

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 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 towards 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 scientific status of homosexuality and then explores whether patents regarding sexual orientation could a moral signal of inferiority by the government by suggesting 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?*¹

I. INTRODUCTION

Patents traditionally have been justified on the basis of incentives. Commentators have justified patent law on three different incentive systems: *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.² On the most basic level, the patent disclosure communicates a message to the public about what the inventor has discovered and how to make and use that discovery.³ According to the *ex ante* incentive view, patents are needed to combat the public good problem of information: without patents, competitors could free ride on the invention and compete with the innovator without incurring the research and development costs.⁴ 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.⁵ By defining the property right

¹ Abraham L. Wolbarst, *Sexual perversions: their medical and social implications*, 134 *MEDICAL J. AND RECORD* 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 (ed. Vernon A. Rosario) (1997)).

² See Timothy R. Holbrook, *Possession in Patent Law*, 59 *SMU L. REV.* --- (forthcoming 2006).

³ 35 U.S.C. § 112 (2005). For a general discussion of disclosure obligations, and various structural flaws in the system that mitigate the patent system's ability to serve as a source of technical information, see Holbrook, *supra* 2, at ---.

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 ---.

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

surrounding the invention, the inventor can best coordinate later commercialization of the good in a way akin to prospecting of mineral rights.⁶

Recent scholarship has persuasively challenged these paradigmatic views and has demonstrated that patents perform functions far different than providing 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 patent portfolio can send a signal to the market about the nature of a firm's innovation capacity or other factors relevant to potential investors.⁷ The patent thus acts as an intermediary, translating otherwise complicated information into a simpler form 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.⁸ Patents consequently serve a far greater communicative effect than simply communicating 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.⁹ The need for notice of property rights among parties necessitates that there be a common language of communication and expression of who owns the rights and what

⁶ *Id.*

⁷ See R. Polk Wagner and Gideon Parchomovsky, *Patent Portfolios*, U. PENN. L. REV. 1 (2005); Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625 (2002).

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*].

those rights are.¹⁰ Property rights are more than simply the ability to exclude others. The messages and signals are necessary elements of any functioning property system.

Patents therefore undeniably act in ways to facilitate signals and communication beyond there simple disclosure. A patent differs from other forms of property in a significant way: they are granted by the US government after a substantive review of an application for the right to exclude. An inventor must demonstrate that she has satisfied the patentability requirements¹¹ 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 signals of the patent document. The government's imprimatur help convey the signal with greater clarity and confidence. The patent has credibility behind it because of the government's imprimatur.¹²

There is no reason that these signals are limited to technical and pecuniary considerations. The message in the patent also can involve the contents of the invention contained within it. The government imprimatur attending the patent grant can confirm the legitimacy of a technology.¹³ In particular, the genetic revolution has resulted in discoveries linking genes, proteins, and other biological processes to human behavior generally.¹⁴ Research

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

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, 102, 103. The inventor's application also must adequately disclose the invention. 35 U.S.C. § 112.

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

¹³ Lee, *supra* note 12, at 676.

¹⁴ DEAN HAMER & PETER COPELAND, *LIVING WITH OUR GENES* 301 (1998) ("What often goes unsaid is that 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.") [hereinafter HAMER & COPELAND, *LIVING*];

into biological causes of behaviors is inevitable and, indeed, has already begun.¹⁵ Recent discoveries include genes that influence aggressiveness,¹⁶ weight,¹⁷ intelligence,¹⁸ novelty seeking, worry¹⁹ and harm avoidance.²⁰ One scientist has noted that “[t]he real breakthroughs in understanding personality are not occurring on leather couches but in laboratories.”²¹ Another has suggested that “[t]he genetic analysis of behavior will prove to be . . . the most important advance in the behavioral sciences in [his] lifetime.”²² Many of these discoveries are patentable.

While 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.²³ These discoveries may result in the ability to manipulate or choose preferential traits, a form of privatized eugenics.²⁴ The PTO inevitably will be grant patents on biological

Rochelle Cooper Dreyfuss & Dorothy Nelkin, *The Jurisprudence of Genetics*, 45 VAND. L. REV. 313, 320 (1992).

¹⁵ FRANCES 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) (“The discovery of a genetic link to homosexuality is bound to be followed by discoveries of links to other aspects of personality.”) [hereinafter HAMER & COPELAND, DESIRE].

¹⁶ See, e.g., U.S. Pat. No. 5,418,162; U.S. Pat. No. 6,165,716.

¹⁷ HAMER & COPELAND, LIVING, *supra* note 14, at 9.

¹⁸ *Id.* at 10.

¹⁹ *Id.* at 11.

²⁰ *Id.* at 55.

²¹ *Id.* at 25.

²² RICHARD C. PILLARD, *The Search for a Genetic Influence on Sexual Orientation*, in SCIENCE AND HOMOSEXUALITIES 226, 237 (ed. Vernon A. Rosario) (1997).

²³ Admittedly, what constitutes a “disease” is infected with the public’s view of undesirability. SIMON LEVAY, QUEER SCIENCE 213-14 (1996) (“[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.”) [hereinafter LEVAY, QUEER SCIENCE].

²⁴ 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).

discoveries with such eugenic potential. This begs the question of whether we want the patent system to create an incentive for these types of discoveries.

Moreover, the imprimatur of the patent grant can express the view that such technologies are legitimate and normatively good. 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.

Such expressive dimension of intellectual property has been explored previously in trademark law²⁵ but not in patent law. The Lanham Act proscribes granting federal trademark registration for a mark that is immoral or scandalous.²⁶ 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. The only reason for denying the trademark registration in this context, therefore, is

²⁵ 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.

²⁶ 15 U.S.C. § 1052(a).

the potential that the government would be viewed as approving of such a scandalous mark.²⁷

The concern of the government sending the wrong message is purely an expressive consideration.²⁸

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 language minority. Similar concerns have been expressed others, such as high-functioning autistics and little people. Patents

²⁷ 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 1216, 1220 n.4 (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 4744 Before the Subcomm. on Trademarks of the House Comm. on Patents, 76th Cong., 1st Sess. 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 marks use. Thus, the only conceivable basis is to avoid giving the “stamp of approval” of an immoral or scandalous through the granting of a federal right. *Cf.* GRAEME B. DINWOODIE AND MARK D. JANIS, TRADEMARKS & UNFAIR COMPETITION LAW & POLICY at 331 (2004).

²⁸ 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 MARQUETTE INTELLECTUAL PROPERTY L. REV. 187, 191 (2005).

on discoveries related to such conditions would communicate the message that “curing”²⁹ these people would be normatively good, further marginalizing these groups.

A particular group whose trait is increasingly shown to be biologically related has already borne the brunt 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.³⁰ A likely result of such research into the origins of sexual orientation would be methods to “cure” gays and lesbians.³¹ An even more likely scenario would be a pre-natal screen that would identify the likelihood that the fetus will be gay, permitting termination of the pregnancy³² or perhaps consumption of some sort of pill to reduce the likelihood of bearing a gay child.³³

As such, the quest to find the “gay gene” or other biological origins of homosexuality has potential for the patent to express moral condemnation of gays and lesbians. Although a patent

²⁹ 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.

³⁰ See, e.g., Brian S. Mustanski, et. al., *A genomewide scan of male sexual orientation*, 116 HUM. GENETICS 272, 272-73 (2005).

³¹ 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 34, at 35, 40-42.

³² *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.”); ROSARD, *supra* note 48, 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, *SEXUAL BRAIN*, *supra* note 67, 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.”).

³³ FUKUYAMA, *supra* note 15, at 39-40.

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 such a discovery.³⁴

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.³⁵

³⁴ Dean Hamer has stated that he plans to use the rights to exclude others from using the discovery in a way harmful to others. DEAN HAMER & PETER COPELAND, *LIVING WITH OUR GENES* 219 (1998) (“I would 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* 227 (ed. Vernon A. Rosario) (1997) (“[Hamer] also vowed to patent his genetic testing techniques to insure that they could not be used in a discriminatory way.”).

³⁵ Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation: The Anticommons in Biomedical Research*, 280 *SCIENCE* 698 (May 1998); Jordan Paradise, Lori Andrews, and Timothy Holbrook, *Patents on Human Genes—An Analysis of Scope and Claims*, 307 *SCIENCE* 1566 (March 11, 2005); Bagley, *supra* note 12; Jonathan Kahn, *What’s the Use? Law and Authority in Patenting Human Genetic Material*, 14 *STAN. L. & POL. R.* 417, 423 (2003); 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); MARGARET DAVIES AND NGAIRE NAFFINE, *ARE PERSONS PROPERTY?* 155-56 (2002) 56 (“Indigenous people and third-world

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.

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.³⁶ As recently as 1974, homosexuality was viewed as a psychological pathology in need of treatment.

More recently, however, gays and lesbians have obtained greater acceptance socially and legally. 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.³⁷ Legally, states and localities are affording gays and lesbians far more

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.'"); 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).

These previous 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 that group 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.

³⁶ See Julian W. Slowinski, *Therapeutic Dilemmas: Solving Sexual Difficulties in the Context of Religion*, 26 J. OF SEX ED. AND THERAPY 272, 278 (2001).

³⁷ ROBERT ALAN BROOKEY, *REINVENTING THE MALE HOMOSEXUAL: THE RHETORIC AND POWER OF THE GAY GENE* 37 (2002); HUBERT KENNEDY, *Karl Heinrich Ulrichs: First Theorist*

legal protections than in the past. 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.³⁸ Massachusetts legalized same-sex marriage itself.³⁹ Even the U.S. Supreme Court's view of gays and lesbians has shifted dramatically.⁴⁰ The expressive dimension to these decisions is expressly noted in the opinions.⁴¹

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."⁴² Members of Congress have proposed a constitutional amendment to prohibit state and local governments from affording marriage rights to same-sex couples.⁴³ 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

of Homosexuality, in SCIENCE AND HOMOSEXUALITIES 26, 39 (ed. Vernon A. Rosario) (1997); LEVAY, QUEER SCIENCE, *supra* note 23, at 211.

³⁸ Baker v. Vermont, 170 Vt. 194 (1999); Connecticut began recognizing civil unions on October 1, 2005. See William Yardley, *Connecticut Approves Civil Unions for Gays*, N.Y. TIMES at B5 (April 21, 2005).

³⁹ Goodridge v. Dep't of Pub. Health, 440 Mass. 309 (2003).

⁴⁰ 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 found 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.

⁴¹ *Lawrence*, 539 U.S. at 575 ("[*Bowers*] continuance as precedent demeans the lives of homosexual persons."); *Romer*, 517 U.S. at 635 (The Colorado amendment "classifie[d] homosexuals not to further a proper legislative end but to make them unequal to everyone else.").

⁴² 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) (last visited March 2, 2005). The

⁴³ See, e.g., See Jan Crawford Greenburg, *Gay marriage ban rejected*, CHICAGO TRIBUNE, Nov. 19, 2003, at 1; Evelyn Nieves, *Family Values Groups Gear Up For Battle Over Gay Marriage*, WASHINGTON POST, Aug. 17, 2003, at A6, also available in 2003 WL 5651316.

homosexuality is not a choice. 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 biological⁴⁴ cause of homosexuality. Sexual orientation, even biologically speaking, is a complex characteristic; finding *a single* cause is highly unlikely.⁴⁵ Sexual orientation is most likely influenced by a number of biological factors.⁴⁶ Overall, a person likely possesses biologically determined disposition toward a certain sexual orientation, which is resistant to alteration.⁴⁷

This section 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.⁴⁸ Four categories of studies have demonstrated

⁴⁴ 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.

⁴⁵ HAMER & COPELAND, LIVING, *supra* note 14, 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*, CHICAGO TRIBUNE, 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 pathway.” (quoting Feino F. L. Meyer-Bahlburg, a Columbia University professor of clinical psychology)).

⁴⁶ Mustanski, *supra* note 30, at 273 (“Given the complexity of sexual orientation, numerous genes are likely to be involved. . . .”); PILLARD, *supra* note 22, at 230.

⁴⁷ *Id.* at 233.

⁴⁸ 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 (ed. Vernon A. Rosario)

this influence: twin studies, physical differences in the brain, the identification of the location of a potential gay gene, and the birth-order phenomenon.⁴⁹

A. Twin Studies Demonstrate Genetic Influence on Sexual Orientation

The classic method for assessing the genetic influence on a trait is to study monozygotic, or identical, twins separated at birth. Because these siblings have an identical genetic makeup but do not share the same environment, such studies can mitigate the impact of environmental influences on the expression of a given trait.⁵⁰ For sexual orientation studies, however, such data are not readily available.⁵¹ Instead the studies have focused on the differences between monozygotic (identical) twins, dizygotic (fraternal) twins, and siblings.⁵² If a trait is genetically linked, then monozygotic twins will more likely share the trait, whereas dizygotic twins will possess the trait at the same ratio as a non-twin sibling.⁵³ and. If the trait is influenced by intrauterine factors, then dizygotic twins will share the trait more frequently than non-twin siblings.⁵⁴

(1997)). Thus, I eschew the geneticist definition, focusing on potential biological sources of homosexuality. *See supra* note 44.

⁴⁹ 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 BEHAVIOR 1, 14 (2000); Domonick J. Wegesin, *A Neuropsychologic Profile of Homosexual and Heterosexual Men and Women*, 27 ARCHIVES OF SEXUAL BEHAVIOR 91, 92 (1998).

⁵⁰ *See* BELLS AND HUFFORD, *supra* note 42, at 29; LEVAY, QUEER SCIENCE, *supra* note 23, at 177; LEVAY, QUEER SCIENCE, *supra* note 23, at 177.

⁵¹ Gay identical twins that have been reared separately have been studied, but the numbers are too small to have any statistical significant. *Id.* at 178.

⁵² *Id.* 25-30.

⁵³ PILLARD, *supra* note 22, at 234. Adoptive siblings will share the trait at same rate as the population as a whole. *Id.*

⁵⁴ *Id.* at 234.

Numerous twin studies have been performed with respect to homosexuality.⁵⁵ Some of the earliest studies evaluating the inheritability of homosexuality involved the use of twins.⁵⁶ The study performed by J. Michael Bailey and Richard Pillard found that in 52% of the cases, if one monozygotic twin was gay, then the other also was.⁵⁷ The rates for fraternal twin brothers was 22%.⁵⁸ The concordance rate for adopted brothers was only 11%.⁵⁹ Thus, while not entirely determined by genetics,⁶⁰ homosexuality does have a strong genetic component. A concordance rate of less than 100% does not mean there is no genetic component to homosexuality or that homosexuality arises strictly due to environmental forces.⁶¹ For other anatomical and biochemical conditions, concordance rates can be less than 100% due to other biological mechanisms coming into play.⁶² The gay gene may simply be inactive in the unaffected sibling.⁶³ Numerous other twin studies have performed that confirm a genetic influence.⁶⁴ Regardless, “[t]here is no room for doubt that homosexuality is highly heritable.”⁶⁵

⁵⁵ See MATT RIDLEY, *GENOME* 117 (1999) (“A dozen other studies came to a similar conclusion [that a gene or genes contribute to homosexuality].”); LEVAY, *QUEER SCIENCE*, *supra* note 23, at 173-78.

⁵⁶ BELLS AND HUFFORD, *supra* note 42, at 26.

⁵⁷ J. Michael Bailey and Richard Pillard, *A Genetic Study of Male Sexual Orientation*, 48 *ARCHIVES OF GENERAL PSYCHIATRY* 1092 (1991).

⁵⁸ *Id.*

⁵⁹ ALLEN *supra* note 34, at 252.

⁶⁰ An exclusively genetic trait would have a concordance rate of 100%. BELLS AND HUFFORD, *supra* note 42, at 26.

⁶¹ See William J. Turner, *Homosexuality, Type 1: An Xq28 Phenomenon*, 24 *ARCHIVES OF SEXUAL BEHAVIOR* 109, 125-26 (1995).

⁶² *Id.*; HAMER & COPELAND, *LIVING*, *supra* note 14, at 188. Studies suggest, however, that shared parental environment has almost no impact on sexual orientation. HAMER & COPELAND, *LIVING*, *supra* note 14, at 188 (“In the most careful twin study to date, the best mathematical estimate for the shared environmental component of variance was 0 percent.”).

⁶³ Turner, *supra* note 61, at 126.

⁶⁴ See Mustanski, *supra* note 30, at 273; BELLS AND HUFFORD, *supra* note 42, at 27-28; LEVAY, *QUEER SCIENCE*, *supra* note 23, at 175-77.

⁶⁵ RIDLEY, *supra* note 55, at 117; *see also* LEVAY, *QUEER SCIENCE*, *supra* note 23, at 177.

B. *The Gay Brain – Variations in the Hypothalamus*

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 is strongly rooted there. Of particular importance is the hypothalamus, the part of the brain from which sexual desire originates.⁶⁶ Researcher Simon LeVay discovered that the size of the hypothalamus differs between homosexual heterosexual men.⁶⁷ Prior research showed that the hypothalamus of men and women differ in size in a statistically significant way.⁶⁸ In LeVay's study, he found that, on average, the gay men's hypothalamus were two to three times smaller than heterosexual men's and were the same size as women's.⁶⁹ Such a finding suggests that the neuronal mechanisms in the brain that regulate sexual behavior may differ physically between gay and straight men.⁷⁰ This result is consistent with studies on cognitive differences between gays and straights⁷¹ and with studies done on animals demonstrating same-sex attraction.⁷² Subsequent studies also have shown variations in

⁶⁶ See STEVEN PINKER, *THE BLANK SLATE: THE MODERN DENIAL OF HUMAN NATURE* 89 (2002).

⁶⁷ SIMON LEVAY, *THE SEXUAL BRAIN* 120 (1993) [hereinafter LEVAY, *SEXUAL BRAIN*].

⁶⁸ LEVAY, *SEXUAL BRAIN*, *supra* note 67, at 120. The hypothalamus is a tiny region at the base of the brain. LEVAY, *QUEER SCIENCE*, *supra* note 23, at 130. LeVay specifically studied the INAH 3 region, which is sexually dimorphic. LEVAY, *SEXUAL BRAIN*, *supra* note 67, at 120. For convenience, I will refer generally to the hypothalamus.

⁶⁹ LEVAY, *SEXUAL BRAIN*, *supra* note 67, at 121; LEVAY, *QUEER SCIENCE*, *supra* note 23, at 143.

⁷⁰ LEVAY, *SEXUAL BRAIN*, *supra* note 67, 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.*

⁷¹ Wegesin, *supra* note 49, at 94.

⁷² LEVAY, *QUEER SCIENCE*, *supra* note 23, 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* 60-61 (June 12, 1995) (homosexuality in fruit flies). Homosexual conduct is "widely distributed in the

the brain structures of gays and straights.⁷³ These differences in brain structure could be a result genetic or hormonal influence on the development of the brain.

There is a “chicken-and-egg” problem to these studies. 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.⁷⁴ So, these results beg the question of whether the brain differences influenced sexual orientation or whether sexual orientation influenced the changes in the brain.⁷⁵ Regardless, there is considerable scientific evidence that the physical structure of the brain plays a significant role in sexual orientation.

C. The “Gay Gene” Marker

One possibility for the physical differences between gay and straight brains is that a gene or genes could influence development of the brain. If there is such a genetic link, then homosexuality should run in families.⁷⁶ In fact, it does – both gay men and lesbians have a

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*, CHICAGO TRIBUNE, Nov. 13, 2003, at 22.

⁷³ Miller, *supra* note 49, at 13. In a study of the reaction to 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*, PROCEEDINGS OF THE NAT’L ACAD. OF SCIENCES 7356, 7356 (May 17, 2005).

⁷⁴ See, e.g., BELLS AND HUFFORD, *supra* note 42, at 36; LEVAY, *QUEER SCIENCE*, *supra* note 23, at 144 ([T]here is always at least the theoretical possibility that the structural differences are actually the *result* of differences in sexual behavior.” (emphasis in original)).

⁷⁵ See Savic et al., *supra* note 73, at 7361 (noting causation of hormone response could be hypothalamus differentiation, acquired sensitization through stimuli, or association with scent to sex); ROSARIO, *supra* note 48, 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*”); LEVAY, *SEXUAL BRAIN*, *supra* note 67, at 122.

⁷⁶ PILLARD, *supra* note 22, at 233.

greater likelihood having gay or lesbian siblings.⁷⁷ 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.⁷⁸ 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. Recognizing the likelihood that homosexuality could be a sex-linked trait, Hamer performed a linkage study on his subjects⁷⁹ and found a statistically significant link between a known marker, Xq28, and the trait of male homosexuality.⁸⁰ The study concluded that the “linkage results [were] statistically significant at a confidence level of >99 percent.”⁸¹

⁷⁷ *Id.* at 227; Sven Bocklandt, et. al., *Extreme skewing of X chromosome inactivation in mothers of homosexual men*, 118 *HUM. GENETICS* 691, 691 (2006); Mustanski, *supra* note 30, at 273.

⁷⁸ HAMER & COPELAND, *LIVING*, *supra* note 14, at 190; HAMER & COPELAND, *DESIRE*, *supra* note 15, at 93-94.

⁷⁹ HAMER & COPELAND, *DESIRE*, *supra* note 15, at 120-133. 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 22, 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 fragment that are known on a given chromosome. These markers act as road signs because, on a single chromosome, genes generally stay together because chromosomes generally do not split themselves into pieces during meiotic cell division. Genes located on the same chromosome are generally inherited together. 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, then the trait – homosexuality – may have a genetic component located near that marker. *See generally* HAMER & COPELAND, *DESIRE*, *supra* note 15, at 113.

⁸⁰ HAMER & COPELAND, *DESIRE*, *supra* note 15, at 121. By chance, brothers would normally have a 50% chance of sharing the markers; Hamer found that 83% of the gay brothers

Although some have disputed this linkage,⁸² Hamer subsequently confirmed his results.⁸³ Other studies have also suggested a genetic influence arising from the X chromosome.⁸⁴ 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.⁸⁵ 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 Congenital Cause

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

had matching variants, while the control of random pairs of brothers satisfied the expected 50% rate. ALLEN, *supra* note 34, at 253.

⁸¹ Dean H. Hamer et al., *A Linkage Between DNA Markers on the X Chromosome and Male Sexual Orientation*, 261 SCIENCE 321 (July 16, 1993) (as reprinted in HAMER & COPELAND, DESIRE, *supra* note 15, 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.

⁸² A group of researchers at the University of Western Ontario failed to find any markers linked to homosexuality. LEVAY, QUEER SCIENCE, *supra* note 23, at 184-85. Importantly, these results were not published in a peer-reviewed journal. Mustanski, *supra* note 30, 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 14, at 197.

⁸³ BELLS AND HUFFORD, *supra* note 42, at 25; LEVAY, QUEER SCIENCE, *supra* note 23, at 183-84; Mustanski, *supra* note 30, at 273.

⁸⁴ Turner, *supra* note 61, 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 favoring male homosexuality and promoting female fecundity*, PROCEEDINGS OF THE ROYAL SOCIETY B: BIOLOGICAL SCIENCES 04PB0377.1, 04PB0377.3 (published on-line 2004); *see also Study links genes, male homosexuality*, www.cnn.com (Oct. 13, 2004) (“The key factor is that these genes both influence homosexuality in men, higher fecundity in females and are in the maternal and not the paternal line.” (quoting Andrea Camperio-Ciani)) (available at www.cnn.com/2004/tech/science/10/13/homosexuality.study.reut/ndex.html) (last visited Oct. 19, 2004).

⁸⁵ Mustanski, *supra* note 30, at 276.

has, the increased likelihood that the subsequent son will be gay.⁸⁶ So, younger brothers are more likely to be gay than their older brothers. Interestingly, the presence of sisters is irrelevant, resulting in a fraternal birth order effect.⁸⁷ 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,⁸⁸ and the phenomenon has been documented not only in the United States but also in Britain, the Netherlands, and Canada.⁸⁹

Scientists have yet to demonstrate the process resulting in the birth-order effect, although they have posited various theories. Hormone levels, or the fetuses susceptibility to hormones, could influence sexual orientation.⁹⁰ A woman could build up a “resistance” to the male fetus, creating more female hormones.⁹¹ These hormones may interfere with the determination of the cells and brain structures that result in a heterosexual child.⁹² If the hormones act to prevent masculinization of the developing fetus – or allow effeminization – the result could be changes

⁸⁶ See David W. Purcell et al., *Birth Order in a Contemporary Sample of Gay Men*, 29 ARCHIVES OF SEXUAL BEHAVIOR 349, 352-53 (2000); RIDLEY, *supra* note 55, at 118 (“A man with one or more elder brothers is more likely to be gay than a man with no siblings, only younger siblings, or with one or more elder sisters.”); Ray Blanchard and Anthony F. Bogaert, *Birth Order in Homosexual v. Heterosexual Sex Offenders Against Children, Pubescents, and Adults*, 27 ARCHIVES OF SEXUAL BEHAVIOR 595, 595-96 (1998).

⁸⁷ Purcell, *supra* note 86, at 350; RIDLEY, *supra* note 55, at 118.

⁸⁸ RIDLEY, *supra* note 55, at 118.

⁸⁹ *Id.*

⁹⁰ FUKUYAMA, *supra* note 15, at 37.

⁹¹ Purcell et al., *supra* note 86, at 354; Blanchard and Bogaert, *supra* note 87, at 602 (both 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.”).

⁹² Blanchard and Bogaert, *supra* note 87, 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 55, 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 55, at 119.

in the sexual differentiation of the brain.⁹³ Finally, there could be a genetic component as well, such as genes that influence how the fetus interacts with the intrauterine hormones.⁹⁴

All of these biological investigations demonstrate that sexual orientation is influenced by biological mechanisms. Patents on these discoveries therefore are highly likely, if not inevitable.

III. THE POTENTIAL FOR EXPRESSIVE HARMS FROM PATENTS

Important with respect to all of these investigations is that science is not exempt from biases.⁹⁵ The framing of their investigations reveal a subtle yet pervasive bias. 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 distinguishing homosexuality, inherently they suggest that homosexuality (or any variant from heterosexuality) is outside the norm.

Notwithstanding the seemingly pro-gay discussion, the science remains inherently hetero-centric, which has significant consequences for the potential expressive impact patents on these

⁹³ RIDLEY, *supra* note 55, at 119 (“If so, the effect of a strong immune reaction against these proteins from the mother would be partly to prevent the masculinisation of the brain, but not that of the genitals.”); Blanchard and Bogaert, *supra* note 87, at 602; LEVAY, *SEXUAL BRAIN*, *supra* note 67, at 123

⁹⁴ Miller, *supra* note 49, 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.”); LEVAY, *QUEER SCIENCE*, *supra* note 23, at 125. 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.” *Id.* 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, necessarily 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.”

⁹⁵ Dreyfuss & Nelkin, *supra* note 14, 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.”).

processes may have. These studies, however, also risk further marginalizing gays and lesbians by looking them as biologically flawed and in need of being “cured.” A similar situation is faced by other groups who may not view themselves as being pathological or in need of curing, such as the deaf, dwarfs, and high-functioning autistics. Patents related to these technologies would confirm the legitimacy of such technology through the government’s imprimatur, signaling governmental approval of efforts to cure these groups. The patent system is thus directly implicated in these technologies and 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.⁹⁶ Under this view, laws can shape or reinforce social norms and also inflict harms to members of society.⁹⁷ Indeed, it is beyond cavil that “the linguistic meaning of governmental action can have a moral impact.”⁹⁸ Laws can be examined normatively by assessing how they

⁹⁶ 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*].

⁹⁷ Mark D. Rosen, *Establishment, Expressivism, and Federalism*, 78 CHI.-KENT L. REV. 669, 670 (2003).

⁹⁸ 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 96. Both of these camps, however, recognize that government acts can have expressive impacts. See Matthew D. Adler, *Meaning, Nonlinguistic “Expression,” and the Multiple Variants of Expressivism: A Reply Response 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.

express certain intentions and attitudes.⁹⁹ Racial segregation, for example, communicates that blacks are inferior to whites and that whites must be protected against blacks.¹⁰⁰ The expressive harm occurs regardless of whether the target – here blacks – believe or accept the message; so long as they understand the message communicated, the harm arises.¹⁰¹ What is important is the “social, or symbolic, meaning” of certain laws or other acts by the state.¹⁰²

Specifically, “[e]xpressive theories of action tell us to express certain attitudes adequately, [the standard for which] is not met simply by intending to express those attitudes, or by thinking that one’s actions do express those attitudes. There need not be an intent to communicate a certain message for there to be expressive harms.^[103] Rather, the standard of adequacy is public, set by objective criteria for determining the meaning of action.”¹⁰⁴ Thus, somewhat surprisingly, the intentions of an actor are not the only factors relevant in assessing the expressive impact those acts.¹⁰⁵ The expressive harm can arise when people *understand* the message communicated, even if they may not agree with the message.¹⁰⁶

Expressive considerations help explain “why the consequences matter, and which consequences matter,” both of which are important because these impacts occur to *people*, not

⁹⁹ Rosen, *supra* note 97, at 669-70; Anderson & Pildes, *Expressive I*, *supra* note 96, at 1508.

¹⁰⁰ See, e.g., Johnson v. California, No. 03-636, 2005 WL 415281, at *5 (S. Ct. Feb. 23, 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.”); see also Anderson & Pildes, *Expressive I*, *supra* note 96, at 1528.

¹⁰¹ Anderson & Pildes, *Expressive I*, *supra* note 96, at 1528.

¹⁰² Alex Geisinger, *A Belief Change Theory of Expressive Law*, 88 IOWA L. REV. 35, 40-41 (2002).

¹⁰³ Anderson & Pildes, *Expressive I*, *supra* note 96, at 185. Anderson and Pildes note that “communicative acts are only a small subset of all expressive acts.” *Id.*

¹⁰⁴ *Id.* at 1512.

¹⁰⁵ *Id.* at 1513.

¹⁰⁶ *Id.* at 1545.

simply abstract institutions.¹⁰⁷ Any interpretation of the impact of course will depend on the context of the communication.¹⁰⁸ A person will suffer an expressive harm when “she is treated according to principles that express negative or inappropriate attitudes towards her.”¹⁰⁹ Under expressive theories, “state action should be wrong . . . when it expresses impermissible valuations, without regard to further concerns about its cultural or material consequences.”¹¹⁰

The acts of the state can thus send a signal what the norms of a society ought to be.¹¹¹ Law can impact the views of individuals about which behaviors are approved or disapproved by society as whole,¹¹² resulting in an actor understanding how others will view her behavior.¹¹³ The state can act as a collective to express certain views, even if those views differ from those of individual legislators.¹¹⁴ The legislative process also can affect attitudes expressively by revealing new information to society regarding a given subject.¹¹⁵ Indeed, there may not even have to be a law passed – simple disclosure by the government may have expressive impacts.¹¹⁶

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 characteristic such as race, ethnicity, and gender.¹¹⁷ The courts have found laws unconstitutional under the Equal Protection Clause even absent any actual, non-psychic harm: the expression of

¹⁰⁷ Anderson & Pildes, *Expressive I*, *supra* note 96, at 1513.

¹⁰⁸ *Id.* at 1525.

¹⁰⁹ *Id.* at 1527-28.

¹¹⁰ *Id.* at 1531.

¹¹¹ See Geisinger, *supra* note 102, at 43; Cass R. Sunstein, *On the Expressive Function of Law*, 144 U. PA. L. REV. 2021, 2029-44 (1996).

¹¹² Geisinger, *supra* note 102, at 45.

¹¹³ *Id.* at 47.

¹¹⁴ *Id.*

¹¹⁵ *Id.* at 64-65.

¹¹⁶ *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 an passage of an actual statute.

¹¹⁷ Anderson & Pildes, *Expressive I*, *supra* note 96, at 1533.

these views alone is sufficient.¹¹⁸ Similar outcomes are found in the Establishment Clause cases, where the court has 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.¹¹⁹ Criminal punishment, particularly incarceration, have received support from expressive theories, which suggest that fines 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.¹²⁰

Gays and lesbians have long endured laws which inflict expressive harms against them.¹²¹ Sodomy laws were used to classify homosexuals as “criminals,” even if the laws were never enforced.¹²² Until overturned by the Supreme Court, Colorado’s amendment to the state constitution that prohibited cities and municipalities from providing civil rights protection for

¹¹⁸ *Id.* at 1534; *see Johnson*, 2005 WL 415281, at *13 (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.”).

¹¹⁹ Anderson & Pildes, *Expressive I*, *supra* note 96, at 1547. Whether those “nonadherents” *actually* feel excluded is irrelevant. *Id.* What is key is the governments 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. American Civil Liberties Union Greater Pittsburgh*, 492 U.S. 573, 593-94 (1989) (citing O’Connor’s concurrence favorably).

¹²⁰ Dan M. Kahan, *What Do Alternative Sanctions Mean?* 63 U. CHI. L. REV. 591, 605-30 (1996). *But see Adler*, *supra* note 98, at 1366-68 (discussing and criticizing this theory).

¹²¹ *See generally* Andrew Koppelman, ANTIDISCRIMINATION LAW AND SOCIAL EQUALITY (1996).

¹²² *Lawrence v. Texas*, 123 S. Ct. 2472, 2484 (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 HARVARD 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.*

gays and lesbians communicated a strong message of inferiority.¹²³ 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.¹²⁴

Recent patent scholarship has shown that patents communicate information beyond technical information regarding the invention.¹²⁵ This subsection 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.¹²⁶

¹²³ 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.”).

¹²⁴ 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. Department of Public 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*, CHICAGO TRIBUNE, Nov. 18, 2003, at 30 (“Every day, you face reminders that you’re a second-class citizen.”). Cf. Anderson & Pildes, *Expressive I*, *supra* note 96, 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.”).

¹²⁵ Long, *supra* note 7; Wagner & Parchomovsky, *supra* note 7; Heald, *supra* note 7, at 476.

¹²⁶ FUKUYAMA, *supra* note 15, at 16 (“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.”).

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,¹²⁷ and discoveries in this area certainly will be the subject of future patent applications. For groups such as gays, the deaf,¹²⁸ dwarfs,¹²⁹ and high-functioning autistics, the granting of a patent risks communicating that they are inferior, flawed members of society that should be cured¹³⁰ or, potentially through prenatal testing or gene

¹²⁷ HAMER & COPELAND, *LIVING*, *supra* note 14, 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.”).

¹²⁸ Comparisons between the experience of gays and the deaf have been made previously. *See* ROSARIO, *supra* note 48, 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 object 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 22, at 238.

¹²⁹ *See id.* 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.”).

¹³⁰ FUKUYAMA, *supra* note 15, at 39 (“Scientific knowledge about causation will inevitably lead to a technological search for ways to manipulate that causality.”).

therapy, eliminated altogether.¹³¹ 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.¹³²

What is consider “normal” versus “pathological,” while arguably objective scientifically, is necessarily infected with moral and cultural values.¹³³ 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 heterosexual orientation as well as a homosexual one.¹³⁴ No matter how objective any individual method or

¹³¹ LEVAY, *QUEER SCIENCE*, *supra* note 23, at 23 (“[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.”).

¹³² Hamer states that he plans to use the rights to exclude others from using the discovery in a way harmful to others. HAMER, *supra* note 78, at 219 (“Third, I would 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 34, at 227 (“[Hamer] also vowed to patent his genetic testing techniques to insure that they could not be used in a discriminatory way.”). 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.

¹³³ *See* ROSARIO, *supra* note 48, at 4 (“[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 (ed. Vernon A. Rosario) (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 14, at 333 (noting “persons at risk” due to genetic condition as “people whose physical condition removed them from the class of normalcy”).

¹³⁴ LEVAY, *QUEER SCIENCE*, *supra* note 23, 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 23, at 5 (“What should be emphasized, though,

research may be, political and moral considerations will infect the results¹³⁵ and, consequently, impact the view a patent on such subject matter would have within the general population. Such research is inextricably linked not only with what causes homosexuality but also with what it *means* to be a homosexual.¹³⁶ The medicalization of homosexuality in the past has been used to stigmatize and marginalize homosexuals.¹³⁷ The threat to these groups of eugenic application of these technologies to eliminate them is real.¹³⁸ Eugenics conflates science with the moral.¹³⁹

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 34, 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.”).

¹³⁵ ROSARIO, *supra* note 48, at 12 (“Despite Hamer[sic, ‘s] 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.”).

¹³⁶ *Id.* at 14.

¹³⁷ MARGARET GIBSON, *Clitoral Corruption: Body Metaphors and American Doctors’ Constructions of Female Homosexuality 1870-1900*, in SCIENCE AND HOMOSEXUALITIES 108, 108 (ed. Vernon A. Rosario) (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 175 (nothing 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.”).

¹³⁸ *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, *supra* note 48, 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, *SEXUAL BRAIN*, *supra* note 67, 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.”).

¹³⁹ GIBSON, *supra* note 137, 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

Consequently, these technologies easily can be viewed not only as a threat to the human dignity of gays and lesbians but also a threat to their existence¹⁴⁰ Biological conversion technologies will undoubtedly be protected by patents, and this eugenic potential informs the potential expressive impact of granting patent rights in this area.

Investigation of factors relative to an expressive harms have 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.”¹⁴¹ The nature of law as a governmental act necessarily communicates something 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,¹⁴² and the potential for sanctions against third parties.¹⁴³ 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 section 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

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.”).

¹⁴⁰ FUKUYAMA, *supra* note 15, at 39-40. Indeed, the LeVay findings regarding the brain in fact already spurred anti-gay and lesbian groups to attempt conversion methods. LeVay, *QUEER SCIENCE*, *supra* note 23, at 134.

¹⁴¹ Richard H. McAdams, *A Focal Point Theory of Expressive Law*, 86 VA. L. REV. 1649, 1666, 1668 (2000).

¹⁴² Patents in the biotech world have garnered media attention already. *See infra* note 162 and accompanying text.

¹⁴³ *Id.* at 1668-69.

address the issue of whether any such signal may be lost in other “noise.” This expressive message is a part of the communicative ability of patents.

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.¹⁴⁴ Commentators have also noted that expressive communications could occur through regulatory agencies and even judges.¹⁴⁵ Others have suggested that mere government communications that fall short of a statute can serve a signaling function.¹⁴⁶ 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 a disclosure to the public so that the know-how underlying the invention will enter the public domain. Recent scholarship has demonstrated that patents can communicate information beyond merely the extent of the inventor’s exclusive rights. Patents can serve as economic signals to other entities about the innovative abilities and strength of a company.¹⁴⁷ They can also be used as a mechanism to reduce transaction costs between parties.¹⁴⁸ These roles for patents demonstrate that patents 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

¹⁴⁴ See, e.g., Anderson & Pildes, *Expressive I*, *supra* note 96, at 1533-64.

¹⁴⁵ McAdams, *supra* note 141, at 1678-89.

¹⁴⁶ See *supra* note 116.

¹⁴⁷ See generally Long, *supra* note 7; Wagner and Gideon Parchomovsky, *supra* note 7.

¹⁴⁸ See generally, Heald, *supra* note 7.

grants of exclusive rights from the federal government. While technically legislation, the patent grant can be viewed as akin to private legislation.¹⁴⁹

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.”¹⁵⁰ Thus, while a patent granted by an agency and 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 something beyond mere technical information, such as signal of the firm’s innovativeness. There is no reason they 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.¹⁵¹ The public looks at what is being granted because the government is giving its imprimatur on the disclosed invention.¹⁵² The patent system is in essence an incentive system by the government to encourage innovation, innovation which in some circumstances

¹⁴⁹ John R. Thomas, *Liberty and Property in the Patent Law*, 39 HOUSTON L. REV. 569, 582 (2002) (“Patents may be conceived as a sort of private legislation.”).

¹⁵⁰ *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 987 (Fed. Cir. 1995) (en banc), *aff’d* 517 U.S. 370 (1996).

¹⁵¹ *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.”).

¹⁵² *Id.* at 475-76 (acknowledging that, while banning patents on morally controversial subject matter will not halt research in those areas, “the availability of a government imprimatur granting exclusive rights over morally inventions is a separate but important issue as well”).

may be of morally questionable subject matter.¹⁵³ 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 "legitimate novel technologies and the theories that they apply."¹⁵⁴ They can "validate inventions" of questionable scientific credibility.¹⁵⁵ 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.¹⁵⁶ 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 widespread¹⁵⁷) does seem reasonable. The

¹⁵³ *Id.* at 476.

¹⁵⁴ Peter Lee, *supra* note 12, at 676.

¹⁵⁵ *Id.*

¹⁵⁶ See Mark 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 view of intellectual property as a form of property).

¹⁵⁷ 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

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 exemplifies the reality that government subsidies are laced with moral considerations.¹⁵⁸

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.”¹⁵⁹ 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.”¹⁶⁰ 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.”¹⁶¹ 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 band does remove the government-provided incentive to develop such technologies. Thus,

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.

¹⁵⁸ See Christopher Robertson, *Recent Developments in the Law and Ethics of Embryonic Research: Can Science Resolve the Ethical Problems it Creates?*, 33 J. L., MED., & ETHICS 384, 384 (2005). I personally disagree with this decision.

¹⁵⁹ H.R. 2673, Pub. L. No. 108-199; see *PTO Issues Patent on Methods for Cloning Mammals, May Run Afoul of Law*, 68 BNA'S PATENT, TRADEMARK, & COPYRIGHT JOURNAL 485, 486 (Aug. 27, 2004).

¹⁶⁰ Cong. Rec. (July 22, 2003) (comments of Rep. Weldon on H7274).

¹⁶¹ *Id.*

fears and objections to patenting humans, therefore, must be rooted in something broader – the idea that patents can express government endorsement of morally objectionable technologies.¹⁶²

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*.¹⁶³ Because the denial of a patent would not prevent these morally objectionable technologies from developing, these provisions serve only to eliminate the signaling problem. Other incentives operate to encourage scientists to develop such technologies, as can be seen in the context of cloning humans. 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 imprimatur.

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.¹⁶⁴ As such, patents could serve to communicate a message to the public, both gay and

¹⁶² 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*, 68 BNA'S PATENT, TRADEMARK, & COPYRIGHT JOURNAL 485, 486 (Aug. 27, 2004). 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 on Too-Human Hybrid*, WASH. POST, Feb. 13, 2005, at A03.

¹⁶³ TRIPS, art. 27(2).

¹⁶⁴ *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.”).

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 affects similar to that as 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.¹⁶⁵ 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.”¹⁶⁶ The inventor must demonstrate that the invention has only one use that benefits society, even if there are numerous other uses that would be detrimental. The courts and PTO generally use the utility requirement to reject inventions that belie scientific laws, such as a perpetual motion machine.¹⁶⁷ 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

¹⁶⁵ 35 U.S.C. § 101.

¹⁶⁶ Gitter, *supra* note 35, at 1662-63.

¹⁶⁷ Interestingly, the PTO used to include cures for baldness in this category.

invention must have a substantial, specific, and credible utility to be eligible for patent protection.¹⁶⁸

Historically, the utility requirement also contained a morality component: inventions viewed as immoral lacked utility per se and were ineligible for patent protection.¹⁶⁹ For example, the PTO at one time viewed patents on gambling machines as ineligible for patent protection because their only use was immoral.¹⁷⁰ Moral utility appears to be withering away.¹⁷¹ In *Juicy Whip, Inc. v. Orange Bang, Inc.*,¹⁷² 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.¹⁷³ The Federal Circuit distinguished Justice Storie’s morality-based view of utility. Noting that this principle “has not been applied broadly in recent years,”¹⁷⁴ 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.”¹⁷⁵

Consistent with this amoral approach to the 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

¹⁶⁸ See Utility Examination Guidelines, 66 Fed. Reg. 1093, 1094 (Patent and Trademark Office, Jan. 5, 2001).

¹⁶⁹ See, e.g., *Lowell v. Lewis*, 15 F. Cas. 1018 (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.”).

¹⁷⁰ See, e.g., *Brewer v. Lichtenstein*, 278 F. 512 (7th Cir.1922). The PTO now does allow patents on gambling devices. See *In re Murphy*, 200 USPQ 801 (PTO Bd. App. 1977).

¹⁷¹ But see *infra* notes 185-191 and accompanying text (exploring PTO’s reliance on morality post-*Juicy Whip*).

¹⁷² 185 F3d 1564 (Fed. Cir. 1999).

¹⁷³ *Id.* at 1366.

¹⁷⁴ *Juicy Whip*, 185 F3d at 1366-67.

¹⁷⁵ *Id.* at 1368.

of what it means to be human and no person should be able to own/control something so basic.”¹⁷⁶ The PTO reasoned that genes, as a discovery,¹⁷⁷ 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. § 112.¹⁷⁸ Because patents “do not confer ownership of genes, genetic information, or sequences,” but instead only the right to exclude others from utilizing the invention,¹⁷⁹ the risk of an entity “owning” someone else’s genes is unfounded.¹⁸⁰ 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

¹⁷⁶ See *id.*

¹⁷⁷ 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 and 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).

¹⁷⁸ See Utility Examination Guidelines, 66 Fed. Reg. 1093, 1094 (Patent and Trademark Office, Jan. 5, 2001).

¹⁷⁹ See 35 U.S.C. § 271(a).

¹⁸⁰ See Utility Examination Guidelines, 66 Fed. Reg. 1093, 1094 (Patent and Trademark Office, Jan. 5, 2001).

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 the all of the potential consequences of a given invention, whereas, through the disclosures of the patentee, they are in a relatively good position to assess the benefits. Thus, administratively, the lack of a balancing approach may be efficient.¹⁸¹ 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.¹⁸² The question is whether a method to convert a homosexual to a heterosexual satisfies the utility requirement of patent law and accordingly 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

¹⁸¹ Cf. Mark Lemley, *Rational Ignorance at the Patent Office* 95 N. W. 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 Patent Office would be wasteful).

¹⁸² See Larry Thompson, *Search for a Gay Gene*, TIME 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.’”).

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 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 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.¹⁸³

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.

¹⁸³ It could also result, of course, in the abortion of a heterosexual fetus. LEVAY, *QUEER SCIENCE*, *supra* note 23, 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.”).

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 Patent Office 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.).

Grant Both	Differential Grant #1
Grant patent on Gay-to-Straight	Grant patent on Gay-to-Straight
Grant patent on Straight-to-Gay	Deny patent on Straight-to-Gay
Differential Grant #2	Deny both

Deny patent on Gay-to-Straight	Deny patent on Gay-to-Straight
Grant patent on Straight-to-Gay	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 Patent Office 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:

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.¹⁸⁴

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 concern for these marginalized communities could very well be that the

¹⁸⁴ *Id.*

technology, notwithstanding its seeming neutral face, will be used disproportionately against them. Given the construct surrounding the gay gene – there is never talk of a “straight” gene or a more generic “sexual orientation gene” – the most likely scenario would be that the only application would be towards the gay gene. 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 alternatively 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.¹⁸⁵ 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.¹⁸⁶ The examiner acknowledged that “[t]he question of whether humans should be subject of exclusive patent rights raises grave issues going to the core of what a ‘useful’

¹⁸⁵ Office Action on Patent Application No. 10/308,135 (Dec. 3, 2002) (on file with author) [hereinafter *Non-final Rejection*]; see also Office Action on Patent Application No. 10/308,135 (Aug. 11, 2004) (on file with author) [hereinafter *Final Rejection*] (final rejection relying on same basis as non-final rejection).

¹⁸⁶ *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.

invention is.”¹⁸⁷ In embracing the utility standard in the patent statute, Congress was presumptively aware of the moral utility doctrine and “did not disavow” it. The examiner recognized that utility in this context is one of public policy, one that “takes into account the common sense of the community.”¹⁸⁸

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.”¹⁸⁹ 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 face 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.¹⁹⁰

Thus, in this context, the examiner recognized that “utility” is infused with public policies concerns and that consideration of the “community” (whoever that community may be) is important. Technically, however, 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

¹⁸⁷ *Id.* at 22.

¹⁸⁸ *Id.*

¹⁸⁹ *Id.* at 22-23.

¹⁹⁰ *Id.* at 23.

Supreme Court’s reasoning in *Diamond v. Chakrabarty*, where the court allowed the patenting of a life form and noted that it is for the courts to decide patent eligibility in the first instance.¹⁹¹

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. The flat out 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 Patent Office could treat such processes differently and afford patent protection for only gay-to-straight conversions or a methods of preventing homosexuality. Granting technologies in this discriminatory manner undeniably would inflict a clear expressive harm to 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 affording 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

¹⁹¹ *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (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.

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.

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 trait. The odds that the Patent Office 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 highly-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, and the concerns about differential grants of patents involving sexual orientation therefore have 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 at all. 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.¹⁹² 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 a biological materials often can have multiple functions.¹⁹³ Originally, scientists believed the human genome could contain upwards of 80,000 genes.¹⁹⁴ This number, thanks to the Human Genome Project,

¹⁹² 35 U.S.C. § 101.

¹⁹³ See, e.g., Ted J. Ebersole, et. al., *Patent pools and standard setting in diagnostic genetics*, 23 NATURE BIOTECH. 937, 937 (2005).

¹⁹⁴ RIDLEY, *supra* note 55, at 5 (“There are probably 30,000-80,000 genes in the human genome. . .”).

has proven to be a gross overestimation. The current estimate is around 25,000 genes.¹⁹⁵ The consequence of this relatively small set of genes is that a single gene performs numerous functions.¹⁹⁶ 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 as well as 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 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.¹⁹⁷ 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

¹⁹⁵ See Anthony L. Komaroff and George Q. Daley, *Harnessing Stem Cells*, NEWSWEEK, Dec. 6, 2004, at 54. Previous analyses has suggested 30,000-40,000. See Gitter, *supra* note 35, at 1633.

¹⁹⁶ Cf. Gitter, *supra* note 35, at 1671 (noting the potential for “subsequent researchers later [to determine] that the DNA segment was involved in other illnesses”)

¹⁹⁷ Udo Schüklenk, *Science*, ‘Gay Genes’, and the ‘Third Sex’, GAY AND LESBIAN HUMANIST (Spring 1997) (available at www.galha.org/glh/163/etiology.html).

attempts to ‘heal’ gay people.”¹⁹⁸ Investigations into the biological origins is 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.”¹⁹⁹ 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.²⁰⁰ 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 of an expressive impact. In contrast, if someone from NARTH, a group of psychiatrists who still view homosexuality as a pathological disorder, were to discover a gay

¹⁹⁸

Id.

¹⁹⁹

Id.

²⁰⁰

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.

gene, the expressive impact could be even 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, 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 fear that science is likely to harm them, whatever the sympathies of the scientists themselves.²⁰¹

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

²⁰¹ LEVAY, QUEER SCIENCE, *supra* note 23, at 147.

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 as necessarily pathological or in need of curing. Other conditions may not have as strong of 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 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 continue.

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 laws 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.²⁰² 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,

²⁰² Cf. Long, *supra* note 7, at 660-63 (discussing noise in signal to investors).

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.

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 one²⁰³ – 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 section 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 Patent Office maintains its agnostic approach and would allow patents for both conversions from gay-to-

²⁰³ *Cf. id.* 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.”).

straight or straight-to-gay, then the expressive impact would be significantly reduced. If, however, the Patent Office 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 the technology, would be key to minimizing the expressive harm and therefore requiring 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.²⁰⁴ Admittedly, these inventions are not directly related to identity the way that patents on sexual orientation or other behaviors may be, but the argument would be that society has weathered patents on controversial technologies previously and can continue to do so. The burden of fleshing out those technologies that are creating such a harm is not worth the cost.

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 innovation²⁰⁵ or that genes are naturally occurring substances ineligible for patent protection.²⁰⁶ 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

²⁰⁴ See Thomas, *supra* note 149, at 5801-81. Professor Thomas views these patents as privatized regulation that deny access to these technologies, but the grant of the patent could signify government endorsement of the technique as well.

²⁰⁵ See Heller & Eisenberg, *supra* note 35, at 698.

²⁰⁶ See generally Demaine and Fellmeth, *supra* note 177.

patents with the potential for an expressive harm but also 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 underinclusive. 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 may be controlled not only at the genetic level but also at the protein level. A ban on gene patents alone, therefore, still permit patents on various proteins and biological processes, which still has 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 adds 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 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 they 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.

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

A cleaner, morally neutral approach would 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 on the margins of what constitutes “pathological” could create some difficulty, such a condition would be tied to the medical professions 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.²⁰⁷ 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.²⁰⁸

There are also problems with this approach. The line therapy/pathology and enhancement line 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.²⁰⁹ 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.²¹⁰ Arguably, this is not a case of using drugs to cure a pathology – a therapy – but instead to enhance the attention level of individuals.²¹¹

What constitutes pathological 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

²⁰⁷ See FUKUYAMA, *supra* note 15, at 47; ALLEN, *supra* note 34, 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.

²⁰⁸ FUKUYAMA, *supra* note 15, at 208-09; *see also* Markwood, *supra* note 24, at 478-82 (discussing regulation of enhancement technologies).

²⁰⁹ *Id.* at 47.

²¹⁰ *Id.* at 47.

²¹¹ *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.”).

– instead social norms and views of homosexuals changed with in the medical community, resulting in it being eliminated as a pathological condition.²¹² 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. 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.²¹³ The PTO could be 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

²¹² *Id.* at 209.

²¹³ *Id.* at 210-11.

universally would be viewed as 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.²¹⁴ Consequently, the redefinition of utility would apply in other contexts, including to basic pharmaceuticals. Patent protection for things 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-on improvements on already existing drugs.²¹⁵ There are a number of reasons for this reality: the dependency on drug companies on blockbuster drugs;²¹⁶ the ability of companies to extend patent protection effectively on blockbusters through patent and FDA laws and regulations;²¹⁷ and the reduced cost of relying on known drugs in proving safety and efficacy.²¹⁸ Innovation in the pharmaceutical market thus seems anchored to existing drugs, many of which are more driven towards enhancement as opposed to curing pathologies.

²¹⁴ TRIPS, art. 27(1).

²¹⁵ Michie Hunt, CHANGING PATTERNS OF PHARMACEUTICAL INNOVATION 3 (2002) (report by National Institute for Health Care Management Research and Educational Foundation).

²¹⁶ *Id.* at 16.

²¹⁷ *Id.* at 16-18.

²¹⁸ *Id.* at 16.

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 to truly pathological conditions. Less money would be spent on the next generation of Viagra and hopefully more would be spent trying to find vaccines for AIDS.²¹⁹

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 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 a “good” is quite debatable in the context of privatized

²¹⁹ Given the markets for such “lifestyle drugs,” however, it seems unlikely that all research into these areas would completely dry up without patent protection.

eugenics, which the patent system is poised to incentivize.²²⁰ The right to choose may accompany a considerable cost – elimination of groups considered outside the norm.²²¹ While the regulation of this choice undeniably lies outside of the patent system,²²² that system need not embrace destructive choices by allocating a given technology as “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 preventing 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.²²³ Eliminating, or modifying the availability of, patent rights in these areas would at least help to mitigate these commercial interests and make such innovations

²²⁰ FUKUYAMA, *supra* note 15, at 100 (“[W]e should be skeptical of libertarian arguments that say that as long as eugenic choices are being bade my 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 14, at 302 (“How will we distinguish ‘good’ genes from ‘bad’? What traits will be valued and what will be discarded? Who gets to choose?”).

²²¹ 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 14, 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.

²²² See Dresser, *supra* note 164, at 424-31 (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).

²²³ Others have already called for public regulation on biotechnology. See FUKUYAMA, *supra* note 15, 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 197 (“Indeed, why should we assume that legislators in homophobic societies would regulate the use of such devices in the first place?”).

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.²²⁴

²²⁴ Cf. FUKUYAMA, *supra* note 15, at 10 (“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.”).