

# THE EXPRESSIVE IMPACT OF PATENTS

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## ABSTRACT

*Patents represent a quid pro quo between the public and the inventor: in exchange for disclosing the invention, the inventor receives the right to exclude others from practicing her invention. They therefore serve as a source of technical information. Patents also communicate information to markets and companies that serve to reduce various transaction costs, allowing more efficient transactions and investment. Patents consequently communicate various types of information beyond the technical.*

*There is no reason, however, that such messages must be limited to the technical or the pecuniary. This Article explores whether patents, like other governmental acts such as legislation, can create expressive harms. The grant of a patent could communicate a message of inferiority to groups whose identity is tied to their biology. The article analyzes this potential through the paradigm of granting patents on a “gay gene” or other biological process that predisposes a person toward a homosexual orientation. Other conditions implicated by my thesis are the deaf, dwarfs, and high-functioning autistics. These groups do not regard themselves as pathological or in need of “curing,” yet genetic discoveries offer the potential for their elimination through what is effectively privatized eugenics. The grant of a patent on such technologies affords the government’s imprimatur of such controversial technologies.*

*The Article first reviews the scientific status of homosexuality. It then explores whether patents regarding sexual orientation could be a moral signal of inferiority by the government by suggesting that gays and lesbians are pathological. Finally, the Article offers various prescriptions to address this problem.*

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*What may be considered normal for one individual may be decidedly abnormal for another; and who is there among us who can decide which of the two is normal and which abnormal?*<sup>1</sup>

## I. INTRODUCTION

Patents traditionally have been justified on the basis of incentives. Commentators have identified three different incentive systems that underlie the patent system: quid pro quo, ex ante, and prospect theories. Under the quid pro quo view, the patent acts as an incentive for the innovator to disclose the invention to the public in exchange for the patent's exclusive rights.<sup>2</sup> On the most basic level, the patent's disclosure communicates a message to the public about what the inventor has discovered and how to make and use that discovery.<sup>3</sup> According to the ex ante incentive view, patents are needed to combat the "public good problem of information", namely, without patents, competitors could free-ride on the invention and compete with the innovator without incurring the research and development costs.<sup>4</sup> Such free-riding reduces the ex ante incentive to invest in innovation. The third view, prospect theory, contends that patents create the incentive to commercialize the invention after the patent has issued.<sup>5</sup> By defining the property right surrounding the invention, the inventor can best coordinate later commercialization of the good in a way akin to prospecting of mineral rights.<sup>6</sup>

Recent scholarship has persuasively challenged these paradigmatic views and has demonstrated that patents perform functions far different from these basic incentives. Patents can operate as a vehicle for transmitting messages. For example, patents can serve as a signal to markets about aspects of the firm. A robust, diverse collection of patents, known as a patent portfolio, can send a signal to the market about the

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1. Abraham L. Wolbarst, *Sexual Perversions: Their Medical and Social Implications*, 134 MED. J. & REC. 5, 5 (1931), quoted in ERIN G. CARLSTON, "A Finer Differentiation": Female Homosexuality and the American Medical Community, 1926-1940, in SCIENCE AND HOMOSEXUALITIES 175, 184 (Vernon A. Rosario ed., 1997).

2. See Timothy R. Holbrook, *Possession in Patent Law*, 59 SMUL. REV. 123, 125 (2006).

3. 35 U.S.C. § 112 (2000). For a general discussion of disclosure obligations and various structural flaws in the patent system that mitigate its ability to serve as a source of technical information, see Holbrook, *supra* note 2, at 131-46.

4. Mark A. Lemley, *Ex Ante Versus Ex Post Justifications for Intellectual Property*, 71 U. CHI. L. REV. 129, 129 (2004); see also Holbrook, *supra* note 2, at 132-35.

5. See Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 266 (1977).

6. *Id.*

nature of a firm's innovation capacity or other factors relevant to potential investors.<sup>7</sup> Signaling and portfolio theory both suggest that patents act as intermediaries, translating otherwise complicated information into simpler forms to allow the markets to operate more efficiently. Patents communicate other information in order to reduce transaction costs: they can facilitate affirmative asset partitioning by firms and combat "team production" problems arising in efforts by firms to develop and exploit information assets.<sup>8</sup> Patents consequently serve a far greater communicative role than simply revealing the technical information regarding the invention and the scope of the exclusionary rights.

This reality is not surprising. Property rights often involve issues of communication, messages, and symbols.<sup>9</sup> The need for notice of property rights among parties necessitates a common language of communication and expression of ownership rights and their parameters.<sup>10</sup> Property rights are more than simply the ability to exclude others. In order for property rights to function efficiently, others must be able to recognize the scope of those rights and understand what is and is not permitted. Conflicts and litigation can arise when two parties do not understand the messages communicated by property rights. If someone does not understand that a fence means "do not enter," she may not realize that it is impermissible to enter the property. Similarly, customs of a given community can afford quasi-property rights, which can easily be misunderstood by outsiders. The messages and signals consequently are necessary elements of any functioning property system.

Patents, as a form of property, undeniably act in ways to facilitate signaling and communication beyond their disclosures, but they differ from other forms of property in a significant way: they are granted by the U.S. government after a substantive review of an application. An inventor must demonstrate that she has satisfied the patentability requirements<sup>11</sup>

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7. See Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625, 636–37 (2002); Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 U. PA. L. REV. 1, 4–9 (2005).

8. Paul J. Heald, *A Transaction Costs Theory of Patent Law*, 66 OHIO ST. L.J. 473, 480–99 (2005).

9. See, e.g., Carol M. Rose, *Crystals and Mud in Property Law*, 40 STAN. L. REV. 577, 610 (1988) (discussing how property rules implicate community communications); Carol M. Rose, *Possession as the Origin of Property*, 52 U. CHI. L. REV. 73, 83–85 (1985) [hereinafter *Rose, Possession*].

10. Rose, *Possession*, *supra* note 9, at 84–85; Henry E. Smith, *The Language of Property: Form, Context, and Audience*, 55 STAN. L. REV. 1105, 1108 (2003).

11. The PTO will grant a patent if the invention is of eligible subject matter, has utility, is novel, and is nonobvious. 35 U.S.C. §§ 101–03 (2000). The inventor's application also must adequately disclose the invention. 35 U.S.C. § 112 (2000).

and is thus entitled to a patent, which the United States Patent and Trademark Office (PTO) confirms by issuing the patent. The fact that the patent is a grant of a right by the government enhances the signal of the patent document. The government's imprimatur helps to convey the signal with greater clarity and confidence. The patent has credibility behind it because of the government's imprimatur.<sup>12</sup> Unlike other forms of property, therefore, the signal from a patent is necessarily intermingled with expressions of the government's approval.

There is no reason that these signals are limited to technical and pecuniary considerations, as the previous literature suggests.<sup>13</sup> The government imprimatur attending the patent grant can confirm the technical and, potentially, moral legitimacy of a technology.<sup>14</sup> In particular, the genetic revolution has resulted in discoveries linking genes, proteins, and other biological processes to human behavior generally.<sup>15</sup> Research into biological causes of behaviors is inevitable and, indeed, has already begun.<sup>16</sup> Recent discoveries include genes that influence aggressiveness,<sup>17</sup> weight,<sup>18</sup> intelligence,<sup>19</sup> novelty-seeking, worry<sup>20</sup> and harm avoidance.<sup>21</sup> One scientist has noted that "[t]he real breakthroughs in understanding personality are not occurring on leather couches but in laboratories."<sup>22</sup> Another has suggested that "[t]he genetic analysis of behavior will prove to be . . . the most important advance in the behavioral

12. Margo A. Bagley, *Patent First, Ask Questions Later: Morality and Biotechnology in Patent Law*, 45 WM. & MARY L. REV. 469, 475-76 (2003); Peter Lee, Note, *Patents, Paradigm Shifts, and Progress in Biomedical Science*, 114 YALE L.J. 659, 676 (2004).

13. See *supra* notes 7-8 and accompanying text.

14. Lee, *supra* note 12, at 676.

15. DEAN HAMER & PETER COPELAND, *LIVING WITH OUR GENES: WHY THEY MATTER MORE THAN YOU THINK* 301 (1998) [hereinafter HAMER & COPELAND, *LIVING*] ("What often goes unsaid is that the genes being discovered also include ones that define behavior. Virtually every aspect of how we act and feel that has been studied in twins shows genetic influence, and many of the individual genes have been isolated."); Rochelle Cooper Dreyfuss & Dorothy Nelkin, *The Jurisprudence of Genetics*, 45 VAND. L. REV. 313, 320 (1992).

16. FRANCIS FUKUYAMA, *OUR POSTHUMAN FUTURE* 24 (2002) ("But it seems almost inevitable that we will know much more about genetic causation [of behaviors] even if we never fully understand how behavior is formed."); DEAN HAMER & PETER COPELAND, *THE SCIENCE OF DESIRE* 187 (1994) [hereinafter HAMER & COPELAND, *DESIRE*] ("The discovery of a genetic link to homosexuality is bound to be followed by discoveries of links to countless other aspects of personality.")

17. See, e.g., U.S. Patent No. 6,165,716 (filed Sept. 3, 1998); U.S. Patent No. 5,418,162 (filed Oct. 14, 1992).

18. HAMER & COPELAND, *LIVING*, *supra* note 15, at 9.

19. *Id.* at 10.

20. *Id.* at 11.

21. *Id.* at 55.

22. *Id.* at 25.

sciences in [his] lifetime.”<sup>23</sup> Many of these discoveries are patentable, and the government grant of a patent on these technologies could signal approbation of such technologies. Although patents relating to genetically based diseases are desirable, patents on genes and processes that influence behaviors, activities, or conditions that are not clearly harmful could be problematic.<sup>24</sup> These discoveries may result in the ability to manipulate or choose preferential traits, a form of privatized eugenics.<sup>25</sup> The PTO inevitably will grant patents on biological discoveries with such eugenic potential. The imprimatur of the patent grant can express the view that such technologies are legitimate and normatively good. Moreover, patents in these areas beg the question of whether we want the patent system to create an incentive for these types of discoveries.

Much of this debate centers on the requirement that a patented invention have utility. Patents are awarded only for inventions that are useful. Utility, however, is a relative concept: what is good for one could be destructive to another. This concern is particularly acute for groups whose identities are tied to their biological state or behaviors: the invention could be used to destroy these groups by “curing” them or by preventing their birth through prenatal screening. The grant of patents on these technologies confirms that the government views them favorably and could express that these groups are highly disfavored, further marginalizing them.

The expressive dimension of intellectual property has been explored previously in trademark law<sup>26</sup> but not in patent law. The Lanham Act proscribes granting federal trademark registration to a mark that is

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23. Richard C. Pillard, *The Search for a Genetic Influence on Sexual Orientation*, in SCIENCE AND HOMOSEXUALITIES 226, 237 (Vernon A. Rosario ed., 1997).

24. Admittedly, what constitutes a “disease” is infected with the public’s view of undesirability. SIMON LEVAY, QUEER SCIENCE 213–14 (1996) [hereinafter LEVAY, QUEER SCIENCE] (“[V]alues are intrinsic to the definition of disease. Most especially, it has been claimed that a key feature of a disease is its undesirability, although opinions differ as to *by whom* and *for whom* . . . the disease is judged undesirable.”).

25. See generally 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 (2005).

26. Copyright, arguably the intellectual property right most closely associated with expression, ironically does not encounter these types of problems. For one, at least in the United States, copyright must coincide with the First Amendment. Denial of copyright protection based on expressive content could violate free speech protections. Second, and more importantly from an expressive perspective, copyrights are further removed from state action because the copyright is created the instant the original work is created. While a copyright can be registered with the Copyright Office, such registration is not required for the grant of the copyright. The government need not review the work to determine whether it satisfies the conditions of originality. Given this distance from governmental action, the idea that a copyright could convey an expressive message with respect to governmental views of a group is not well founded.

immoral or scandalous.<sup>27</sup> Denying registration does not require the applicant to stop using the mark and therefore does not preclude use of the mark. Instead, denial merely creates a disincentive for the owner to continue using the mark due to the lack of protection. But that is not a strong disincentive—nothing prohibits the applicant from continuing to use the mark. Indeed, if a company has already invested considerable resources into promoting the mark, the company likely will continue to use it. The primary reason for denying the trademark registration in this context, therefore, is the potential that the government would be viewed as approving of such a scandalous mark.<sup>28</sup> The concern of the government sending the wrong message is purely an expressive consideration.<sup>29</sup>

This Article argues that patents also possess the potential to express governmental preferences for, disfavor towards, or even condemnation of various members of society. The recent discoveries into human biology portend discoveries that relate to various conditions that are central to a person's identity. The deaf, for example, do not view their condition as a pathological condition in need of curing: to them, they are simply a linguistic minority. Similar concerns have been expressed by others, such as high-functioning autistics and little people. Patents on discoveries related to such conditions would communicate the message that "curing"<sup>30</sup>

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27. 15 U.S.C. § 1052(a) (2000).

28. Although the Trademark Trial and Appeal Board has denied that registration can act as providing government imprimatur, see *In re Old Glory Condom Corp.*, 26 U.S.P.Q.2d (BNA) 1216, 1220 n.3 (T.T.A.B. 1993) (rejecting as erroneous the "concern that the issuance of a trademark registration for applicant's mark amounts to the awarding of the U.S. Government's 'imprimatur' to the mark"), it has provided no other policy or theoretical justification for this exclusion. The lack of a justification begs the question of why the "immoral" or "scandalous" restriction is in the Lanham Act. The TTAB has hidden behind its role of applying the statutory requirements but does not explain why the requirements, as a policy matter, are there in the first place. The legislative history suggests that Congress wanted to discourage the use of such marks. *Hearings on H.R. 4744 Before the Subcomm. on Trademarks of the H. Comm. on Patents*, 76th Cong. 18 (1939) [hereinafter *Hearings*] (statement of Rep. Thomas E. Robertson); see also Kimberly A. Pace, *The Washington Redskins Case and the Doctrine of Disparagement: How Politically Correct Must A Trademark Be?*, 22 PEPP. L. REV. 7, 22 (1994). Denying registration, though, does not prevent a mark's use. Thus, the only conceivable basis is to avoid giving the "stamp of approval" of an immoral or scandalous mark through the granting of a federal right. Cf. GRAEME B. DINWOODIE & MARK D. JANIS, TRADEMARKS & UNFAIR COMPETITION: LAW & POLICY 330–31 (2004).

29. For a discussion of trademark law's implications for the queer community, see generally Llewellyn Joseph Gibbons, *Semiotics of the Scandalous and the Immoral and the Disparaging: Section 2(a) Trademark Law After Lawrence v. Texas*, 9 MARQ. INTELL. PROP. L. REV. 187, 191 (2005).

30. I place the word "cure" in quotation because, to these groups, it is condescending. I use the term merely for rhetorical force to demonstrate the stigmatization such language can cause these groups.

these people would be normatively good, further marginalizing these groups.

One particular group whose trait is increasingly shown to be biologically related has already borne the brunt of societal and expressive marginalization: gays and lesbians. Recent scientific studies have demonstrated that homosexuality is undoubtedly influenced by biology, even if it is not biologically determined in all cases.<sup>31</sup> A likely result of such research into the origins of sexual orientation would be the formulation of methods to “cure” gays and lesbians.<sup>32</sup> An even more likely scenario would be a pre-natal screen that would estimate the likelihood that the fetus would be gay, permitting termination of the pregnancy<sup>33</sup> or perhaps consumption of a pill to reduce the likelihood of bearing a gay child.<sup>34</sup>

Patents resulting from the quest to find the “gay gene” or other biological origins of homosexuality have the potential to express moral condemnation of gays and lesbians. Although a patent relating to sexual orientation or the alteration of such orientation has yet to issue, at least one researcher in this field has confirmed his intent to pursue patent protection on such a discovery.<sup>35</sup>

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31. See, e.g., Brian S. Mustanski et al., *A Genomewide Scan of Male Sexual Orientation*, 116 *HUM. GENETICS* 272, 272–73 (2005).

32. As Dean Hamer notes humorously: “Another danger is that we will medicalize normal human behavior and variations . . . . What about that pesky gay gene? Spray it away with new ‘Straight-in-a-Day!’” *HAMER & COPELAND, LIVING*, *supra* note 15, at 304.

33. *Id.* at 85 (“Hanging over the entire field of genetics has been the specter of eugenics—that is, the deliberate breeding of people for certain selected heritable traits.”); ROSARIO, *infra* note 54, at 6 (“[T]he classification of homosexuality as abnormal or pathological does not exist in an essential way within its examination by scientists, but is constructed from a complex interaction of social values and individual researchers’ and subjects’ approaches, methods, and presuppositions.”); LEVAY, *QUEER SCIENCE*, *supra* note 24, at 171 (“On the one hand, this search [for a gay gene], if successful, seems to promise the most direct support for a liberating ‘born that way’ argument. On the other hand, it raises what is invariably described as the ‘specter of Nazi eugenics’—the possibility that attempts will be made to eliminate homosexuality through genetic ‘therapy,’ through the selective destruction of fetuses that carry ‘gay genes,’ or through sterilization of gay adults.”).

34. FUKUYAMA, *supra* note 16, at 39–40.

35. Dean Hamer has stated that he plans to use the rights to exclude others from using the discovery in a way harmful to others. *HAMER & COPELAND, SCIENCE OF DESIRE*, *supra* note 16, at 219 (“I could try to use the law to withhold the ‘testing’ technology, should it ever become available. Genetic testing as practiced in the United States requires commercialization, and commercialization generally requires protection of intellectual property through patents. If a lab does discover a ‘gay gene,’ it might be able to control the licensing of the technology.”); see also Garland E. Allen, *The Double-Edged Sword of Genetic Determinism: Social and Political Agendas in Genetic Studies of Homosexuality, 1940–1994*, in *SCIENCE AND HOMOSEXUALITIES* 242, 243 (Vernon A. Rosario ed., 1997) (“[Hamer] also vowed to patent his genetic testing techniques to insure that they could not be used in a discriminatory way.”).

This Article will explore the potential for patents to perform a social signaling function, apart from the market signal articulated in portfolio theory. I contend that patents communicate information that is relevant not only in a technical or pecuniary sense but also in a normative one. Central to this signaling is the utility doctrine, which delineates the inventions that are socially beneficial and thus worthy of patent protection. I explore these contentions using the paradigm of sexual orientation because it is pregnant with issues of morality and the potential for expressive consequences. Granting patents on genes related to sexual orientation, and potentially other conditions such as deafness, high-functioning autism, or dwarfism, communicates government approval that these groups are pathological and should be cured. Such a communication expressively harms these groups. This line of argument contributes an additional basis to criticize granting certain patents in areas relating to human biology and genetics.<sup>36</sup>

In Part II of this Article, I detail the biology of human sexual orientation, demonstrating that patents in this area are inevitable. Part III examines more rigorously the way in which a patent could signal condemnation of these various biologically-influenced groups. Part IV will then explore various prescriptions for dealing with this expressive harm.

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36. See generally MARGARET DAVIES & NGAIRE NAFFINE, ARE PERSONS PROPERTY? LEGAL DEBATES ABOUT PROPERTY AND PERSONALITY 155–58 (2002) (“Indigenous people and third-world activists around the world have reacted strongly against sampling and patenting specifically directed at their regional genetic characteristics, arguing that it is an act of ‘bio-piracy’ and a violation of cultural self-determination.”); Bagley, *supra* note 12; Joshua C. Benson, Note, *Resuscitating the Patent Utility Requirement, Again: A Return to Brenner v. Manson*, 36 U.C. DAVIS L. REV. 267, 270 (2002); Donna M. Gitter, *International Conflicts Over Patenting Human DNA Sequences in the United States and the European Union: An Argument for Compulsory Licensing and a Fair-Use Exemption*, 76 N.Y.U. L. REV. 1623, 1667 (2001); Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation?: The Anticommons in Biomedical Research*, 280 SCI. 698 (1998); Jonathan Kahn, *What’s the Use? Law and Authority in Patenting Human Genetic Material*, 14 STAN. L. & POL’Y R. 417, 423 (2003); Jordan Paradise, Lori Andrews & Timothy Holbrook, *Patents on Human Genes: An Analysis of Scope and Claims*, 307 SCI. 1566 (2005); Mark J. Hanson, *Religious Voices in Biotechnology: The Case of Gene Patenting*, 27 HASTINGS CENTER REPORT 1, 6 (1997).

These critiques differ from the one articulated in this Article. My argument is that, as a grant of property by the government, patents on inventions that relate to the identity of certain groups could inflict harm on those groups by suggesting they are less deserving or should be “cured.” The difference is subtle—previous criticisms, particularly based on identity, have condemned gene patents for affording property rights over what is quintessentially something that helps provide identity. My argument is that the government’s role, by granting patents, in fact suggests a preference for or against certain groups that are closely associated with that characteristic. My argument would apply not only to genes but also to other biological processes that help determine personality or non-pathological behaviors. In this Article, I do not argue that patenting of all genes, particularly those relating to diseases, is inappropriate.

## II. THE BIOLOGY OF HOMOSEXUALITY

Homosexuality is undeniably in the moral margins of society. Although attitudes have shifted over the years, with ever-increasing acceptance in today's society, a substantial portion of the U.S. population still views homosexuality as immoral, often due to religious beliefs.<sup>37</sup> Approval or disapproval of homosexuality is tightly linked to a person's age and to whether a person holds religious beliefs.<sup>38</sup> Such views are not terribly surprising because as recently as 1973 homosexuality was viewed as psychologically pathological and worthy of treatment.<sup>39</sup> The recent debates over the military's "don't ask, don't tell" policy, same-sex marriage, and gay adoption all highlight the reality that gays and lesbians are not on the same moral footing as heterosexuals in America today.

Gays and lesbians have obtained greater acceptance socially and legally, however. Homosexuality is no longer considered a disease, and psychological treatments to change sexual orientation have been condemned by the medical establishment as ineffective and potentially harmful.<sup>40</sup> Legally, states and localities are affording gays and lesbians far more legal protections than in the past.<sup>41</sup> Many Americans believe that homosexuals should receive protection against employment discrimination.<sup>42</sup> Many localities afford domestic partner benefits to same-sex couples, and some states have begun to offer civil unions that afford rights equivalent to those of married couples.<sup>43</sup> Massachusetts legalized

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37. See Julian W. Slowinski, *Therapeutic Dilemmas: Solving Sexual Difficulties in the Context of Religion*, 26 J. OF SEX ED. & THERAPY 272, 278 (2001). A May 2006 Gallup poll found that forty-four percent of Americans say homosexuality is morally acceptable and fifty-one percent say it is morally wrong. Lydia Saad, *Americans at Odds Over Gay Rights*, GALLUP POLL, May 31, 2006, <http://poll.gallup.com/content/default.aspx?ci=23140>.

38. Saad, *supra* note 37 ("However, across society such expressed tolerance ranges from 74% among liberal Americans to 18% among frequent churchgoers. A strong generational split is also evident, as only one-third (32%) of seniors say it is morally acceptable, compared with a majority (54%) of those under 40 years old.").

39. ROBERT ALAN BROOKEY, *REINVENTING THE MALE HOMOSEXUAL: THE RHETORIC AND POWER OF THE GAY GENE* (2002).

40. *Id.* at 37; Hubert Kennedy, *Karl Heinrich Ulrichs: First Theorist of Homosexuality*, in *SCIENCE AND HOMOSEXUALITIES* 26, 39 (Vernon A. Rosario ed., 1997); LEVAY, *QUEER SCIENCE*, *supra* note 24, at 211.

41. See, e.g., *In re Marriage Cases*, Nos. A110449, A110450, A110451, A110463, A110651, A110652, slip op. at 15–16 (Cal. Sup. Ct. Oct. 5, 2006) (noting domestic partnership laws and legal protections).

42. Saad, *supra* note 37 (finding eighty-nine percent of Americans believe that homosexuals should have equal job opportunities).

43. *Baker v. Vermont*, 170 Vt. 194, 197 (1999). Connecticut began recognizing civil unions on October 1, 2005. See William Yardley, *Connecticut Approves Civil Unions for Gays*, N.Y. TIMES, Apr. 21, 2005, at B5.

same-sex marriage itself.<sup>44</sup> Even the U.S. Supreme Court's view of gays and lesbians has shifted dramatically.<sup>45</sup> The expressive dimension to these decisions is explicitly noted in the opinions.<sup>46</sup>

Notwithstanding such progress, homosexuality in the United States remains a topic of considerable moral debate. Many religions condemn homosexual conduct as immoral and view homosexuals as “disordered.”<sup>47</sup> Members of Congress have proposed a constitutional amendment to prohibit state and local governments from affording marriage rights to same-sex couples.<sup>48</sup> A primary argument used by those opposed to gay rights is that homosexuality is a chosen lifestyle. In response to this argument, the gay rights movement has argued that homosexuality is not a choice.<sup>49</sup> To bolster this argument, advocates suggest that—be it nature or nurture—there is no volition in deciding that one is gay or lesbian.

Due in part to this debate, scientists have performed numerous investigations into the biological<sup>50</sup> causes of homosexuality. Sexual orientation, even biologically speaking, is a complex characteristic; finding a single cause is highly unlikely.<sup>51</sup> Sexual orientation is most

44. *Goodridge v. Dep't of Pub. Health*, 440 Mass. 309, 312 (2003).

45. In *Romer v. Evans*, 517 U.S. 620 (1996), the Court held unconstitutional on equal protection grounds an amendment to the Colorado constitution that prohibited any arm of the state from extending legal protection to gays and lesbians. *Id.* at 635. In *Lawrence v. Texas*, 539 U.S. 558 (2003), the Court held sodomy laws unconstitutional as a violation of due process, overruling *Bowers v. Hardwick*, 478 U.S. 186 (1986). In surprisingly strong language, the Court noted that “*Bowers* was not correct when it was decided, and it is not correct today.” *Lawrence*, 539 U.S. at 578.

46. *Lawrence*, 539 U.S. at 575 (“[*Bower*'s] continuance as precedent demeans the lives of homosexual persons.”); *Romer*, 517 U.S. at 635 (The Colorado amendment “classif[ie]d homosexuals not to further a proper legislative end but to make them unequal to everyone else.”).

47. See generally ALICE OGDEN BELLIS & TERRY L. HUFFORD, SCIENCE, SCRIPTURE, AND HOMOSEXUALITY 13 (2002). See, e.g., *Catechism of the Catholic Church*, ¶¶ 2357–59 (2005), [http://www.vatican.va/archive/ENG0015/\\_P85.HTM](http://www.vatican.va/archive/ENG0015/_P85.HTM).

48. See Jan Crawford Greenburg, *Gay Marriage Ban Rejected*, CHI. TRIB., Nov. 19, 2003, at 1; Evelyn Nieves, *Family Values Groups Gear Up For Battle Over Gay Marriage*, WASH. POST, Aug. 17, 2003, at A6.

49. See Devon W. Carbado, *Straight Out of the Closet*, 15 BERK. WOMEN'S L.J. 76, 109 n.205 (2000).

50. When I refer to “biological” causes of homosexuality, I include both genetic, heritable causes and congenital causes, such as hormone levels in the uterus or relative placement of a fetus in the uterus. Such factors would be distinct from post-birth interactions with the environment, such as parental influence. One possible exception could be if, for example, something in a mother's milk transferred hormones to the child, impacting the child's sexual orientation. At this time, no such evidence exists but, because the impact would result from a physical exposure—hormone levels—I would also consider this to be biological even though it occurs after birth.

51. HAMER & COPELAND, LIVING, *supra* note 15, at 198 (“We do not expect to find a gene that is the same in every gay man—we already know that sexual orientation is more complex than that—just one that is correlated to sexual orientation.”); Ronald Kotulak, *Homosexuality May Be Issue of Brain Chemistry*, CHI. TRIB., Nov. 13, 2003, at 22 (“I don't think homosexuality can easily be conceptualized as just one thing—a phenomenon that is due to one particular developmental

likely influenced by a number of biological factors.<sup>52</sup> Overall, a person likely possesses a biologically determined disposition toward a certain sexual orientation, which is resistant to alteration.<sup>53</sup>

This part reviews the studies exploring the biology of sexual orientation. These investigations confirm that sexual orientation is strongly influenced by biology, even if the particular mechanisms are presently unknown.<sup>54</sup> Four categories of studies have demonstrated this influence: twin studies, brain physiology studies, gene marker studies, and fraternal birth-order studies.<sup>55</sup>

#### *A. Twin Studies Demonstrate Genetic Influence on Sexual Orientation*

The classic method for assessing the genetic influence on a trait is to study identical twins separated at birth. Because these siblings have an identical genetic makeup but do not share the same environment, such studies can isolate the impact of environmental influences on the expression of a given trait.<sup>56</sup> For sexual orientation studies, however, such data are not readily available.<sup>57</sup> Instead, the studies have focused on the differences between identical twins, fraternal twins, and siblings.<sup>58</sup> If a trait is genetically linked, then identical twins will more likely share the trait, whereas fraternal twins will possess the trait at the same ratio as a non-twin sibling.<sup>59</sup> If the trait is influenced by intrauterine factors, then

pathway.” (quoting Heino F. L. Meyer-Bahlburg, a Columbia University professor of clinical psychology)).

52. Mustanski, *supra* note 31, at 273 (“Given the complexity of sexual orientation, numerous genes are likely to be involved . . .”); Pillard, *supra* note 23, at 230.

53. Pillard, *supra* note 23, at 233.

54. I use “environmental” to refer to non-biological influences. This is in contrast to a geneticist, who would view, for example, variations in intrauterine conditions as “environmental.” See Vernon A. Rosario, *Homosexual Bio-Histories: Genetic Nostalgias and the Quest for Paternity*, in *SCIENCE AND HOMOSEXUALITIES* 1, 4 (Vernon A. Rosario ed., 1997). Thus, I eschew the geneticist definition, focusing on potential biological sources of homosexuality. See *supra* note 50.

55. These studies exclusively deal with gay men and not with lesbians. Little is known about the origins of lesbianism. See, e.g., Edward M. Miller, *Homosexuality, Birth Order, and Evolution: Toward an Equilibrium Reproductive Economics of Homosexuality*, 29 *ARCHIVES OF SEXUAL BEHAV.* 1, 14 (2000); Domonick J. Wegesin, *A Neuropsychologic Profile of Homosexual and Heterosexual Men and Women*, 27 *ARCHIVES OF SEXUAL BEHAV.* 91, 92 (1998).

56. See BELLIS & HUFFORD, *supra* note 47, at 29; LEVAY, *QUEER SCIENCE*, *supra* note 24, at 177.

57. Gay identical twins that have been reared separately have been studied, but the numbers are too small to have any statistical significance. *Id.* at 178.

58. BELLIS & HUFFORD, *supra* note 47, at 25–30.

59. Pillard, *supra* note 23, at 234. Adoptive siblings will share the trait at same rate as the population as a whole. *Id.*

fraternal twins will share the trait more frequently than non-twin siblings.<sup>60</sup>

Numerous twin studies have been performed with respect to homosexuality.<sup>61</sup> The study performed by J. Michael Bailey and Richard Pillard found that in fifty-two percent of the cases, if one identical twin was gay, then the other also was.<sup>62</sup> The rate for fraternal twin brothers was twenty-two percent.<sup>63</sup> The concordance rate for adopted brothers was only eleven percent.<sup>64</sup> Thus, while not entirely determined by genetics,<sup>65</sup> homosexuality does have a strong genetic component. Numerous other twin studies have been performed that confirm a genetic influence.<sup>66</sup> Therefore, “[t]here is no room for doubt that homosexuality is highly heritable.”<sup>67</sup>

#### *B. Variations in the Hypothalamus Suggest There May Be a Biologically “Gay Brain”*

In addition to twin studies, researchers have explored whether there could be physical differences between gays and straights that might suggest a biological origin to sexual orientation. A natural place to look for such physiological differences would be the brain given that sexual attraction and arousal are strongly rooted there. Of particular importance is the hypothalamus, the part of the brain from which sexual desire

60. *Id.* at 234.

61. See LEVAY, QUEER SCIENCE, *supra* note 24, at 173–78; MATT RIDLEY, GENOME: THE AUTOBIOGRAPHY OF A SPECIES IN 23 CHAPTERS 117 (1999) (“A dozen other studies came to a similar conclusion [that a gene or genes contribute to homosexuality].”).

62. J. Michael Bailey & Richard Pillard, *A Genetic Study of Male Sexual Orientation*, 48 ARCHIVES OF GEN. PSYCHIATRY 1092 (1991).

63. *Id.*

64. Allen, *supra* note 35, at 252.

65. An exclusively genetic trait would have a concordance rate of one hundred percent. BELLIS & HUFFORD, *supra* note 47, at 26. A concordance rate of less than one hundred percent does not mean there is no genetic component to homosexuality or that homosexuality arises strictly due to environmental forces. See William J. Turner, *Homosexuality, Type 1: An Xq28 Phenomenon*, 24 ARCHIVES OF SEXUAL BEHAV. 109, 125–26 (1995). For other anatomical and biochemical conditions, concordance rates can be less than one hundred percent due to other biological mechanisms coming into play. HAMER & COPELAND, LIVING, *supra* note 15, at 188; Turner, *supra*, at 125–26. The gay gene may simply be inactive in the unaffected sibling. Turner, *supra*, at 126.

66. See BELLIS & HUFFORD, *supra* note 47, at 27–28; LEVAY, QUEER SCIENCE, *supra* note 24, at 175–77; Mustanski, *supra* note 31, at 273 (all summarizing various twin studies).

67. RIDLEY, *supra* note 61, at 116–17; see also LEVAY, QUEER SCIENCE, *supra* note 24, at 177. Indeed, studies suggest that shared parental environment has almost no impact on sexual orientation. HAMER & COPELAND, LIVING, *supra* note 15, at 188 (“In the most careful twin study to date, the best mathematical estimate for the shared environmental component of variance was 0 percent.”).

originates.<sup>68</sup> Researcher Simon LeVay discovered that the size of the hypothalamus differs between homosexual and heterosexual men.<sup>69</sup> Prior research showed that the hypothalami of men and women differ in size in a statistically significant way.<sup>70</sup> In LeVay's study, he found that, on average, gay men's hypothalamus were two to three times smaller than heterosexual men's and were the same size as women's.<sup>71</sup> Such a finding suggests that the neuronal mechanisms in the brain that regulate sexual behavior may differ physically between gay and straight men.<sup>72</sup> Finding physical differences in the brains of gay men is consistent with studies on cognitive differences between gays and straights, which suggest differing brain structures,<sup>73</sup> and with studies done on animals demonstrating same-sex attraction, which show a similar dimorphism in the hypothalamus.<sup>74</sup> Subsequent studies also have shown variations in the brain structures of gays and straights.<sup>75</sup> These differences in brain structure could be the result of genetic or hormonal influence on the development of the brain.

There is a "chicken-and-egg" problem to these studies, however. The brain is a dynamic organ that changes over time. As such, environmental factors—such as engaging in different sexual behaviors—could change the shape of the hypothalamus or program it to react to certain stimuli.<sup>76</sup> As

68. See STEVEN PINKER, *THE BLANK SLATE: THE MODERN DENIAL OF HUMAN NATURE* 89 (2002).

69. SIMON LEVAY, *THE SEXUAL BRAIN* 120 (1993) [hereinafter LEVAY, *SEXUAL BRAIN*].

70. LEVAY, *SEXUAL BRAIN*, *supra* note 69, at 120. The hypothalamus is "a tiny region at the base of the brain." LEVAY, *QUEER SCIENCE*, *supra* note 24, at 130. LeVay specifically studied the INAH 3 region, which is sexually dimorphic. LEVAY, *SEXUAL BRAIN*, *supra* note 69, at 120. For convenience, I will refer generally to the hypothalamus.

71. LEVAY, *QUEER SCIENCE*, *supra* note 24, at 143; LEVAY, *SEXUAL BRAIN*, *supra* note 69, at 120–21.

72. LEVAY, *SEXUAL BRAIN*, *supra* note 69, at 121. LeVay considered alternative possible causes for the size difference, such as whether AIDS had changed the size of the hypothalamuses of the gay men. He concludes that AIDS was not the cause of the difference, but recognizes that using AIDS victims risks a sampling bias. *Id.*

73. Wegesin, *supra* note 55, at 94.

74. LEVAY, *QUEER SCIENCE*, *supra* note 24, at 199. Homosexual acts have been observed in a variety of animals. *Id.* at 197; see also Larry Thompson, *Search for a Gay Gene*, *TIME*, June 12, 1995, at 60–61 (homosexuality in fruit flies). Homosexual conduct is "widely distributed in the animal kingdom." PAUL R. EHRLICH, *HUMAN NATURES* 195 (2000). Hypothalamus differences have been found in rams as well. Ronald Kotulak, *Homosexuality May Be Issue of Brain Chemistry*, *CHI. TRIB.*, Nov. 13, 2003, at 22.

75. Miller, *supra* note 55, at 13. In a study of the reaction of men to male-derived chemicals, the homosexual men in the study responded in the same manner as straight women, with activation of the hypothalamus, whereas heterosexual men showed no response. See Ivanka Savic et al., *Brain Response to Putative Pheromones in Homosexual Men*, *PROC. OF THE NAT'L ACAD. OF SCI.* 7356, 7356 (2005).

76. See, e.g., BELLIS & HUFFORD, *supra* note 47, at 36; LEVAY, *QUEER SCIENCE*, *supra* note 24, at 144 ("[T]here is always at least the theoretical possibility that the structural differences are actually the result of differences in sexual behavior.").

such, these results beg the question of whether the brain differences influenced sexual orientation or whether sexual orientation influenced the changes in the brain.<sup>77</sup> Regardless, there is considerable scientific evidence that the physical structure of the brain plays a significant role in sexual orientation.

*C. Discovery of a “Gay Gene” Marker Suggests a Genetic Link to Homosexuality*

One possible reason for the physical differences between gay and straight brains is that a gene or genes could influence the development of the brain. If there is such a genetic link, then homosexuality should run in families.<sup>78</sup> In fact, it does—both gay men and lesbians have a greater likelihood of having gay or lesbian siblings.<sup>79</sup> Researcher Dean Hamer recognized this reality, resulting in perhaps the most startling—and controversial—scientific study into the biological cause of homosexuality: he identified a link between a known genetic marker on the X chromosome and homosexuality, suggesting a gene influencing sexual orientation may be at that location.

Hamer had noted that the maternal branches of his subjects contained a disproportionate number of homosexual family members.<sup>80</sup> If a characteristic seems to be passed to a son by the mother and not the father, then it likely is controlled by a gene on the X chromosome.<sup>81</sup> Recognizing the likelihood that homosexuality could be a sex-linked trait, Hamer performed a linkage study on his subjects<sup>82</sup> and found a statistically

77. See LEVAY, *SEXUAL BRAIN*, *supra* note 69, at 122; Rosario, *supra* note 54, at 5 (“[A] larger INAH 3 might be either one of the causes of male heterosexuality, or the by-product of a heterosexual lifestyle choice.”); Savic et al., *supra* note 75, at 7361 (noting causation of hormone response could be hypothalamus differentiation, acquired sensitization through stimuli, or association with scent to sex).

78. Pillard, *supra* note 23, at 233.

79. *Id.*; Sven Bocklandt et al., *Extreme Skewing of X Chromosome Inactivation in Mothers of Homosexual Men*, 118 *HUM. GENETICS* 691, 691 (2006); Mustanski, *supra* note 31, at 273.

80. HAMER & COPELAND, *LIVING*, *supra* note 15, at 190; HAMER & COPELAND, *DESIRE*, *supra* note 16, at 93–94.

81. HAMER & COPELAND, *DESIRE*, *supra* note 15, at 95.

82. HAMER & COPELAND, *DESIRE*, *supra* note 16, at 120–33. A linkage study does not identify a gene for a given trait but instead shows a statistical relationship between a stretch of DNA and a trait. Pillard, *supra* note 23, at 235. Specifically, such studies examine the statistical probability that there is a gene associated with a phenotypic trait on a chromosome at a known location, the marker. The linkage is demonstrated through the use of markers, which are genes or gene fragments that are known on a given chromosome. These markers act as road signs because, on a single chromosome, genes close together generally stay together during meiotic cell division. So, if there is a gay gene on the X chromosome, it will almost always be beside a given marker. The linkage study examined whether the gay members of a family share a marker that the straight members did not. If such a correlation exists,

significant link between a known marker, Xq28, and the trait of male homosexuality.<sup>83</sup> The study concluded that the “linkage results [were] statistically significant at a confidence level of >99 percent.”<sup>84</sup>

Although some have disputed this linkage,<sup>85</sup> Hamer subsequently confirmed his results.<sup>86</sup> Other studies have also suggested a genetic influence arising from the X chromosome.<sup>87</sup> More recent investigations have expanded the search for genes influencing orientation beyond the X chromosome and have identified three new regions where potential “gay genes” may be located.<sup>88</sup> Thus, researchers are likely to find genes that influence sexual orientation, discoveries that would be eligible for patent protection. Minimally, the quest continues in earnest.

#### *D. Male Birth Order Phenomenon Suggests a Congenital Origin*

Genes may not be the only biological trigger for homosexuality. Recent studies have also demonstrated a potential congenital cause for male homosexuality. The more sons that a woman has, the greater the likelihood that a subsequent son will be gay.<sup>89</sup> So, younger brothers are more likely

then the trait—homosexuality—may have a genetic component located near that marker. *See generally* HAMER & COPELAND, *DESIRE*, *supra* note 16, at 113.

83. HAMER & COPELAND, *DESIRE*, *supra* note 16, at 121–33. By chance, brothers would normally have a 50% chance of sharing the markers; Hamer found that 83% of the gay brothers had matching variants, while the control of random pairs of brothers satisfied the expected 50% rate. Allen, *supra* note 35, at 253.

84. Dean H. Hamer et al., *A Linkage Between DNA Markers on the X Chromosome and Male Sexual Orientation*, 261 *SCIENCE* 321, 325 (1993), *reprinted in* HAMER & COPELAND, *DESIRE*, *supra* note 16, at App. A. Importantly, the study did not find a gay gene. It merely found an association between homosexuality and a location on the X chromosome.

85. A group of researchers at the University of Western Ontario failed to find any markers linked to homosexuality. LEVAY, *QUEER SCIENCE*, *supra* note 24, at 184–85. Importantly, these results were not published in a peer-reviewed journal. Mustanski, *supra* note 31, at 273. Moreover, the methodology of that study renders its findings ambiguous as to the impact of Xq28 on homosexuality because the study looked at paternal relatives, not maternal. HAMER & COPELAND, *LIVING*, *supra* note 15, at 197.

86. BELLIS & HUFFORD, *supra* note 47, at 25; LEVAY, *QUEER SCIENCE*, *supra* note 24, at 183–84; Mustanski, *supra* note 31, at 273.

87. Turner, *supra* note 65, at 121, 125. A recent study found that mothers of gay men tend to have more offspring. This study provides further support for a genetic predisposition for homosexuality and also offers a theory to resolve the Darwinian paradox—that a gene for homosexuality should die out because it does not encourage propagation of the gene. Andrea Camperio-Ciani et al., *Evidence for Maternally Inherited Factors Favouring Male Homosexuality and Promoting Female Fecundity*, *PROC. OF THE ROYAL SOC’Y B: BIOLOGICAL SCI.* 2217, 2219, (2004); *see also* Andy Coughlin, *Survival of Genetic Homosexual Traits Explained* (Oct. 13, 2004), <http://www.newscientist.com/article.ns?id=dn6519> (“The same factor that influences sexual orientation in males promotes higher fecundity in females.”) (quoting Andrea Camperio-Ciani).

88. Mustanski, *supra* note 31, at 276.

89. *See* RIDLEY, *supra* note 61, at 118 (“A man with one or more elder brothers is more likely to

to be gay than their older brothers. Interestingly, the presence of sisters is irrelevant, resulting in a fraternal birth order effect.<sup>90</sup> While anecdotally, many gay men have noted that they and many of their friends are the youngest in the family, the studies show that there is more to this phenomenon than simple coincidence. Each additional older brother increases the likelihood of homosexuality by about one-third,<sup>91</sup> and the phenomenon has been documented not only in the United States but also in Britain, the Netherlands, and Canada.<sup>92</sup> Moreover, a recent study has shown that the birth effect is not due to any social factors related to exposure to older siblings. The only significant factor was the number of older biological male siblings, regardless of whether the gay individual was raised with those brothers.<sup>93</sup>

Scientists have yet to discover the exact process that creates the birth-order effect, although they have posited various theories. Hormone levels, or the fetuses' susceptibility to hormones, could influence sexual orientation.<sup>94</sup> A woman could build up a "resistance" to the male fetus, creating more female hormones.<sup>95</sup> These hormones may interfere with the determination of the cells and brain structures that otherwise result in a heterosexual child.<sup>96</sup> If the hormones act to prevent masculinization of the developing fetus—or allow feminization—the result could be changes in the sexual differentiation of the brain.<sup>97</sup> Finally, there could be a genetic

be gay than a man with no siblings, only younger siblings, or with one or more elder sisters."); Ray Blanchard & Anthony F. Bogaert, *Birth Order in Homosexual Versus Heterosexual Sex Offenders Against Children, Pubescents, and Adults*, 27 ARCHIVES OF SEXUAL BEHAV. 595, 595–96 (1998); David W. Purcell et al., *Birth Order in a Contemporary Sample of Gay Men*, 29 ARCHIVES OF SEXUAL BEHAV. 349, 352–53 (2000).

90. RIDLEY, *supra* note 61, at 118; Purcell, *supra* note 89, at 350.

91. RIDLEY, *supra* note 61, at 118.

92. *Id.*

93. Anthony F. Bogaert, *Biological Versus Nonbiological Older Brothers and Men's Sexual Orientation*, 103 PROC. OF THE NAT'L ACAD. OF SCI. 10771, 10771 (2006). The study found that "[o]nly biological older brothers [reared with or not] and not any other sibling characteristic, including nonbiological older brothers, [and the time reared with older biological or older nonbiological brothers] predicted men's sexual orientation." *Id.* at 10771.

94. FUKUYAMA, *supra* note 16, at 37.

95. Blanchard and Bogaert, *supra* note 89, at 602 (suggesting the fraternal birth order phenomenon "reflects the progressive immunization of some mothers to Y-linked minor histocompatibility antigens (H-Y antigen) by each succeeding male fetus, and the concomitantly increasing effects of H-Y antibodies on the sexual differentiation of the brain in each succeeding male fetus."); Bogaert, *supra* note 93, at 10772–73; Purcell et al., *supra* note 89, at 354.

96. Blanchard & Bogaert, *supra* note 89, at 602. Ridley notes that the H-Y gene is similar to a gene that encodes the anti-Mullerian hormone, responsible for causing the regression of the Mullerian ducts in a male embryo. RIDLEY, *supra* note 61, at 119. These ducts are the precursors to the uterus and Fallopian tubes and, thus, their regression is essential for the development of a male embryo. RIDLEY, *supra* note 61, at 119.

97. RIDLEY, *supra* note 61, at 119 ("If so, the effect of a strong immune reaction against these

component because genes could influence how the fetus interacts with the intrauterine hormones.<sup>98</sup>

All of these biological investigations demonstrate that sexual orientation is influenced by biological mechanisms. While homosexuality may not be entirely determined by biology, any aspect of biology that is relevant could serve as a means to moderate the process. These techniques, or even simple correlations of hormone levels or the presence of certain genes with an increased likelihood of a homosexual orientation would be eligible for patent protection. Patents on these discoveries therefore are highly likely, if not inevitable, particularly in this era where there is an apparent rush to patent everything.

### III. THE POTENTIAL FOR EXPRESSIVE HARMS FROM PATENTS

The patent system will confront these types of biological discoveries. Patent applicants can claim their invention in a variety of ways under the patent laws. Patents are available for methods, machines, manufactures, and compositions of matter.<sup>99</sup> Applicants therefore could claim discoveries and innovations relating to sexual orientation, and other biologically defined traits, in one of these forms. For example, if an actual gene that influences sexual orientation is discovered, the scientist could obtain a patent that claims the purified and isolated gene as a composition of matter. If variations of in utero hormone levels are found to influence orientation, then the applicant could patent a method of measuring those hormone levels and correlating those levels with the likelihood of the fetus being gay. The ultimate claim would be a method of altering these various biological pathways in the hope of altering the subject's sexual orientation, particularly if acting in utero. The patent system is thus directly implicated

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proteins from the mother would be partly to prevent the masculinisation of the brain, but not that of the genitals.”); LEVAY, *SEXUAL BRAIN*, *supra* note 69, at 123; Blanchard & Bogaert, *supra* note 89, at 602.

98. LEVAY, *QUEER SCIENCE*, *supra* note 24, at 125; Miller, *supra* note 55, at 6 (“Such genes might change the level of hormones during prenatal critical periods, or the receptor density, or the level of enzymes that convert one steroid to another, or the level of binding proteins, or the permeability of the blood-brain barrier to hormones . . . . Just enumerating some of the possible pathways makes it plausible that multiple genes could be involved.”). Miller suggests that the birth order effect would have reproductive advantages because later-born, more feminized sons would “reduce[] the probability of these sons engaging in unproductive competition with each other.” Miller, *supra* note 55, at 30. The recent study on the fecundity of mothers also supports these various hypotheses. In order for the birth order phenomenon to take place, a given female must have a fair number of off-spring. The link between male homosexuality and increased female fecundity further supports the “immunization view.” Camperio-Ciani et al., *supra* note 87, at 2219.

99. 35 U.S.C. § 101 (2000).

in these technologies and is fostering an incentive to create eugenic technologies that will be in the hands of private parties.

#### A. *What Are Expressive Harms?*

Expressive theories of law are concerned with the way in which government action can communicate a specific belief or attitude of the state, such as hostility to racial or ethnic groups or religion.<sup>100</sup> Under this view, laws can shape or reinforce social norms and also inflict harms upon members of society.<sup>101</sup> Indeed, it is beyond cavil that “the linguistic meaning of governmental action can have a *moral impact*.”<sup>102</sup> Laws can be examined normatively by assessing how they express certain intentions and attitudes.<sup>103</sup> Racial segregation, for example, communicates that blacks are inferior to whites and that whites must be protected from blacks.<sup>104</sup> The expressive harm occurs regardless of whether the targets—here blacks—believe or accept the message; so long as they understand the message communicated, the harm arises.<sup>105</sup> What is important is the “social, or symbolic, meaning” of certain laws or other acts by the state.<sup>106</sup>

Specifically, “[e]xpressive theories do not somehow tell us to maximize the amount of proper expression in the world. Instead, expressive theories are regulative theories that provide principled constraints on how we go about pursuing various ends.”<sup>107</sup> The subjective

100. See Elizabeth S. Anderson & Richard H. Pildes, *Expressive Theories of Law: A General Restatement*, 148 U. PA. L. REV. 1503, 1506 (2000) [hereinafter Anderson & Pildes, *Expressive I*].

101. Mark D. Rosen, *Establishment, Expressivism, and Federalism*, 78 CHI.-KENT L. REV. 669, 670 (2003).

102. Matthew D. Adler, *Expressive Theories of Law: A Skeptical Overview*, 148 U. PA. L. REV. 1363, 1494 (2000). Within the academic literature, there has been a debate over what constitutes “expressivism” and whether such a theory can justify certain laws. Compare *id.* at 1364 with Anderson & Pildes, *Expressive I*, *supra* note 100. Both of these camps, however, recognize that government acts can have expressive impacts. See Matthew D. Adler, *Linguistic Meaning, Nonlinguistic “Expression,” and the Multiple Variants of Expressivism: A Reply to Professors Anderson and Pildes*, 148 U. PA. L. REV. 1577, 1577 (2000). I am not suggesting that patent law is justified by expressive theory. Instead, I am exploring the proposition that both sides agree could occur: the grant of a patent—a form of government communication—can express disfavor or hostility towards certain members of society.

103. Anderson & Pildes, *Expressive I*, *supra* note 100, at 1508; Rosen, *supra* note 101, at 669–70.

104. See, e.g., *Johnson v. California*, 543 U.S. 499, 505–06 (2005) (“Racial classifications raise special fears that they are motivated by an invidious purpose. Thus, we have admonished time and again that, “[a]bsent searching judicial inquiry into the justification for such race-based measures, there is simply no way of determining . . . what classifications are in fact motivated by illegitimate notions of racial inferiority or simple racial politics.” (quoting *Richmond v. J.A. Croson Co.*, 488 U.S. 469, 493 (1989) (plurality opinion))); see also Anderson & Pildes, *Expressive I*, *supra* note 100, at 1528.

105. Anderson & Pildes, *Expressive I*, *supra* note 100, at 1528.

106. Alex Geisinger, *A Belief Change Theory of Expressive Law*, 88 IOWA L. REV. 35, 40–41 (2002).

107. Anderson & Pildes, *Expressive I*, *supra* note 100, at 1512.

intent of a speaker is not necessarily sufficient to explain the message communicated, however. Whether an expressive harm arises under these theories is objectively assessed from the viewpoint of the public.<sup>108</sup> Thus, somewhat surprisingly, the intentions of an actor are not the only factors relevant in assessing the expressive impact of those acts.<sup>109</sup> The expressive harm can arise when people understand the message communicated, even if they may not agree with the message.<sup>110</sup> Any interpretation of the impact of course will depend on the context of the communication.<sup>111</sup> A person will suffer an expressive harm when “she is treated according to principles that *communicate* negative or inappropriate attitudes toward her.”<sup>112</sup> Under expressive theories, “state action should be wrong . . . when it expresses impermissible valuations, without regard to further concerns about its cultural or material consequences.”<sup>113</sup>

The acts of the state can thus send a signal about what the norms of a society ought to be.<sup>114</sup> Laws can impact the views of individuals about which behaviors are approved or disapproved by society as a whole,<sup>115</sup> resulting in an actor understanding how others will view her behavior.<sup>116</sup> The state can act as a collective to express certain views, even if those views differ from those of individual legislators.<sup>117</sup> The legislative process also can affect attitudes expressively by revealing new information to society regarding a given subject.<sup>118</sup> Indeed, there may not even have to be a law passed—simple disclosure by the government may have expressive impacts.<sup>119</sup>

Expressive theory is present in a number of legal areas. Equal protection jurisprudence is rife with concerns of government stigmatization or marginalization of people based on characteristics such as race, ethnicity, and gender.<sup>120</sup> The courts have found laws

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108. *Id.* at 1512.

109. *Id.* at 1513.

110. *Id.* at 1545.

111. *Id.* at 1525.

112. *Id.* at 1528.

113. *Id.* at 1531.

114. See Geisinger, *supra* note 106, at 43; Cass R. Sunstein, *On the Expressive Function of Law*, 144 U. PA. L. REV. 2021, 2029–44 (1996).

115. See Geisinger, *supra* note 106, at 45.

116. *Id.* at 47.

117. *Id.*

118. *Id.* at 64–65.

119. *Id.* at 67. Geisinger uses the example of the Surgeon General announcing the harm from second-hand smoke. *Id.* While not a statute, it is a communication of information from an arm of the state. Thus, the government can send signals even absent the passage of an actual statute.

120. Anderson & Pildes, *Expressive I*, *supra* note 100, at 1533.

unconstitutional under the Equal Protection Clause even absent any actual, non-psychic harm: the expression of these views alone is sufficient.<sup>121</sup> Similar outcomes are found in the Establishment Clause cases, where the courts have found state acts as unconstitutionally endorsing religion; such endorsement is viewed as impermissible due to the fear of excluding members of society who do not adhere to the particular religious views expressed or embraced.<sup>122</sup> Criminal punishment, particularly incarceration, has received support from expressive theories, which suggest that a fine or community service in lieu of prison terms does not sufficiently communicate the moral condemnation to society that a loss of liberty through imprisonment can.<sup>123</sup>

Gays and lesbians have long endured laws which inflict expressive harms against them.<sup>124</sup> Sodomy laws were used to classify homosexuals as “criminals,” even if the laws were never enforced.<sup>125</sup> Until overturned by the Supreme Court, Colorado’s amendment to the state constitution that prohibited cities and municipalities from providing civil rights protection for gays and lesbians communicated a strong message of inferiority.<sup>126</sup>

121. *Id.* at 1534–35; see *Johnson*, 543 U.S. at 519 (Stevens, J., dissenting) (“Such musings inspire little confidence. Indeed, this comment supports the suspicion that the policy is based on racial stereotypes and outmoded fears about the dangers of racial integration. This Court should give no credence to such cynical, reflexive conclusions about race.”); *Shaw v. Reno*, 509 U.S. 630, 643 (1993) (“Classifications of citizens solely on the basis of race ‘are by their very nature odious to a free people whose institutions are founded upon the doctrine of equality.’ They threaten to stigmatize individuals by reason of their membership in a racial group and to incite racial hostility.” (citations omitted) (quoting *Hirabayashi v. U.S.*, 320 U.S. 81, 100 (1973))).

122. Anderson & Pildes, *Expressive I*, *supra* note 100, at 1547. Whether those “nonadherents” actually feel excluded is irrelevant. *Id.* What is key is the government’s communication of endorsement which necessarily excludes those nonadherents. *Lynch v. Donnelly*, 465 U.S. 668, 688 (1984) (O’Connor, J., concurring) (“Endorsement sends a message to nonadherents that they are outsiders, not full members of the political community, and an accompanying message to adherents that they are insiders, favored members of the political community. Disapproval sends the opposite message.”). Justice O’Connor’s views have begun to take hold in the Court’s establishment jurisprudence. See, e.g., *County of Allegheny v. ACLU, Greater Pittsburgh Chapter*, 492 U.S. 573, 593–94 (1989) (citing O’Connor’s concurrence in *Lynch* favorably).

123. Dan M. Kahan, *What Do Alternative Sanctions Mean?* 63 U. CHI. L. REV. 591, 605–30 (1996). *But see* Adler, *supra* note 102, at 1366–68 (discussing and criticizing this theory).

124. See generally ANDREW KOPPELMAN, *ANTIDISCRIMINATION LAW AND SOCIAL EQUALITY* 146–76 (1996).

125. *Lawrence v. Texas*, 539 U.S. 558, 578 (2003) (“The State cannot demean their existence or control their destiny by making their private sexual conduct a crime.”); see also Christopher R. Leslie, *Creating Criminals: The Injuries Inflicted by “Unenforced” Sodomy Laws*, 35 HARV. C.R.-C.L. L. REV. 103, 104 (2000). Leslie correctly points out that sodomy laws harmed gays and lesbians beyond expressive harms, such as providing a basis to deny child custody to gay and lesbian parents and denial of certain employment opportunities. *Id.*

126. See *Romer v. Evans*, 517 U.S. 620, 635 (1996) (“We must conclude that Amendment 2 classifies homosexuals not to further a proper legislative end but to make them unequal to everyone else. This Colorado cannot do. A State cannot so deem a class of persons a stranger to its laws.”).

The denial of the right to marry also inflicts expressive harms—by being denied rights equal with those of heterosexuals, homosexuals are relegated to second-class citizenship.<sup>127</sup>

Recent patent scholarship has shown that patents communicate information beyond technical information regarding the invention.<sup>128</sup> This part similarly explores the ability of patents to communicate messages and signals, but of a non-pecuniary nature. The grant of a patent could communicate government disdain towards various biologically defined groups and behaviors by stating that “curing” these people is normatively good. Indeed, the patent system can be seen as facilitating privatized eugenics, a status of moral ambiguity. Now is the time to consider the possible implications of these inevitable discoveries.<sup>129</sup>

### *B. Factors that Influence the Expressive Aspect of Patenting*

No one has explored what expressive impact, if any, a patent could have. Currently, the patent system is viewed as morally agnostic, making no judgments about the value of individual patents. This perspective may need reconsideration in light of the biotechnology revolution. As researchers discover genes that relate to behaviors, and not diseases, our traditional understanding of the patent system will be tested. The relevant biological processes will continue to be a focus of scientific investigation,<sup>130</sup> and discoveries in this area certainly will be the subject of

127. See Opinions of the Justices to the Senate, 440 Mass. 1201, 1207 (2004) (“The dissimilitude between the terms ‘civil marriage’ and ‘civil union’ is not innocuous; it is a considered choice of language that reflects a demonstrable assigning of same-sex, largely homosexual, couples to second-class status.”); *Goodridge v. Dep’t of Pub. Health*, 440 Mass. 309, 312 (2003) (“The question before us is whether . . . the Commonwealth may deny the protections, benefits, and obligations conferred by civil marriage to two individuals of the same sex who wish to marry. We conclude that it may not. The Massachusetts Constitution affirms the dignity and equality of all individuals. It forbids the creation of second-class citizens.”); see also Bonnie Miller Rubin, *Same-sex Couples See Some Light*, CHI. TRIB., Nov. 19, 2003, at 30 (“Every day, you face reminders that you’re a second-class citizen.”). Cf. Anderson & Pildes, *Expressive I*, *supra* note 100, at 1533–45 (discussing expressivism in the context of equal protection jurisprudence, noting that the creation of “second-class citizenship” is one of the “most conventional expressive concerns”).

128. See Heald, *supra* note 8, at 476; Long, *supra* note 7, at 636–37; Parchomovsky & Wagner, *supra* note 7, at 7–9.

129. FUKUYAMA, *supra* note 16, at 19 (“Technological prediction is notoriously difficult and risky, particularly when talking about events that may still lie a generation or two away. Nonetheless, it is important to lay out some scenarios for possible futures that suggest a range of outcomes, some of which are very likely and even emerging today, and others which may never in the end materialize.”).

130. HAMER & COPELAND, *LIVING*, *supra* note 15, at 301 (“The combination of these two forces—the stampede to map the genome plus the decisive role of genes in behavior—means that, whether anyone thinks it’s a good idea or not, we soon will have the ability to change and manipulate human behavior through genetics.”).

future patent applications. For groups such as gays, the deaf,<sup>131</sup> dwarfs,<sup>132</sup> and high-functioning autistics, the granting of a patent risks communicating that they are inferior, flawed members of society that should be cured<sup>133</sup> or, potentially through prenatal testing or gene therapy, eliminated altogether.<sup>134</sup> I will use homosexuality as the paradigm to explore this expressive potential. The use of patents in the context of sexual orientation research is nearly a foregone conclusion. Dean Hamer has already stated that, if he isolates a gay gene, he intends to obtain intellectual property rights on it.<sup>135</sup>

Investigation of factors relative to expressive harms has never been discussed. For legislation, the communication of the message was presumed: it was simply not relevant whether the general populace was aware of a law being on the books. Statutes are public in nature and thus tend to “‘stand out’ against the background of public discourse.”<sup>136</sup> The nature of law as a governmental act necessarily communicates something

131. Comparisons between the experience of gays and the deaf have been made previously. *See* Rosario, *supra* note 54, at 11 (“Analogous to the case of deaf children struggling to consolidate an identity in a hearing family, most gays and lesbians lack familial role models for developing a ‘homosexual identity’ if they grow up in a heterosexual household.”). Richard Pillard poignantly explains the comparison:

I suppose most parents would not choose to have a gay child if they could choose otherwise. Fortunately, that choice is not at hand, but similar choices are. Deafness will soon be an example. Deafness is frequently genetic; approximately thirty different genetic loci for deafness have been hypothesized. Many people see deafness simply as a “handicap” and could not imagine the slightest objection to reducing or eliminating it. But those born deaf have a linguistic and cultural community, as precious to them as the gay community is to gays. The deaf, not surprisingly, want control of their culture and resent the imperialistic assumptions of the hearing majority.

Pillard, *supra* note 23, at 238.

132. *See* FUKUYAMA, *supra* note 16, at 209 (“Something similar [to homosexuality] can be said of dwarfism: human heights are distributed normally, and it is not clear at what point in the distribution one becomes a dwarf.”).

133. *See id.* at 39 (“Scientific knowledge about causation will inevitably lead to a technological search for ways to manipulate that causality.”).

134. LEVAY, *QUEER SCIENCE*, *supra* note 24, at 9 (“[W]ill we develop the technology to engineer homosexuality out of the human race, for example, and if so, should we be taking steps to prevent this from happening?”).

135. Hamer states that he plans to use the rights to exclude others from using the discovery in a way harmful to others. HAMER & COPELAND, *DESIRE*, *supra* note 16, at 219 (“Third, I could try to use the law to withhold the ‘testing’ technology, should it ever become available. Genetic testing as practiced in the United States requires commercialization, and commercialization generally requires protection of intellectual property through patents. If a lab does discover a ‘gay gene,’ it might be able to control the licensing of the technology.”); *see also* Allen, *supra* note 35, at 243. Of course a patent right is only temporary—at the end of the term, anyone is free to use the invention. So, Hamer’s laudable objective could only be temporarily realized.

136. Richard H. McAdams, *A Focal Point Theory of Expressive Law*, 86 VA. L. REV. 1649, 1668 (2000).

to the public. The content of every law, of course, is not expressed to the public, but laws can permeate the public sphere in a variety of ways—advertisement by the state, particular controversies surrounding a new law that are reported in the media,<sup>137</sup> and the potential for sanctions against third parties.<sup>138</sup> Laws or governmental communications, particularly those that impact people directly, are more likely to have an expressive impact. Such an assumption may not be valid in the patent context, however.

This part will identify a variety of factors that influence the expressive potential of patents. The first two of these factors are relevant to the threshold issue of whether patents can send expressive signals at all. The remaining factors concern the strength of such a signal and address the issue of whether any such signal may be lost in other “noise.”

*1. The Grant of a Patent as a Governmental Act: Are Patents Akin to Statutes?*

Generally, expressive theory has focused on statutes passed by governments, such as sodomy laws or laws that discriminate on the basis of race, gender, or other categories.<sup>139</sup> Commentators have also noted that expressive communications can occur through regulatory agencies and even judges.<sup>140</sup> Others have suggested that mere government communications that fall short of a statute can serve a signaling function.<sup>141</sup> What is key is a government communication—via statute or other information—that transmits the expressive message to the public. The question thus arises: is the grant of a patent akin to a statute or other form of government communication?

Patents serve purposes beyond simply affording the inventors exclusive rights to their inventions. They also serve to notify the public as to the scope of those rights, as well as providing disclosure to the public so that the know-how underlying the invention will enter the public domain. Patents can also serve as economic signals to other entities about the innovative ability and strength of a company<sup>142</sup> and to reduce transaction costs between parties.<sup>143</sup> These roles for patents demonstrate that patents

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137. Patents in the biotech world have garnered media attention already. *See infra* note 157 and accompanying text.

138. McAdams, *supra* note 136, at 1668–69.

139. *See, e.g.*, Anderson & Pildes, *Expressive I*, *supra* note 100, at 1533–64.

140. McAdams, *supra* note 136, at 1678–89.

141. *See supra* note 119 and accompanying text.

142. *See generally* Long, *supra* note 7; Parchomovsky & Wagner, *supra* note 7.

143. *See generally* Heald, *supra* note 8.

have a broader role in the public than the basic disclosure obligations suggest. The main reason patents can serve such varied functions is because they are grants of exclusive rights from the federal government. The patent has gone through a review by the government that vests the patent with some level of certainty regarding the credibility of the disclosure. The government also ensures that the patent will have some bite—it is a right enforceable against the world at large. While not technically legislation, the patent grant can be viewed as akin to private legislation.<sup>144</sup>

Courts have compared patents to statutes previously, recognizing that they share common features: “There can be only one correct interpretation of a statute that applies to all persons. Statutes are written instruments that all persons are presumed to be aware of and are bound to follow. Statutes, like patents, are enforceable against the public, unlike private agreements between contracting parties.”<sup>145</sup> Thus, while a patent is granted by an agency and is not enacted by Congress, patents and statutes do share several similarities, particularly the function of establishing rights of which the public is presumptively aware. These rights derive directly from the federal government through the substantive review and grant afforded by the PTO.

Members of the public look to patents as a signal of something beyond mere technical information, such as a signal of the firm’s innovativeness. There is no reason why patents cannot communicate other, non-commercial messages. Previous experience demonstrates that, like statutes, patents can communicate signals of morality. Controversies over biotechnology patents confirm that the public does make the link between a patent and potential moral signaling from the federal government.<sup>146</sup> The public looks at what is being granted because the government is giving its imprimatur on the disclosed invention.<sup>147</sup> The patent system is in essence an incentive system by the government to encourage innovation that in

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144. John R. Thomas, *Liberty and Property in the Patent Law*, 39 Hous. L. Rev. 569, 582 (2002) (“Patents may be conceived as a sort of private legislation.”).

145. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 987 (Fed. Cir. 1995) (en banc), *aff’d* 517 U.S. 370 (1996).

146. See Bagley, *supra* 12, at 473 (“The patent [on cloning products] and news reports of other human cloning activity drew critical reaction, commentary, and calls for legislative action from a variety of sources.”).

147. *Id.* at 475–76 (acknowledging that, while banning patents on morally controversial subject matter will not halt research in those areas, “[t]he availability of a government imprimatur granting exclusive rights over morally controversial inventions is especially problematic in the area of biotechnology because no one should ‘own’ and the government should not encourage certain inventions”).

some circumstances may be of morally questionable subject matter.<sup>148</sup> The grant of the patent informs the public that the government has deemed the disclosed invention as worthy of the governmentally granted right to exclude.

Patents undisputedly can serve as the government's "stamp of approval." Patents can "legitim[ize] novel technologies and the theories they apply."<sup>149</sup> They can "validate inventions" of questionable scientific credibility.<sup>150</sup> The same impact could be had on morally questionable inventions: the patent validates these inventions as legitimate, ethical science. Because the patent is awarded by the government after careful review, it communicates that this morally questionable subject matter has legitimacy.

The salience of this position is clearer if patents are considered as a form of government subsidy.<sup>151</sup> Few would deny that the federal government has the ability (and perhaps the obligation) to deny direct funding to morally objectionable research. We do not want our tax money going into research that is offensive. A patent is effectively indirect federal funding: the government's grant of the patent requires the public to pay for the invention due to the exclusive rights afforded under the patent. Therefore, denying patent protection (while paradoxically allowing the use of the invention to be even more widespread<sup>152</sup>) does seem reasonable. The same would be the case if the government simply was distributing research grants: denial of funds would not stop research into the technological area, but likely would slow such research while also expressing government concerns with the technology. The recent denials of federal funding on stem cell research exemplify the reality that government subsidies are laced with moral considerations.<sup>153</sup>

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148. *Id.* at 476.

149. Lee, *supra* note 12, at 676.

150. *Id.*

151. See Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 TEX. L. REV. 1031, 1032 (2005) (arguing that patents should be viewed as government subsidy). Whether intellectual property should be considered as "property" as opposed to a form of government subsidy is the subject of considerable debate. See *generally id.* at 1033–46 (discussing the rise of the view of intellectual property as a form of property).

152. If patent protection is denied, then no one has the right to exclude others from practicing the invention. Unless held as a trade secret, the technology becomes free for others to practice. Even if the invention is held as a trade secret, independent discovery would permit third parties to use the technology free of liability. Denial of patent protection, however, lessens the incentive to engage in such research, so there might be some slowing of development in a morally questionable area, just as denial of federal funds would slow, although not stop, research into certain areas. The recent stem cell controversies are exemplary of this dynamic.

153. See Christopher Robertson, *Recent Developments in the Law and Ethics of Embryonic*

The mere grant of a patent—independent of the whether the technology develops—implicates moral concerns. Passed in an appropriations bill in 2004, the Weldon Amendment precludes the PTO from using any of its funds to issue a patent with “claims directed to or encompassing a human organism.”<sup>154</sup> Congressman Dave Weldon was concerned with the commodification of humanity, where “technology can be used to undermine what is meant to be human, including the exploitation of human nature for the purpose of financial gain.”<sup>155</sup> Weldon noted that “[j]ust because something can be done does not mean that it should be done . . . We should not allow such researchers to gain financially by granting them an exclusive right to practice such ghoulish research.”<sup>156</sup> Significantly, and paradoxically to some, denying patents, or precluding their issuance due to funding limitations, will not stop the creation of such technology. Patent denial means that anyone who develops the technology will be free to use it, absent regulatory or legal restraints on such technologies that arise outside of the patent laws. The ban does remove the government-provided incentive to develop such technologies. Fears of and objections to patenting humans, therefore, must be rooted in something broader—the idea that patents can express government endorsement of morally objectionable technologies.<sup>157</sup>

Similar concerns with the ability of patents to communicate a message of moral endorsement of technologies by governments is apparent in international patent treaties. The Agreement on Trade-Related Aspects of Intellectual Property (TRIPS) allows signatories to exclude from patentability inventions on the basis of morality and the *ordre public*.<sup>158</sup> Governments may wish to create a disincentive to the development of such inventions by precluding patent protection. The message of such a

*Research: Can Science Resolve the Ethical Problems it Creates?*, 33 J. L., MED. & ETHICS 384, 384 (2005).

154. Consolidated Appropriations Act, Pub. L. No. 108-199, 118 Stat. 101 (2004); see *PTO Issues Patent on Methods for Cloning Mammals, May Run Afoul of Law*, 68 PAT., TRADEMARK, & COPYRIGHT J. (BNA) 485, 486 (2004).

155. 149 CONG. REC. H7247 (daily ed. July 22, 2003) (statement of Rep. Weldon).

156. *Id.*

157. Activists previously had pushed the PTO on the morality of patents related to humans by filing an application for an animal-human chimera. The PTO rejected the application on subject-matter grounds because the invention embraced a human. See *PTO Issues Patent on Methods for Cloning Mammals, May Run Afoul of Law*, *supra* note 154, at 486. The PTO recently issued a final rejection of this application on the basis that the invention was too closely related to a human, notwithstanding that no legal basis exists for that distinction. See Office Action of Patent Application No. 10/308,135 (Aug. 11, 2004) (final rejection) (on file with author); see also Rick Weiss, *U.S. Denies Patent for a Too-Human Hybrid*, WASH. POST, Feb. 13, 2005, at A3.

158. Agreement on Trade-Related Aspects of Intellectual Property, art. 27(2) (1995).

disincentive, however, is merely a moral expression. Denying patent protection does not mean the technology is actually banned. Moreover, because the denial of a patent would not prevent these morally objectionable technologies from developing, these provisions serve only to eliminate the signal of government endorsement. Other incentives operate to encourage scientists to develop such technologies, as can be seen in the context of cloning humans.<sup>159</sup> Thus, the only purpose for such exclusions is to allow governments to avoid granting the patent on these controversial inventions and to avoid the government's perceived endorsement or encouragement of these morally questionable inventions.

The public has already become aware of controversial patents, confirming the ability of individual patents to communicate information to the public-at-large. There has been considerable media coverage of, and outcry against, the patenting of animals, genes, and humans generally.<sup>160</sup> As such, patents could serve to communicate a message to the public, both gay and straight, that gays and lesbians are inferior or defective in some sense. In light of the public nature of patent rights and the already demonstrated ability of patents to transmit information beyond simply explaining the scope of exclusive rights, patents can have effects similar to that of legislation, including expressive impacts.

## 2. *The Utility Standard: Does a Patent Inform Us What is Normatively "Good"?*

While patents and the inventions disclosed therein can intersect with morally questionable subject matter, the key aspect of an expressive harm is from the government's assessment that an invention is "good" and worthy of a patent. This element is the utility standard of patent law. An invention must have utility in order to be eligible for patent protection.<sup>161</sup> Generally, the utility requirement is easy to satisfy: an invention will be useful "if it actually works to achieve at least one of its stated purposes."<sup>162</sup> The inventor must demonstrate that the invention has only

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159. S.J.R. Bostyn, *The Prodigal Son: The Relationship Between Patent Law and Health Care*, 11 *MED. L. REV.* 67, 120–21 (2003).

160. See Rebecca Dresser, *Ethical and Legal Issues in Patenting New Animal Life*, 28 *JURIMETRICS J.* 399, 399–400 (1988) ("Although patent law experts and biotechnology companies greeted the decision as a welcome and logical extension of existing patent law, the action triggered a much less favorable response from the media, a variety of political and religious groups, and some members of Congress.").

161. 35 U.S.C. § 101 (2000).

162. Gitter, *supra* note 36, at 1662–63.

one use that benefits society, even if there are numerous other uses that would be detrimental. The courts and the PTO generally use the utility requirement to reject inventions that belie scientific laws, such as a perpetual motion machine.<sup>163</sup> Only in the chemical context is utility really an issue—the mere knowledge of a chemical structure is insufficient for a patent unless a use for the chemical is known. For mechanical devices, utility is rather simple to demonstrate—the mousetrap either snaps closed or it does not. The PTO recently issued guidelines for establishing utility to deal with complications arising from the patenting of human genes and gene fragments. The standard set in the guidelines is that an invention must have a substantial, specific, and credible utility to be eligible for patent protection.<sup>164</sup>

Historically, the utility requirement also contained a morality component: inventions viewed as immoral lacked utility per se and were ineligible for patent protection.<sup>165</sup> For example, the PTO at one time viewed patents on gambling machines as ineligible for patent protection because their only use was immoral.<sup>166</sup> Moral utility appears to be withering away.<sup>167</sup> In *Juicy Whip, Inc. v. Orange Bang, Inc.*,<sup>168</sup> the Federal Circuit reversed the judgment of the district court, which had concluded the invention lacked utility because its sole purpose was to deceive consumers.<sup>169</sup> The Federal Circuit distinguished Justice Story's morality-based view of utility. Noting that this principle "has not been applied broadly in recent years,"<sup>170</sup> the court concluded that there was "no basis in section 101 to hold that inventions can be ruled unpatentable for lack of utility simply because they have the capacity to fool some members of the public."<sup>171</sup>

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163. Interestingly, the PTO used to include cures for baldness in this category. *See, e.g., In re Ferens*, 417 F.2d 1072, 1074 (C.C.P.A. 1969); *In re Oberweger*, 115 F.2d 826, 829 (C.C.P.A. 1940).

164. *See* Utility Examination Guidelines, 66 Fed. Reg. 1092, 1094 (Jan. 5, 2001).

165. *See, e.g., Lowell v. Lewis*, 15 F. Cas. 1018, 1019 (C.C.D. Mass. 1817) ("All that the law requires is, that the invention should not be frivolous or injurious to the well-being, good policy, or sound morals of society. The word 'useful,' therefore, is incorporated into the act in contradistinction to mischievous or immoral.").

166. *See, e.g., Brewer v. Lichtenstein*, 278 F. 512 (7th Cir. 1922). The PTO now does allow patents on gambling devices. *See* *Ex parte Murphy*, 200 U.S.P.Q. (BNA) 801 (PTO Bd. App. Apr. 29, 1977).

167. *But see infra* notes 181–88 and accompanying text (exploring PTO's reliance on morality post-*Juicy Whip*).

168. 185 F.3d 1364 (Fed. Cir. 1999).

169. *Id.* at 1366.

170. *Id.* at 1366–67.

171. *Id.* at 1368.

Consistent with this amoral approach to utility, the PTO has rejected all morality-based arguments against patenting human genes. Specifically, the PTO rejected the argument that “patents should not issue for genes because the sequence of the human genome is at the core of what it means to be human and no person should be able to own/control something so basic.”<sup>172</sup> The PTO reasoned that genes, as a discovery,<sup>173</sup> are patentable so long as they satisfy the statutory requirements for obtaining a patent—novelty, non-obviousness, utility, and the disclosure requirements of 35 U.S.C. § 112.<sup>174</sup> Because patents “do not confer ownership of genes, genetic information, or sequences,” but instead confer only the right to exclude others from utilizing the invention, the risk of an entity “owning” someone else’s genes is unfounded.<sup>175</sup> The PTO’s approach is neutral and scientifically objective: the PTO will apply the statutory standards without regard to the moral implications of the underlying invention.

Utility is an inherently relative concept, however. One person’s invention on a drug delivery system could be another person’s suicide machine. The patent laws do not define the proper population segment by which utility must be addressed. The “at least one use” standard would seem to include small, discrete populations. The utility guidelines do not elucidate as to whom that one benefit must inure. Is it society as whole? If a patented invention could be used harshly against one segment—perhaps a minority—should that be viewed as useful, even if the benefit afforded to the majority is slight? Is there an implicit cost/benefit analysis that should be performed, in that the benefit to society as a whole must be greater than the cost to society, or is merely one benefit, regardless of other potential costs, sufficient? Present PTO law seems to suggest the latter—there need be only one use, regardless of the harms from the invention and indeed regardless of whether the harms outweigh the benefits. No policy balancing takes place.

As an administrative matter, the lack of balancing may make sense. The PTO is not in a position to assess all of the potential consequences of a given invention, whereas, through the disclosures of the patentee, they

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172. Utility Examination Guidelines, 66 Fed. Reg. at 1093.

173. For an argument that genes, even as isolated and purified products of nature, should not constitute a “discovery” under the Constitution and Patent Act, see generally Linda J. Demaine & Aaron Xavier Fellmeth, *Reinventing The Double Helix: A Novel and Nonobvious Reconceptualization of the Biotechnology Patent*, 55 STAN. L. REV. 303 (2002). See also Timothy R. Holbrook, *The Treaty Power and the Patent Clause: Are There Limits on the United States’ Ability to Harmonize?*, 22 CARDOZO ARTS & ENT. L.J. 1, 10–11 (2004).

174. See Utility Examination Guidelines, 66 Fed. Reg. 1092, 1094 (Jan. 5, 2001).

175. See Utility Examination Guidelines, 66 Fed. Reg. at 1094.

are in a relatively good position to assess the benefits. Thus, administratively, the lack of a balancing approach may be efficient.<sup>176</sup> As patents continue to issue on genes and other aspects of humankind that implicate who we are, as opposed to what we do, then perhaps reconsideration of the lack of balancing is appropriate, particularly as discoveries are made that relate to non-pathological conditions.

To demonstrate this concern, this Article will consider as a thought experiment the implications of patenting a method of altering sexual orientation. Suppose that a scientist invents a method of changing the sexual orientation of a patient from gay to straight. Such a conversion suggests that homosexuality is pathological and should be remedied.<sup>177</sup> The question is whether a method to convert a homosexual to a heterosexual satisfies the utility requirement of patent law and accordingly should be patentable. To some in the heterosexual community, a method to convert gays to straights might be viewed as useful. It would maintain the status of heterosexuality as the norm and, for those who are opposed to gay rights, it would provide a basis for objecting to legal protections for gays and lesbians. In the extreme, there would be a risk of forced participation in conversion programs by parents, particularly of under age gays and lesbians, or for the use of the technology in utero. Gays and lesbians would be further marginalized because their status would now no longer be immutable.

Now suppose that a method to alter sexual orientation is discovered, but the effected conversion is only from straight to gay. Would the patent system view this invention as satisfying the utility requirement? The answer may hinge on the relative nature of the utility requirement. From the perspective of the majority, homosexuality is not the norm and thus such a conversion would not be useful. This approach would feed the fears of the majority of a systemic “conversion” campaign by gays and lesbians to recruit straight people into their ranks. Conservative organizations would never stand for a grant of exclusive rights for changing a person into a gay or a lesbian, and in the current political environment, the issuance of such a patent seems highly unlikely. From the perspective of gays and lesbians, however, such an invention could be useful. A gay or

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176. Cf. Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495 (2001) (arguing that, given the few patents actually litigated or licensed, devoting more resources to the review of patents at the PTO would be wasteful).

177. See Larry Thompson, *Search for a Gay Gene*, TIME, June 12, 1995, at 60–61 (June 12, 1995) (“The Rev. Louis P. Sheldon, president of the Traditional Values Coalition in Anaheim, California, says that if a biological cause of homosexuality is found, then ‘we would have to come up with some reparative therapy to correct that genetic defect.’”).

lesbian couple who is having a child, for example, may prefer to have a gay or lesbian child as well. To the extent that parents want to see themselves in their children, some gay or lesbian parents may prefer to have a homosexual child.<sup>178</sup>

The utility standard in this case is more perplexing, even though the genetics or biological pathways involved with this hypothetical likely are the same as the first scenario. The biological processes creating predispositions towards homosexuality also likely implicate predispositions to heterosexuality. The benefit here would accrue only to a small segment of society, although the benefit to that small segment could be immense. The majority would seemingly be unharmed, although strong political and moral resistance to such technology, and the patent itself, would be likely.

Nevertheless, the patentability of a method to convert heterosexuals seems in serious doubt. This point is even more salient if one considers the other groups implicated by the potential expressive harms from patents, the deaf, dwarfs, and high-functioning autistics. For example, deaf parents very well may prefer to have a deaf child, so such an invention allowing them to have a genetically deaf child could be useful to them. It seems highly unlikely, however, that the PTO would view an invention that ensures a deaf child would be viewed as useful, notwithstanding the value to the parents.

The patentability of these two conversion hypotheticals is not the only relevant consideration in assessing the potential impact the patent system could have. The relative patentability of these two scenarios also merits contemplation. If the patent office were to grant a patent on one but not the other, what would be the implications for the patent system and society? A modification of this thought-experiment elucidates the potential consequences of this concern. Given the two possible scenarios—a method to change gays to straights or straights to gays (or, to make people hear and make them deaf, to make them dwarfs or of statistically normal height, etc.)—four permutations for PTO action follow: (1) grant patents for both transformations; (2) deny patents for both; (3) allow patent protection for the transformation from straight-to-gay (or hearing-to-deaf, etc.); and (4) allow patent protection only for reverse transformation (gay-to-straight; deaf-to-hearing, etc.).

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178. It could also result, of course, in the abortion of a heterosexual fetus. LEVAY, QUEER SCIENCE, *supra* note 24, at 267 (“In fact, there might also be some lesbians who, desirous of having a lesbian or gay child, would abort a fetus that was predisposed to become heterosexual.”).

<i>Grant both</i> Grant patent on gay-to-straight Grant patent on straight-to-gay	<i>Differential grant #1</i> Grant patent on gay-to-straight Deny patent on straight-to-gay
<i>Differential grant #2</i> Deny patent on gay-to-straight Grant patent on straight-to-gay	<i>Deny both</i> Deny patent on gay-to-straight Deny patent on straight-to-gay

*a. Grant Patents on Both Gay-to-Straight and Straight-to-Gay*

The first permutation is if the PTO were to allow claims covering methods for conversion in either direction. If the PTO were to grant a patent on both, then the expressive impact would be more limited. Under this scenario, the PTO would interpret the utility requirement to reflect the value that either scenario would have to the respective groups. This would be a true application of the “single benefit to one” approach that is ostensibly the current rule. The grant of the patent here arguably is morally neutral and would not be construed as suggesting that the government views heterosexuality as superior to homosexuality.

This seemingly neutral approach could communicate a negative expressive message nevertheless. While it is true that under this scenario the patent would seem to express indifference towards either straights or gays, the societal context must be considered. The neutrality of the invention, and its corresponding patent, may not negate the marginalization of the technology. The concern for these marginalized communities could very well be that the technology, notwithstanding its seeming neutral face, will be used disproportionately against them.

This bias can be seen clearly in the rhetoric surrounding biological research into homosexuality. Important with respect to all of these investigations is that science is not exempt from biases.<sup>179</sup> If the search was truly objective, the search would be for “sexual orientation,” but all of the investigations are looking for the cause of homosexuality. By emphasizing homosexuality, they inherently suggest that homosexuality (or any variant from heterosexuality) is outside the norm. The science remains inherently hetero-centric, which has significant consequences for the potential expressive impact of patents on these processes. Given the bias surrounding this research, even a facially neutral technology could

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179. Dreyfuss & Nelkin, *supra* note 15, at 339 (“But the image of neutrality . . . is largely a myth . . . . Defining what is ‘natural,’ science is readily appropriated as a way to conform individuals to institutional values and existing social or political conventions.”).

easily be viewed as hostile to the interests of gays and lesbians. Even if members of the gay community might choose to use such inventions, it does not mean the invention is in fact neutral:

a heterosexual child might be preferable for reasons that might appear most salient to homosexuals themselves in lieu of the discrimination they have encountered. The use of a technology by people against whom it may discriminate (even if they attempt to use it to their benefit) does not establish its neutrality.<sup>180</sup>

Thus, even a facially neutral technology can be discriminatory. Similarly, the grant of an apparently neutral patent can still express a message of discrimination and marginalization to the relevant groups. The “utility” standard would be satisfied, reinforcing the idea that homosexuality is outside the norm and akin to a pathological condition. So, the seemingly neutral “grant to both” may yet inflict an expressive harm.

*b. Grant Patents on Neither*

Another option to consider would be that the PTO rejects all variations of the invention, deeming them as lacking utility. The PTO could decline to issue patents on these processes, resulting in a minimal expressive impact. Of course, the PTO must have a basis to reject these applications. Seemingly the only basis for rejecting both would be on a morality ground, which is disfavored under present law.

A recent rejection at the PTO office, however, suggests that use of morality may yet resurface at the PTO, offering the potential for rejection of both inventions. An examiner at the PTO recently rejected an application directed to animal-human chimeras, and one of the bases for this rejection was utility.<sup>181</sup> In her utility analysis, the examiner did not limit her consideration to scientific or industrial usefulness. Instead, she distinguished the Federal Circuit’s seeming evisceration of moral utility in *Juicy Whip* and drew upon Justice Story’s formulation.<sup>182</sup> The examiner

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180. Udo Schüklenk, Edward Stein, Jacinta Kevin & William Byrne, *The Ethics of Genetic Research on Sexual Orientation*, 27 HASTINGS CENTER REPORT 6, 12 (1997).

181. Office Action on Patent Application No. 10/308,135 at 21–24 (Dec. 3, 2002) (on file with author) [hereinafter Non-final Rejection]; see also Office Action on Patent Application No. 10/308,135 at 21–22 (Aug. 11, 2004) (on file with author) [hereinafter Final Rejection] (final rejection relying on same basis as non-final rejection).

182. Non-final Rejection at 21–22. The examiner reasoned that *Juicy Whip* dealt with the need for the patent system “not to displace the police powers of the state or other federal agencies.” *Id.* at 22.

acknowledged that “[t]he question of whether humans should be the subject of exclusive patent rights raises grave issues going to the core of what a ‘useful’ invention is.”<sup>183</sup> In embracing the utility standard in the patent statute, Congress was presumptively aware of the moral utility doctrine and “did not disavow” it.<sup>184</sup> The examiner recognized that utility in this context is one of public policy, one that “takes into account the common sense of the community.”<sup>185</sup>

As such, the examiner concluded that Congress, not the PTO, should be the first to address this public policy issue, and that for the PTO to grant such a patent would “usurp the power of Congress to speak first to these issues.”<sup>186</sup> She expressly recognized that “utility,” as simply a technical standard, is one infected with public policy:

The discretion to consider the well-being and good policy of society implicit in the statutory term “useful” is properly applied when a refusal to grant a patent is necessary to avoid preempting the power of Congress to define essential questions of public policy. . . . [T]he USPTO would be acting improperly in the place of Congress to “fill a gap” in the law if it were to grant a patent covering human beings; it acts pursuant to soundly based deference to the constitutionally empowered institutions of government in denying such a patent application.<sup>187</sup>

Thus, in this context, the examiner recognized that “utility” is infused with public policy concerns and that consideration of the “community” (whoever that community may be) is important. Technically, of course, these observations are only those of one particular examiner and do not establish PTO policy. Given the intense public scrutiny given this particular application, however, it seems highly likely that policymakers at the PTO were involved in drafting the office action. The PTO therefore has plausible deniability—while effectively an expression of policy by the PTO, it is legally only the views of one examiner which cannot be used to bind the entire PTO, if the PTO decides to change its stance. Additionally, the idea of denying the patent in order to allow Congress to consider the issue first is inconsistent with the Supreme Court’s reasoning in *Diamond v. Chakrabarty*, where the court allowed the patenting of a life form and

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183. *Id.* at 22.

184. *Id.* at 21–22.

185. *Id.*

186. *Id.* at 22–23.

187. *Id.* at 23.

noted that it is for the courts to decide patent eligibility in the first instance.<sup>188</sup>

At a minimum, however, this language shows that the PTO is indeed aware of the relativity of utility. Its reference to “community” seems to mean the entire U.S. society, but necessarily communities can be of varying sizes. What is useful to one community seemingly may not be useful, and indeed may be harmful, to another. Thus, the PTO could root a decision denying patent protection on all forms of such “conversion” technologies.<sup>189</sup> The flat denial of patent protection would send a rather sharp expressive message that such eugenic-like technologies are not properly within the ambit of the patent system.

*c. Differential Grant #1: Grant Patent Only on Gay-to-Straight*

The use of the morality lever could cut in a much more hostile manner towards gays and lesbians. The PTO could treat such processes differently and afford patent protection for only gay-to-straight conversions or for methods of preventing homosexuality. Granting technologies in this discriminatory manner undeniably would inflict a clear expressive harm on homosexuals. The “usefulness” of the patent is to cure homosexuals, reinforcing the view that gays are pathologically flawed. Given the role of patents as showing the imprimatur of the government, these grants would imply that U.S. government views technologies that convert gays to straight as normatively good. The same would be true for the other relevant groups—that we view those communities as flawed in a way that needs to be corrected. This reality is very stark in the context of the deaf and other biologically influenced groups, where patents on technologies to cure deafness would send a signal to these groups that they should be cured. If the PTO were to explicitly allow patent protection only for these methods of curing, then there would be considerable expressive consequences.

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188. *Diamond v. Chakrabarty*, 447 U.S. 303, 308–09 (1980). The PTO had denied the patent application originally, apparently attempting to use the approach espoused by the examiner here and ultimately rejected by the Supreme Court. See Bagley, *supra* note 12, at 486–88.

189. Although this part deals with the hypothetical of true “conversion” technologies, even more complexities would arise in the real world. What exactly would constitute a “conversion” technology? A prenatal test developed to identify the likely sexual orientation of a fetus (or likelihood of deafness, dwarfism, etc.) itself is not directly a conversion technology, but that information could easily be used to terminate the pregnancy. This issue of classifying the type of technology adds considerable complexity to the issue.

*d. Differential Grant #2: Grant Patent Only on Straight-to-Gay*

The final option in this thought experiment is that the PTO would issue patents only on straight-to-gay conversions or the prevention of heterosexuality—in other words, “cures” for heterosexuality. If the PTO granted a patent on such a method, then value to the gay and lesbian community under this view would be recognized. A positive message would be sent that recognizes that some members of this community may want to have offspring that share their genetic traits. The odds that the PTO would indeed allow such a grant seems slim, if not impossible given the political consequences of such an act. This point again is more poignantly made if we consider the deaf or autistics. It seems unlikely that the PTO would view as “useful” processes to guarantee the birth of a deaf or high-functioning autistic child.

These four scenarios afford considerable insight on the potential expressive harms from granting patents in this area. Looking at these four possible scenarios, the possibility of expressive harm is reduced if the two processes are treated the same—denying protection on both or granting protection for both. These scenarios are of course hypothetical: they assume that the PTO would actually be presented with patent applications for both processes simultaneously.

The reality is, however, that the current system on its face offers no opportunity for balancing such concerns, but the PTO’s own words in the human-animal chimera application show that it is aware of this issue and is willing to rely upon community concerns and morality in assessing utility. Its objectivity therefore is over-stated, giving the concerns about differential grants of patents involving sexual orientation considerable traction.

*3. The Nature and Scope of the Claim*

The first two factors—whether patents are like statutes and the utility standard—are essential in assessing whether any expressive communication could emanate from the grant of a patent. The remaining factors relate more to the strength of such a signal and whether the expressive message could be lost in other noise.

One key aspect of any communication would be the nature of the disclosed invention itself and the scope of the patent’s right to exclude. A patent claim can be directed to a process, machine, manufacture, or

composition of matter.<sup>190</sup> Machines and manufactures generally are not implicated for inventions relating to biology. Whether the invention is a process or method, in contrast to a composition of matter, could affect the extent of an expressive message significantly. The above hypothetical helps demonstrate this point. If the invention is a method to alter or modify sexual orientation, the expressive impact would be greater, whereas a claim to a gene or protein that influences sexual orientation would be more ambiguous. A method claim must identify a particular outcome, which would highlight the purpose of the invention. Method claims therefore would inflict expressive harms more directly.

In contrast, a claim for a composition of matter only covers the structure of that compound. The specification will have to identify a use for the compound, but biological materials often can have multiple functions.<sup>191</sup> Originally, scientists believed the human genome could contain upwards of 80,000 genes.<sup>192</sup> This number, thanks to the Human Genome Project, has proven to be a gross overestimation. The current estimate is around 25,000 genes.<sup>193</sup> The consequence of this relatively small set of genes is that a single gene performs numerous functions.<sup>194</sup> Genes that implicate sexual orientation may be relevant in other biological processes. The expressive impact of a patent that discloses both a function related to sexual orientation and one unrelated to orientation could differ from that of a patent directed solely to a gay gene. Particularly, suppose the claim is merely to a gene with a given sequence, and the specification discloses a variety of functions, one of which happens to be influencing sexual orientation. The expressive message would seem to be muted in that context given the multiplicity of function.

The level of muting, however, would not be significant. While a compound claim may not produce as strong of a signal as a method claim, a claim to a biological product influencing sexual orientation would still likely provide a strong signal given the cultural and social context of homosexuality. The fact remains that one reason the patent on this gene is considered useful is that it influences sexual orientation, again suggesting

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190. 35 U.S.C. § 101 (2000).

191. See, e.g., Ted J. Ebersole et al., *Patent Pools and Standard Setting in Diagnostic Genetics*, 23 NATURE BIOTECHNOLOGY 937, 937 (2005).

192. RIDLEY, *supra* note 61, at 5 (“There are probably 60,000–80,000 genes in the human genome . . .”).

193. See Anthony L. Komaroff & George Q. Daley, *Harnessing Stem Cells*, NEWSWEEK, Dec. 6, 2004, at 54. Previous analyses had suggested 30,000–40,000 genes. See Gitter, *supra* note 36, at 1633.

194. Cf. Gitter, *supra* note 36, at 1671 (noting the potential for “subsequent researchers later [to determine that the DNA segment was involved in other illnesses”).

that such knowledge and the potential to modify such genes is a societal good. The mere pursuit of this scientific inquiry is infected with prejudice and homophobia.<sup>195</sup> As one commentator has noted, “there hasn’t been one instance in history where the results of etiologic sexual orientation research have not been used against gay people. On the contrary, virtually every ‘cause’ of homosexuality has been accompanied by attempts to ‘heal’ gay people.”<sup>196</sup> Investigations into the biological origins are not truly value-neutral given the context of gays and lesbians in today’s society because “the very motivation for seeking the ‘origin’ of homosexuality has its source within social frameworks that are pervasively homophobic.”<sup>197</sup> Thus, even a patent on the gene itself, although arguably neutral in application because it could affect both gay and straight sexual orientation, is pregnant with an expression of marginalization given the homophobic context of society.

Where this issue may be more important may not be the question of whether there is an expressive communication, but whether or not to do anything about such communication given that the gene has other uses aside from influencing sexual orientation.<sup>198</sup> We may simply conclude that, given the complexity of genetic science, parsing patent rights on possible expressive harms simply is not worth it.

#### 4. *Who is the Inventor or the Owner?*

Unlike legislation, the PTO can only pass judgment on the applications presented to it by inventors. This begs the question of whether the identity of the inventor could serve to mitigate or exacerbate an expressive signal from the granting of a patent. For example, because Hamer is sympathetic to gay and lesbian causes, arguably his obtaining a patent on the gay gene would not deliver as harsh an expressive impact. In contrast, if someone from the National Association for Research and Therapy of Homosexuality (NARTH), a group of psychiatrists who still view homosexuality as a pathological disorder, were to discover a gay gene, the

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195. Udo Schüklenk, *Science, ‘Gay Genes’, and the ‘Third Sex’*, GAY AND LESBIAN HUMANIST (Spring 1997), available at [www.galha.org/glh/163/etiology.html](http://www.galha.org/glh/163/etiology.html).

196. *Id.*

197. Schüklenk et al., *supra* note 180, at 9.

198. One possible variation would be to strike references in the patent to the gene’s role in sexual orientation. Such a change would be recorded in the prosecution history of the patent and could thus express the alternative message—that the government via the PTO does not view genes on non-pathological conditions as worthy of patent protection in any shape or form. Admittedly, the patent would still give protection to the gene, regardless of how it is being used, but the government act of striking the utility vis-à-vis sexual orientation would communicate an alternative message.

expressive impact could be more harmful. The motivation behind the inventor's technology would differ, and the resulting communication from the patenting of the technology could vary depending on the inventor's intent behind developing it.

Overall, inventor identity likely would not have a significant impact on the strength of the signal. The expressive theory articulated here suggests the harm is originated by the government's grant of the patent. As such, the identity of the inventor may not matter—the government has expressed its view that a gay gene satisfies the utility requirement, notwithstanding its relative nature. The mere existence of the patent emphasizes the view of gay-as-pathology. Moreover, the inventor's interest in keeping the invention out of unscrupulous hands is almost impossible to maintain. She may have the right to exclude others, but the information surrounding her invention is disclosed to the public. Indeed, once the patent has expired, anyone can use this information, including NARTH. The inventor's lack of control over the information, and eventually the invention itself, also suggests that the identity of the inventor may not have a significant effect on the expressive impact.

In fact, it is likely that the identity of the inventor will be irrelevant to the gay and lesbian community:

In addition, the fact that the current wave of scientists working in the area are either themselves gay, or are well disposed to gay people, tends to diminish anxiety that the research is intended to harm the gay community. Nevertheless, some gays and lesbians still express the fear that science is likely to harm them, whatever the sympathies of the scientists themselves.<sup>199</sup>

Thus, the identity of the inventor or owner would have little bearing on the expressive harm resulting from the grant of the patent.

##### *5. The Nature of the Characteristic at Issue*

The potential for expressive harms from patents will also depend on how closely the behavior or condition is associated with a person's identity. For homosexuals, generally the link between their orientation and their identity is strong and intimate. Similarly, other conditions where the link between behavior/condition and identity are strong could include the deaf and dwarfism, where these communities do not view their condition

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199. LEVAY, *QUEER SCIENCE*, *supra* note 24, at 147.

as necessarily pathological or in need of curing. Other conditions may not have as strong a link to identity. A patent on aggression, for example, would not generate an expressive harm because most people do not define themselves as an individual through their aggressiveness. Other possible conditions, such as obesity, might fall somewhere in the middle of the identity spectrum. At some point, though, such as discovery of genes that affect certain ethnic groups more particularly, the significant impact of the disease may outweigh expressive consequences of the patent itself. In fact, concepts of race and ethnic origin may become more strongly implicated as exploration of genetic differences between people continues.

### *C. Assessing the Potential for Expressive Harms from Patents*

As genetic and biological research shifts away from conditions that are indisputably pathological, patents in this area will increasingly bear on what is considered to be good, particularly due to patent law's utility requirement. The above analysis shows that there is considerable potential for expressive harms to result from the granting of patents in these controversial areas. As with any sort of signal, the strength of the signal may vary.<sup>200</sup> The fact that signal strength may vary, though, does not undermine the fact that the signal exists. There almost certainly will be some sort of message of inferiority or pathology communicated to the groups impacted by these technological developments. The message is that the government, through the grant of a patent, believes that technologies that may help eliminate these conditions, and therefore these groups, is normatively good.

In essence, the government is approving privatized eugenics. What is considered "normal" versus "pathological," while arguably objective scientifically, is necessarily infected with moral and cultural values.<sup>201</sup> This bias can readily be seen in the context of sexual orientation: the search is for a "gay gene," not "the sexual orientation gene," even though necessarily such a gene would be relevant in the development of a

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200. Cf. Long, *supra* note 7, at 660–63 (discussing noise in signals to investors).

201. See Rosario, *supra* note 54, at 6 ("[T]he 'normal' and the 'pathological'—in their very quantitative arbitrariness—disguise the cultural and moral values they perpetuate."); Anne Fausto-Sterling, *How to Build a Man*, in *SCIENCE AND HOMOSEXUALITIES* 219, 224 (Vernon A. Rosario ed., 1997) ("Because they represent scientific findings, one might imagine that they contain no preconceptions, no culturally instigated belief systems. But this turns out not to be the case. Although based on evidence, scientific writing can be seen as a particular kind of cultural interpretation—the enculturated scientist interprets nature."); Dreyfuss & Nelkin, *supra* note 15, at 333 (describing "persons at risk" due to genetic condition as "people whose physical condition removed them from the class of normalcy").

heterosexual orientation as well as a homosexual one.<sup>202</sup> No matter how objective any individual method or research may be, political and moral considerations will infect the results.<sup>203</sup> Consequently, the general public would view the issuance of a patent on a gene affecting sexual orientation as a patent covering a “gay gene.” Such research is inextricably linked not only with what causes homosexuality but also with what it means to be a homosexual.<sup>204</sup>

The medicalization of homosexuality in the past has been used to stigmatize and marginalize homosexuals.<sup>205</sup> The threat to these groups of eugenic application of these technologies to eliminate them is real.<sup>206</sup> Eugenics conflates science with the moral.<sup>207</sup> Consequently, these technologies easily can be viewed not only as a threat to the human dignity of gays and lesbians but also as a threat to their existence.<sup>208</sup> Biological

202. LEVAY, *QUEER SCIENCE*, *supra* note 24, at 221 (“I have never heard of a single instance of a heterosexual, whatever problems he may have been facing, inquiring about the nature and origins of heterosexuality, or asking why he was a heterosexual, or considering these matters important.” (quoting F.E. Kameny, *Does Research into Homosexuality Matter?*, *THE LADDER* 14–20 (1965)); LEVAY, *QUEER SCIENCE*, *supra* note 24, at 5 (“What should be emphasized, though, is that seeking the cause of homosexuality is really the same thing as seeking the cause of heterosexuality . . . . If ‘gay genes’ make a person gay, then ‘straight genes’ make a person straight . . . . When we study homosexuality we are inevitably studying heterosexuality also, even if we do not always express it that way.”); Allen, *supra* note 35, at 251 (“For another, if homosexuality was not viewed as a pathology, then we cannot sensibly ask about its *cause* or *origins* separate from the causes or origins of heterosexuality and sexual practices in general.”).

203. Rosario, *supra* note 54, at 12 (“Despite Hamer[sic] and LeVay’s protests that scientific research on homosexuality should and can be ‘objective’ and apolitical, it should be clear that even if it adheres to the methods and standards of scientific correctness, such research is inevitably interlaced with deeper narratives and hidden motivations that reflect the political climate of the moment as well as the personal aspirations of individual researchers.”).

204. *Id.* at 14.

205. Margaret Gibson, *Clitoral Corruption: Body Metaphors and American Doctors’ Constructions of Female Homosexuality 1870–1900*, in *SCIENCE AND HOMOSEXUALITIES* 108, 108 (Vernon A. Rosario ed., 1997) (“Through these connections, doctors were able to further marginalize and exoticize the female invert or homosexual, and minimize the threat that the existence of such individuals might pose to broader beliefs about sexuality, gender, and intimate relationships.”); Carlston, *supra* note 1, at 177 (noting that historians “have suggested how damaging the internalization of [the concept of homosexuality as pathology and abnormal] could be to people with homoerotic feelings or in homosexual relations”).

206. FUKUYAMA, *supra* note 16, at 85 (“Hanging over the entire field of genetics has been the specter of eugenics—that is, the deliberate breeding of people for certain selected heritable traits.”); Rosario, *supra* note 54, at 6; LEVAY, *QUEER SCIENCE*, *supra* note 24, at 171.

207. GIBSON, *supra* note 205, at 111–12 (“Social Darwinism and the start of the eugenics movement provided a framework in which to discuss moral issues in an increasingly biological way, using the human body not just as a personal unit, but as a representation of the limits to human progress and of regression into an animal past.”).

208. See FUKUYAMA, *supra* note 16, at 39–40. Indeed, the LeVay findings regarding the brain already spurred anti-gay and lesbian groups to attempt conversion methods. LEVAY, *QUEER SCIENCE*, *supra* note 24, at 134.

conversion technologies will undoubtedly be protected by patents, and this eugenic potential informs the potential expressive impact of granting patent rights in this area.

#### IV. PRESCRIPTIVE OPTIONS TO REMEDY THESE EXPRESSIVE CONSEQUENCES

While expressive harms in patent law likely will occur, the mere presence of a harm does not mean necessarily that we should deny patent protection in these contexts. The harms are a cost—albeit a non-economic one<sup>209</sup>—that would need to be weighed against other potential benefits. In some contexts, such as sexual orientation, the benefit of any patent seems low, while expressive harm seems high. If the risk of expressive harm is viewed as significant, we must explore other options to eliminate that harm. For the blind, deaf, dwarfs, and autistics, the reality very well may be that the agnostic approach of “granting both” likely will not come to pass. This section of the Article will explore possible means to address the potential expressive impact of patents, evaluating the benefits and downsides to each approach. As this part will show, none of the solutions are perfect and each imposes its own consequences.

##### A. *Do Nothing: Maintain the Status Quo Neutral Approach Towards Morality*

The most obvious option would be to do nothing. It might very well be that the cost imposed by the expressive harm is not sufficient to require an alteration to the patent system in any significant way. The various factors above demonstrate that, while communication of a message is likely, the strength of that signal may be contingent on numerous factors. As such, the communication may be so muted as to not merit changing the status quo. If the PTO maintains its agnostic approach and would allow patents for both conversions from gay-to-straight and straight-to-gay, then the expressive impact would be significantly reduced. If, however, the PTO does not treat both as equal, as likely would be the case in the context of the blind, deaf, or autistics, then the message would be fairly strong. Maintaining a truly morally neutral approach, and not discriminating on

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209. Cf. FUKUYAMA, *supra* note 16, at 100 (“Utilitarians seldom take into account more subtle benefits and harms that cannot be easily measured, or which accrue to the soul rather than to the body.”).

the technology, would be key to minimizing the expressive harm and would require no change in policy.

Patents on inventions that some find objectionable seemingly have not created significant moral expressions in the past. For example, there are patents on methods of performing abortions, which clearly would implicate messages of the government embracing certain technologies.<sup>210</sup> Although these inventions are not directly related to identity the way that patents on sexual orientation or other behaviors may be, they could support the argument that society has weathered patents on controversial technologies previously and can continue to do so. As such, the burden of fleshing out patents on technologies creating expressive harms may outweigh any potential benefits.

#### *B. Cease Issuing Patents on Human Genes and Gene Fragments*

If one concludes, however, that the harm inflicted on these groups is significant and should be addressed, one approach would be to deny patents on all inventions that relate to human genes. Others have called for a similar ban because patents inhibit innovation<sup>211</sup> or because genes are naturally occurring substances ineligible for patent protection.<sup>212</sup> The potential for expressive consequences adds another basis for objecting to these types of patents.

This approach, however, is both over- and under-inclusive in resolving the possibility of expressive harms. A complete ban on gene patents would eliminate protection not only for those patents with the potential for an expressive harm but also for those that are genuinely directed to conditions that need to be cured, such as various cancers or schizophrenia. A complete ban would thus be an overly inclusive solution, and indeed might create more harm than good by eliminating the patent incentive for research into areas that undeniably relate to pathological conditions.

A ban, moreover, would be under-inclusive. As the discussion of the biology of homosexuality demonstrated, many behavioral characteristics may not be genetically determined but instead may be influenced by non-genetic, biological situations, such as in utero hormone levels. The burgeoning field of proteomics further shows that the expression of a trait

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210. See Thomas, *supra* note 144, at 580–81. Professor Thomas views these patents as privatized regulation that denies access to these technologies, but the grant of the patent could signify government endorsement of the technique as well.

211. See Heller & Eisenberg, *supra* note 36, at 698.

212. See generally Demaine & Fellmeth, *supra* note 173.

may be controlled not only at the genetic level but also at the protein level.<sup>213</sup> A ban on gene patents alone, therefore, still permits patents on various proteins and biological processes, which still have the potential to create an expressive harm. Moreover, methods of curing would also seem to escape a proscription on gene patents. Thus, while the potential expressive harms from patents add some additional support to recent calls to stop granting patents on human genes and gene fragments, this approach would not adequately solve the problem.

*C. Allow the PTO to Assess Whether the Expressive Impact Outweighs the Benefits of Granting the Patent*

Another possibility would be to allow the PTO or the courts to assess the expressive impact of a patent in assessing the patent's validity. The PTO would seem to be on the front lines, as it will first encounter these patents with expressive or eugenic potential. Examiners, however, are persons with technical skills and not necessarily ethical training. They would be ill-equipped to grapple with the ethical assessments that these applications may present. The PTO could establish an ethics board to deal with these issues or other morally questionable inventions. While not a panacea, examiners could flag inventions that raise expressive potential, which could be reviewed by such a board. The board, to avoid the appearance of bias, could be formed of persons not employed by the PTO directly.

Of course, ironically, in trying to assess any potential expressive impact from a given patent, the PTO would be memorializing and in fact confirming an expressive consideration of patent law. The PTO would be saying "yes, we view this as lacking utility or having utility" with consideration for expressive harms. This solution could prove to be worse than the problem.

The courts could also reinvigorate the now-moribund morality exclusion, and allow for consideration of expressive harms. The courts, however, may not be in the best position to make such assessments. Indeed, given that the groups who are likely harmed by some patents would likely never be infringers themselves, obtaining standing to challenge such patents would be a problem.

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213. Dan L. Burk, 43 HOUS. L. REV. 561, 586 (2006).

*D. Define “Utility” as Covering Genes and Biological Processes Relating to Pathological Conditions—Patents for Therapy, not Enhancement*

A cleaner, morally neutral approach is necessary for there to be a change in the utility standard, either pursuant to Congress or the PTO. An invention relating to human biology would have utility only if it served to identify or correct a truly pathological condition. While marginally “pathological” conditions could create some difficulty, such conditions could be tied to the medical profession’s views of what is viewed as disease or pathology. Moral considerations would be minimized, and those inventions that relate more to behavior and/or identity would be excluded from patent protection.

A potential source for identifying what constitutes “pathological” would be the medical community. Psychiatrists and psychologists, for example, use the Diagnostic and Statistical Manual of Mental Disorders (DSM) in assessing whether a patient has a pathological mental health condition.<sup>214</sup> Thus, the DSM acts as a catalog of conditions that are viewed as pathological, and those that are not. Thus, the field of medicine, and particularly the DSM, would be a helpful tool in assessing whether a condition is pathological and therefore should be eligible for patent protection. This approach could also be articulated as the “therapy versus enhancement” approach—protection will be provided for those genetic and biological inventions that relate to therapies for diseases but not for mere enhancements.<sup>215</sup>

There are also problems with this approach. The line between therapy/pathology and enhancement is far from clear. The DSM itself has proven to be a fluid reference—it has changed over time, and conditions within it continually change. For example, the DSM lists attention deficit-hyperactivity disorder (ADHD) as a disease and prescribes the use of drugs to treat this condition.<sup>216</sup> But this pathology is recognized only by its symptoms, which are arguably simply the tail end of a normal distribution of attention levels of children.<sup>217</sup> Arguably, this is not a case of using

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214. See FUKUYAMA, *supra* note 16, at 47; Allen, *supra* note 35, at 244 (noting that the DSM is “the psychiatric profession’s handbook of recognized pathological behaviors”). The DSM is currently in its 4th edition, and is referred to as the DSM-IV.

215. FUKUYAMA, *supra* note 16, at 208–09; see also Markwood, *supra* note 25, at 478–82 (discussing regulation of enhancement technologies); Glenn McGee, *Parenting in an Era of Genetics*, 27 HASTINGS CENTER REPORT 16, 16 (1997) (discussing distinction between therapy and enhancement).

216. FUKUYAMA, *supra* note 16, at 47.

217. *Id.* at 47.

drugs to cure a pathology—a therapy—but instead to enhance the attention level of individuals.<sup>218</sup>

What constitutes pathology is often infected by social and cultural norms, not simply medical knowledge. The most obvious example is homosexuality itself. As discussed above, until the early 1970s, the medical community, with considerable internal debate, did consider homosexuality to be pathological. Nothing changed in the 1970s with respect to homosexuality—instead social norms and views of homosexuals changed within the medical community, resulting in it being eliminated as a pathological condition.<sup>219</sup> The contextual nature of psychological disorders, therefore, may result in an ever-moving target of what constitutes pathological.

The medical line of therapy/enhancement could truly break down in the context of the deaf, dwarfs, and high-functioning autistics. The deaf do not view themselves as medically pathological, although the hearing community would view them as lacking one of the key human senses and, thus, possessing a pathological condition. The medical community would seem to be more in line with that of the hearing community, risking that the use of a medical norm would allow patents that arguably would express disfavor to the deaf community.<sup>220</sup> A similar argument could be made for dwarfs, who have bodies that function entirely normally. They are simply statistically far outside the normal range of human height. High-functioning autistics can view themselves as simply having different social skills, which is not inherently wrong. Arguably, this should not be viewed as a pathological condition, but likely the medical community would disagree.

Simply because these distinctions are difficult to make, however, does not inevitably mean that we should allow everything to be patented. Regulatory agencies other than the PTO are charged with making this distinction already.<sup>221</sup> The PTO could require the demonstration of a utility that is beyond mere enhancement and one that instead is a therapy directed to a known pathology. The DSM could remain an effective tool, however. While on the margins some conditions may seem close to the line of pathology, there are some conditions that universally would be viewed as

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218. *Id.* at 49 (“To classify people in this situation as suffering from a pathology is therefore to blur the line between therapy and enhancement. Yet this is exactly the demand that proponents of the medicalization of ADHD have made.”).

219. *Id.* at 209.

220. See Robert A. Crouch, *Letting the Deaf Be Deaf: Reconsidering the Use of Cochlear Implants in Prelingually Deaf Children*, 27 HASTINGS CENTER REPORT 14, 15–17 (1997).

221. *Id.* at 210–11.

pathological, such as schizophrenia and bipolar disorder. The DSM would at least provide certainty for certain behaviors.

Currently there is no legal basis for limiting the pathological/enhancement distinction to gene-related, biological-related, or behaviorally-related inventions. Indeed, under international obligations, countries must not discriminate on the basis of technological area, other than the exceptions provided for in TRIPS.<sup>222</sup> Consequently, the redefinition of utility would apply in other contexts, including to basic pharmaceuticals. Drugs like Viagra or Claritin might not be eligible for patent protection under the therapy/enhancement dichotomy. Whether this possibility is good or bad as a policy matter, however, bears further exploration.

The pharmaceutical industry has come under criticism recently for failing to devote sufficient resources to particularly relevant drugs, instead focusing on the next generation of market-driven (as opposed to health-care driven) drugs, such as antihistamines. A recent study has shown that most new drugs entering the market are not particularly innovative and instead are simply follow-up improvements on already existing drugs.<sup>223</sup> There are a number of reasons for this reality: the dependency of drug companies on blockbuster drugs;<sup>224</sup> the ability of companies to extend patent protection effectively on blockbusters through patent and FDA laws and regulations;<sup>225</sup> and the reduced cost of relying on known drugs in proving safety and efficacy.<sup>226</sup> Innovation in the pharmaceutical market thus seems anchored to existing drugs, many of which are more driven toward enhancement as opposed to curing pathologies.

A new utility standard, therefore, would reduce incentives for companies to spend money on “lifestyle” drugs and instead create greater incentive for pharmaceuticals and other companies to research drugs and biologics directed to more severe conditions. With availability of patents curtailed, companies would not have the patent rights to recoup their sunk research and development costs. The *ex ante* incentive to research drugs that deal with lifestyle would therefore be dramatically reduced, affording the opportunity for drug companies to shift greater resources to finding cures for truly pathological conditions. Less money would be spent on the

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222. Agreement on Trade-Related Aspects of Intellectual Property, art. 27(1) (1995).

223. MICHIE HUNT, NAT'L INST. FOR HEALTH CARE MGMT. RES. & EDUC. FOUND., CHANGING PATTERNS OF PHARMACEUTICAL INNOVATION 3 (2002).

224. *Id.* at 16.

225. *Id.* at 16–18.

226. *Id.* at 16.

next generation of Viagra and hopefully more would be spent trying to find vaccines for AIDS.<sup>227</sup> While this approach is not without its problems, it does have the promise of providing a more objective way of avoiding the harms presented in this paper. It can be viewed as the “least worst” option, but one worth considering.

## V. CONCLUSION

This Article has demonstrated the real potential for expressive harms to marginalized biologically defined groups, where the patent communicates that these biological conditions are in fact pathological instead of merely a form of diversity within the human race. There are a variety of options presented to deal with this concern, but all of them have their advantages and difficulties. None perfectly solves the problem. At a minimum, this Article calls for a reconsideration of what we mean by “useful” in patent law.

In fact, the ultimate utility that we may be protecting is that of choice—allowing persons to determine how best to use these technologies. But falling back on choice does not answer the question of why the government should be involved in granting patent rights for these discoveries. Choice alone as purely “good” is quite debatable in the context of privatized eugenics, which the patent system is poised to incentivize.<sup>228</sup> The right to choose may accompany a considerable cost—elimination of groups considered outside the norm.<sup>229</sup> While the regulation of this choice undeniably lies outside of the patent system,<sup>230</sup> that system need not embrace destructive choices by allocating a given technology as

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227. Given the markets for such “lifestyle” drugs, however, it seems unlikely that all research into these areas would completely dry up without patent protection.

228. FUKUYAMA, *supra* note 16, at 99–100 (“[W]e should be skeptical of libertarian arguments that say that as long as eugenic choices are being made by individuals rather than by states, we needn’t worry about possible bad consequences. Free markets work well much of the time, but there are also market failures that require government intervention to correct. Negative externalities do not simply take care of themselves.”); HAMER & COPELAND, LIVING, *supra* note 15, at 302 (“How will we distinguish ‘good’ genes from ‘bad’? What traits will be valued and what will be discarded? Who gets to choose?”).

229. Of course, the ultimate result of genetic research could be that everyone has some sort of genetic predisposition, so that “the ‘normal’ population may be reduced to the point at which genetic discrimination becomes unfeasible.” Dreyfuss & Nelkin, *supra* note 15, at 337. There may remain certain traits, particularly those close to identity, that may be given greater weight over others that do not implicate personhood concerns.

230. See Dresser, *supra* note 160, at 424 (recognizing that “fears expressed about animal patenting fail to apply to patenting alone; instead, they bear on the broader issue of whether scientists should be permitted to manipulate higher animal life at all” and addressing possible regulations without the patent system).

“useful” regardless of the harm that invention might inflict. The government should not be facilitating such activities with the patent system.

The patent system is one of incentives—if an inventor will engage in research resulting in a patentable invention, she is rewarded with the patent’s period of exclusivity, which allows the inventor to recoup her sunk costs and prevents free-riding by competitors. There is no doubt that denying patents in this area will not stop research into such technologies—other public measures would be required.<sup>231</sup> Eliminating, or modifying the availability of, patent rights in these areas would at least help to mitigate these commercial interests and make such innovations less desirable. Regardless, though, do we really want the patent system—with the approbation of a government-granted right—to incentivize the creation of inventions with such powerful expressive harms and enormous eugenic potential? Simply because denying patent protection will not stop these technologies does not mean that we should, therefore, continue to grant these patents and create incentives for harmful and potentially destructive discoveries.<sup>232</sup>

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231. Others have already called for public regulation on biotechnology. See FUKUYAMA, *supra* note 16, at 10, 182 (2002). There may be reason to doubt, of course, whether such regulation would limit the use of tests to assess homosexuality. See Schüklenk, *supra* note 195 (“Indeed, why should we assume that legislators in homophobic societies would regulate the use of such devices in the first place?”).

232. Cf. FUKUYAMA, *supra* note 16, at 11 (“The fact that there are some individuals or organizations that violate these rules, or that there are countries, where the rules are either nonexistent or poorly enforced, is no excuse for not making the rules in the first place. People get away with robbery and murder, after all, which is not a reason to legalize theft and homicide.”).