find an outright ban on HGGM to be narrowly tailored when the state interest is in protecting the health, safety, or Fourteenth Amendment personhood rights of the state’s children. Even with these compelling interests, the Court may find an outright ban too broad. Regulation that prohibits HGGM for enhancement purposes, however, will likely be narrowly tailored to meet the rigid standard of strict scrutiny.

In the alternative, if the Supreme Court does not rule that HGGM is a fundamental right, then it will apply rational basis review, rational basis with bite, or the liberty analysis as a substitute for traditional substantive due process. Under these fairly minimal standards, nearly all of the state interests discussed would satisfy the legitimate interest required. Since it is very probable that the Supreme Court will not categorize the use of HGGM as a fundamental right, states will be free to regulate the use of HGGM with few limitations.

IV. The Time Is Now—Implementing Policy and Regulation

States will likely be able to regulate HGGM without violating an individual’s constitutional rights. Depending on the standard applied and the state interest involved, a total ban on the technology could be upheld while restrictive laws will definitely be sustained in nearly all cases. The next question that arises is how states should effectuate their laws. The Genetics and Public Policy Center proposed a good framework to address policy and regulation.¹⁴⁹

A. Total Ban

Many believe that the safety and associated risks of HGGM are far greater than the potential benefits; and thus a complete ban is warranted.¹⁵⁰ Advocates of a ban fear that the technology will be used to create “designer babies” with improved traits and abilities, which could have negative effects on society—such as fostering eugenics, commodification of human

148. Robertson, *Genetic Selection*, *supra* note 131, at 428 n.29; *see, e.g.*, Moore v. Sims, 442 U.S. 415, 435 (1979) (finding that removing child abuse victims from their parents is a compelling interest).

149. Baruch, *supra* note 8, at 43.

150. *Id.*

life, and decreased genetic diversity.¹⁵¹ Under this line of reasoning, the benefits to the small number of couples who would use HGGM to avoid serious genetic disease need to be balanced against the safety concerns and the risks to the future of humanity.¹⁵² For supporters of a complete ban, the balance tips in favor of the safety concerns of humankind.

Several methods could be used to ban HGGM in the United States.¹⁵³ Congress or state legislatures could pass a law prohibiting the use of HGGM.¹⁵⁴ In the alternative, the Food and Drug Administration (“FDA”) could create a policy that does not allow clinical research using HGGM to proceed.¹⁵⁵ Without further clinical testing, researchers could not prove HGGM safe, thus effectively banning the technology altogether.

The United Nations could also play a role in implementing a worldwide ban through an international convention against HGGM.¹⁵⁶ George Annas, a professor of law at Boston University, and his peers have drafted a “Convention on the Preservation of the Human Species,” which could serve as the model for a United Nations ban.¹⁵⁷ Such a treaty would prohibit HGGM because it is a “species-altering” technology.¹⁵⁸ This global approach attempts to preserve the “human species” by preventing HGGM scientists from shopping for a “home country” with the most lenient laws.¹⁵⁹

B. Regulate

Regulation of HGGM will ensure the safety of the technology and its ethical use, preventing against potential abuses.¹⁶⁰ The FDA or the Recombinant DNA Advisory Council (“RAC”) would be good government bodies, already in existence, to oversee the use of HGGM.¹⁶¹ These agencies will need to address the long-term outcomes of the genetically modified children as well as the welfare of future descendants perhaps via

151. *Id.*

152. *Id.*

153. *Id.*

154. *Id.*

155. *Id.*

156. *Id.*

157. *Id.*

158. *Id.*

159. George J. Annas, Lori B. Andrews, & Rosario M. Isasi, *Protecting the Endangered Human: Toward an International Treaty Prohibiting Cloning and Inheritable Alterations*, 28 AM. J. L. & MED. 151, 151-78 (2002).

160. Baruch, *supra* note 8, at 44.

161. *Id.* at 44-45.

federally funded and controlled longitudinal studies.¹⁶² Additionally, the agencies must also set safety standards both for clinical research and for actual application of the technology.¹⁶³ Furthermore, these bodies will need to set limits on the use of HGGM. For example, they could specifically bar all enhancement use of HGGM and allow HGGM only in circumstances designed to eliminate fatal genetic diseases or those genetic diseases that seriously affect the quality of life.¹⁶⁴

Finally, the FDA or RAC will likely need to address equity and justice concerns, perhaps passing laws to ensure equal access to HGGM.¹⁶⁵

V. Conclusion

Under a traditional substantive due process analysis, the Supreme Court will not likely recognize HGGM as a fundamental liberty interest because it is not a traditional form of reproduction. Thus, the courts will likely use the less demanding rational basis review or rational basis with bite to determine the constitutionality of state regulation of the technology. However, even if the courts did recognize HGGM as a fundamental liberty interest, there are a few compelling state interests that could satisfy strict scrutiny, such as safety of the genetically modified child and the child's Fourteenth Amendment individual rights. Because strong compelling interests exist which justify regulation, the states may be able to institute an outright ban HGGM; but it is more likely that they will be able to regulate the technology.¹⁶⁶ For instance, states could pass laws prohibiting the use of enhancement HGGM.

Society and technology are advancing at astounding rates. No longer is abortion the only critical and controversial procreative liberty issue. Reproductive liberty rights are headed in the direction of genetic modification. As a society, we must address the ethical, legal, and social implications of HGGM before an irrevocable usage of HGGM occurs. How we choose to oversee HGGM has important implications for other technology, such as the recent explosion of nanotechnology as applied to

162. *Id.* at 44.

163. *See Dresser, supra* note 99.

164. Baruch, *supra* note 8, at 45.

165. *Id.* Note that this would raise funding concerns such as whether or not states would be required to subsidize the technology.

166. States would be able to regulate under strict scrutiny, rational basis review, rational basis with bite, and the liberty analysis. *See supra* Part III.

transhumanism.¹⁶⁷ Will the human race continue to be unheedingly shaped by chance or by the choice of imperfect human beings? C.S. Lewis warned that if humans attain the power to shape descendants, “all men who live after it are the patients of that power . . . [and are] weaker, not stronger.”¹⁶⁸ The future of the human race is in our hands.

167. For a general discussion of nanotechnology, *see* Institute on Biotechnology and the Human Future, Nanotechnology, http://www.thehumanfuture.org/themes/101_nano.htm (last visited last visited Oct. 14, 2006).

168. Lewis, *supra* note 1, at 57.
