

HEINONLINE

Citation:

Doriane Lambelet Coleman, The Alchemy of a Moral Discourse about the Biology of Gender: Historical Sensitivity, Genetic Literacy, and the Will to Imagine a Different Equality, 11 Cardozo Women's L.J. 543 (2005)

Content downloaded/printed from [HeinOnline](https://heinonline.org)

Thu Feb 7 21:27:27 2019

- Your use of this HeinOnline PDF indicates your acceptance of HeinOnline's Terms and Conditions of the license agreement available at <https://heinonline.org/HOL/License>
- The search text of this PDF is generated from uncorrected OCR text.
- To obtain permission to use this article beyond the scope of your HeinOnline license, please use:

[Copyright Information](#)



Use QR Code reader to send PDF to your smartphone or tablet device

THE ALCHEMY OF A MORAL DISCOURSE ABOUT THE BIOLOGY OF GENDER: HISTORICAL SENSITIVITY, GENETIC LITERACY, AND THE WILL TO IMAGINE A DIFFERENT EQUALITY

DORIANE LAMBELET COLEMAN*

When it comes to explaining human thought and behavior, the possibility that heredity plays any role at all still has the power to shock. To acknowledge human nature, many think, is to endorse racism, sexism, war, greed, genocide, nihilism, reactionary politics, and neglect of children and the disadvantaged. Any claim that the mind has an innate organization strikes people not as a hypothesis that might be incorrect but as a thought it is immoral to think.

Stephen Pinker, *THE BLANK SLATE: THE MODERN DENIAL OF HUMAN NATURE*¹

I was apprehensive when asked [to direct this project analyzing the current status and implications of work in the area of behavioral genetics] . . . [mostly] because the subject has an ugly history . . . [over time, however, it] became clear that this investigation, believed to be the first of its kind, is necessary if we want to avoid the mistakes of the past, make an impartial assessment of the emerging scientific evidence, and reach valid moral and legal conclusions about the potential applications of the research.

Bob Hepple, Queen's Counsel, *Genetics and Human Behavior: The Ethical Context*, Nuffield Council on Bioethics²

* Professor of Law, Duke University School of Law. B.A. 1982, Cornell University; J.D. 1988, Georgetown University Law Center. For their extremely helpful comments and suggestions, I thank James Boyle, Lauren Dame, Robert Cook-Deegan, Catherine Fisk, Amanda Lacoff, Marcy Speer, Neil Vidmar, and Redford Williams.

¹ STEVEN PINKER, *THE BLANK SLATE: THE MODERN DENIAL OF HUMAN NATURE*, at Preface viii (Viking 2002).

² Bob Hepple, QC, *Preface* of Nuffield Council on Bioethics, *Genetics & Human Behavior: The Ethical Context* (2002) [hereinafter *Genetics & Human Behavior*].

In a lecture delivered in 1928 before The New York Academy of Medicine entitled *What Medicine Can Do for Law*, Benjamin Cardozo explained to his non-legal audience the rule that all modern lawyers know, that the law is to be derived from facts and not "by a process of deduction from metaphysical principles of unvarying validity."³ And, he suggested, in areas related to science, it would necessarily be the scientists who would provide those facts: "Let the facts be known as they are," Cardozo said, "and the law will sprout from the seeds and turn its branches toward the light."⁴ Then, in a discussion that was extraordinarily if not unimaginably prescient, Cardozo focused his remarks on the body of scientific facts that he believed would ultimately have the most significant impact on the law, the then-nascent field of human biochemistry.⁵ He prophesied that developments in this field—while certainly hypothetical in his time—"a century or less from now"⁶ would cause "fundamental change"⁷ in those legal doctrines that relied upon the truth of "the creed that virtue and vice" are "spiritual essences," or, as Socrates said, that "a good soul will by *its* excellence render the body as perfect as can be."⁸ Most conspicuously, Cardozo believed, the field of biochemistry would revolutionize the criminal law, whose theories of punishment other than "vengeance"⁹ are most deeply dependent upon this proposition, and most obviously disdainful of the competing notions that "vice and virtue" are environmentally or biologically determined.¹⁰ He suggested, for example, that we would come to learn from science that "the heavy hand of doom was on [the criminal's] head from the beginning," and thus that "[t]he sin, in truth, is ours—the sin of a penal system that leaves the victim to his fate when the course that he is going is written down so plainly in the files of the courts and the stigmata of mind and body."¹¹ At the same

³ Benjamin N. Cardozo, Chief Justice, Court of Appeals, State of New York, *What Medicine Can Do for Law*, The Anniversary Discourse, The New York Academy of Medicine, Nov. 1, 1928, at 6 (Harper & Brothers 1930) [hereinafter Cardozo].

⁴ *Id.* at 8.

⁵ Cardozo described this field as consisting primarily of "researches . . . into the operations of the ductless glands," which at the time were "still in the stage of speculation or hypothesis." *Id.* at 12. Despite its status as a hypothesis, Cardozo obviously accepted that some truth ultimately would come out of the view that "the internal secretions with their influence upon brain and nervous system, as well as every other part of the body-corporation, as essentially blood-circulating chemical substances, have been discovered the real governors and arbiters of instincts and dispositions, emotions and reactions, characters and temperaments, good and bad." *Id.* at 12-13.

⁶ *Id.* at 21-22.

⁷ *Id.* at 9.

⁸ Cardozo, *supra* note 3, at 13 (quoting Socrates from Plato's *Republic*). Cardozo clearly believed some in this creed himself, as he suggested that one could readily accept the inevitability of some substantial transformation in the law based upon developments in these scientific fields "without acceptance of the creed that virtue and vice are not spiritual essences, but high-sounding synonyms for the hormones of the body." *Id.* at 13-14. In other words, he rejected the prospect as unlikely that science would ever prove that "virtue and vice" were exclusively the result of "the hormones of the body," just as he rejected "the precept that [these traits] are the products solely of environment." *Id.* at 14.

⁹ *Id.* at 16 (using the word "vengeance" synonymously with its more contemporary iteration, "retribution").

¹⁰ *Id.* at 8.

¹¹ *Id.* at 20.

time, Cardozo rejected the prospect that biochemists would ever prove that “virtue and vice are [complete] synonyms for spontaneous secretions”—there was still something to be said for the soul—and Cardozo imagined that science ultimately would teach us that an individual’s morality or capacity for choice results from the interaction of these forces.¹²

* * *

As we reflect on the Justice’s musings just about “one hundred years or less” later, it is impossible not to recognize all that he got right, and how tainted by history these truths are nonetheless. Biochemistry, neurology, psychiatry, psychology, and the Human Genome Project (HGP) have combined with other disciplines and developments to reveal the important relationship between genes on the one hand, and biological and socially constructed environmental influences on the other; the effect of development over time; and the interactions of gene-environment-development relationships on an individual’s expression of (among other things) behavioral traits such as intelligence, personality, behavior, and sexual orientation.¹³ And geneticists working on group-based differences primarily in disease patterns but also increasingly in the expression of behavioral traits are beginning to discuss the significance of these same relationships to their work.¹⁴ In part because of these legitimate developments, it is no longer heretical to note that the *tabula rasa* and individual free will are cultural fictions rather than scientific fact; nor is it unusual to find the law and other societal institutions grappling with the implications of these fictions for doctrine and policy. At the same time, individuals and groups have used bad science throughout modern history to support

¹² Cardozo, *supra* note 3, at 12-15.

¹³ See, e.g., Avshalom Caspi et al., *Influence of Life Stress on Depression: Moderation by a Polymorphism in the 5-HTT Gene*, 301 SCIENCE 386 (2003) (stressful life events are more likely to produce depression in persons with the less active short 5HTTLPR allele than those with the long allele); Avshalom Caspi et al., *Role of Genotype in the Cycle of Violence in Maltreated Children*, 297 SCIENCE 851 (2002) (abuse in childhood is more likely to produce antisocial behavior in men with the less active MAOA-uVNTR alleles than those with more active alleles). See generally *Genetics and Human Behavior*, *supra* note 2, at Parts II (scientific background) and III (reviews of the evidence).

¹⁴ See, e.g., Anne L. Taylor et al., *Combination of Isosorbide Dinitrate and Hydralazine in Blacks with Heart Failure*, 351 THE NEW ENGLAND J. MED. 2049 (2004) (describing results of their study demonstrating that the combination of “isosorbide dinatrate plus hydralazine . . . in addition to standard therapy for heart failure” is “efficacious and increases survival among black patients with advanced heart failure” where the same treatment was not generally successful in white patients); Redford B. Williams et al., *Central Nervous System Serotonin Function and Cardiovascular Responses to Stress*, 63 PSYCHOSOMATIC MED. 300 (2001) (describing the effect of the 5HTTLPR long allele—related to neurochemical/serotonin function—on reactivity to stress, noting the long allele is more frequent in African populations and could account for increased cardiovascular disease risk in African-Americans; describing the variability of effects of this allele on brain serotonin levels among men and women, blacks and whites; noting its relationship to “several facets of the personality dimension of neuroticism (including anxiety, angry hostility, depression, and impulsiveness)”; and emphasizing the significance of environmental factors in the expression of the related genetic predispositions).

discrimination against individuals, racial groups, and the sexes.¹⁵ (Cardozo's speech was itself given in the heyday of the Eugenics Movement.) These abuses of science have deeply tainted our ability to talk openly about the new science, especially as it begins to suggest the existence of differences among sub-groups in the population with respect to genetic potential for expressing certain kinds of intelligence and antisocial behavior. Indeed, it is inevitable that these latest developments will be viewed by many either as old (racist, sexist, classist) sheep in new clothing, or as scientifically legitimate but still too dangerous to touch because of the likelihood that they will be misused to justify existing or new forms of discrimination.¹⁶

Harvard University President Lawrence H. Summers thus ought to have known better when he allowed himself casually to suggest that "a 'much higher fraction of married men' than married women are willing to work 80-hour weeks in order to attain 'high powered' jobs" and that "in the special case of science and engineering, there are issues of intrinsic aptitude, and particularly of the variability of aptitude; and that those considerations are reinforced by what are in fact lesser factors involving socialization and continuing discrimination."¹⁷ Whatever he meant to say, these remarks, given to a conference of economists in February 2005, have been widely read as signifying his belief that he "believes women are intellectually inferior to men."¹⁸ The fact that Summers is the President of

¹⁵ "Science" was used beginning primarily in the mid-1800s to support the perpetuation of slavery in the United States; to resist the recognition of married women's rights to own property and to vote; and to rationalize the Eugenics Movement which (among other things) resulted in hundreds of thousands of forced sterilizations in the United States and culminated in the Holocaust. Throughout this essay, I refer to this use of science as "bad science" and contrast it with the new "good" science. Robert Cook-Deegan explains that "bad science" in this context "is shorthand for a contrast between science that failed to acknowledge the social roots of many distinctions among groups of people, or the role of social, environmental, and historical factors." E-mail from Robert Cook-Deegan, Director of Duke University's Center for Genome Ethics, Law, and Policy, to Author (March 25, 2005, 01:11 EST) (on file with author). The basis for the distinction I make is thus a political and methodological one: The so-called scientific rationalizations for slavery and the Eugenics Movement were nothing of the sort; rather, they were convenient arguments in support of discriminatory policies, imagined out of whole cloth and cloaked in the mantle of science as a way to reinforce their credibility. Cook-Deegan further explained:

They were to modern genetics much like notions of "primitive," and categorization of "inferior" and "superior" groups seem impoverished to modern anthropology, or irreducible particles to modern physics. In contrast, and however politic or impolitic their conception, reputable scientific studies today are the product of more analysis and peer review, and a more rigorous social process for producing "reliable knowledge." . . . This does not mean that their conclusions will always withstand the test of time and additional experimentation, but it does mean that we can have more confidence about the results than was warranted in the previous historical period . . . Science remains a social process subject to error; but it is also more professional and rigorous than it used to be.

id.

¹⁶ See, e.g., *supra* notes 1 & 2 and accompanying text (providing author Steven Pinker and Queen's Counsel Bob Hepple's struggle with this dilemma in the area of behavioral genomics generally); see also JENNY REARDON, RACE TO THE FINISH: IDENTITY AND GOVERNANCE IN AN AGE OF GENOMICS 1-16 (2005) (exploring the explosiveness of the new conversation about race and genetics).

¹⁷ Sara Rimer & Patrick D. Healy, *Summers Releases Controversial Transcript*, N.Y. TIMES, Feb. 18, 2005, at A1.

¹⁸ See, e.g., *id.*

Harvard—symbolically, the leader of the most publicly prestigious intellectual institution in the country—delivered a double whammy to supporters of gender equality: It assured that his words would be heard far and wide, and that they would provide fodder to their otherwise starving opponents. In this regard, one university dean went so far as to describe his remarks as generating an “intellectual tsunami.”¹⁹ Moreover, given that Summers is at least perceived to be less-than-fully committed to rectifying patterns of discrimination on Harvard’s faculty,²⁰ his words rekindled the concern that underlies this area generally, namely, that still today some of our most important leaders are sexist (and racist and classist), and even those who are not nevertheless may be inclined for practical reasons to use the new science to excuse an abdication of leadership on issues of equality. It’s no one’s fault if it is in everyone’s genes.

It is undoubtedly the case that people—even publicly important people—will continue to make the same mistake Summers made, and talk too casually about group-based “intrinsic” and “innate” differences. It is also more likely than not that their words will trigger similar uproars and quieter vindications. The answer to this problem is not, however, to suppress the work of legitimate scientists, or to censor those who would analyze the implications of their research and discoveries. Rather, it is to ensure that the discourse about the scientific “facts” is both historically sensitive and genetically literate; there is simply no room here for sloppy conversation. While the ground is clearly treacherous, understanding the ways and extent to which environmental factors trigger and suppress genetic predispositions is necessary for our ability to evaluate fully the related aspects of institutional structures, policies, and doctrines. As I will suggest below, it is also necessary to the construction of a different equality paradigm that can (in Justice Cardozo’s words) “sprout from the seeds” of these scientific facts, rather than from ultimately fictitious “metaphysical principles of unvarying validity.”

A. HISTORICAL SENSITIVITY

It is a fact that bad science has been used throughout history to support discrimination against women, and in this country also against African-Americans. In both instances, the prejudicial policies that emanated from that discrimination served to perpetuate the dominance of primarily propertied white men in society’s most important institutions, and to entrench the deeply harmful conditions that resulted for these two groups. While prejudicial policies have been formally repudiated, their underlying scientific rationales were so ingrained in the culture that their legacy continues today (despite their repudiation also by most of the society) to suggest the possibility that women and African-Americans may be intellectually inferior and otherwise less likely to be found doing “high (brain)

¹⁹ Sam Dillon & Sara Rimer, *No Break in the Storm Over Harvard President’s Words*, N.Y. TIMES, Jan. 19, 2005, at A14 (quoting Denice D. Denton, Dean of Engineering at the University of Washington).

²⁰ *Id.*

powered” work. In the case of women specifically, the historical notions that smaller brain size and female hormones either preclude our capacity for this work, or else make it much less likely that we will achieve as often at the highest levels, have yet to be buried completely.²¹ Therefore, whenever science appears to suggest the existence of new evidence to support these old notions, it is understandable and indeed inevitable that the motives of its authors and purveyors will be questioned, because a biological explanation for inequality excuses inaction. The fact that the new science is likely to be perceived as “good” (unlike the old “bad” science) is particularly pernicious in this regard, because this new science is more credible.²²

At the same time, because “science is *always* culturally contingent,” even benignly or benevolently motivated scientific research can “reinforce [negative] cultural assumptions.”²³ The areas of scientific study that are privileged in the academy, and funded by both public and private sources, reflect choices that themselves are influenced by individual and institutional politics as well as underlying cultural norms. What we choose not to study thus can assure that scientific knowledge is less than objective and true.

Participants in any discussion of the biology of gender must appreciate this history and its legacy. And they must integrate their substantive lessons throughout the discussion to ensure its legitimacy and probably also its success. This means not only nodding to history in the preface of any public remarks about new scientific theories and evidence, but also (most importantly) using that history and its caveats as one of the prisms through which the theories, evidence, and any resulting implications are evaluated. In other words, in this arena, both form (as a signal of respect and sophistication) and substance (as a methodological point) are critical.

B. GENETIC LITERACY

As Summers explained in a letter to the Harvard faculty written in the wake of the furor over his remarks, “[I should] have spoken differently on matters so complex.”²⁴ Needless to say, he was right. Genetic literacy—knowing and conveying the fundamental principles and relevant details of the science—is essential to any moral conversation about the biology of race and gender, both because of the historical use of bad science to support discrimination against disfavored groups and women, and because of the still-enormous “potential for abuse of findings in this area.”²⁵ It is beyond the scope of this essay even to

²¹ See, e.g., Amanda Ripley, *Who Says A Woman Can't Be Einstein?*, TIME, Mar. 7, 2005, *passim*.

²² See, e.g., REARDON, *supra* note 16, at 2 (describing the reaction of some groups to the Human Genome Diversity Project, including “some physical anthropologists [who] accused the initiative of using twenty-first-century technology to propagate the concepts of nineteenth-century racist biology.”).

²³ E-mail from Lauren Dame, Associate Director, Duke University Center for Genome Ethics, Law & Policy (Apr. 3, 2005, 11:53 EST) (on file with author).

²⁴ Rimer & Healy, *supra* note 17.

²⁵ *Genetics and Human Behavior*, *supra* note 2, at xxii.

describe (what we think we know about) differences in the biology of the male and female brain. Nevertheless, there are a few points that are easily articulated and that can form the basis for a genetically literate discourse on the subject.

First, there is a vast difference between the sort of theorizing and uncontrolled experimentation that historically passed as brain science, and the rigorous analysis and peer review that today characterizes the scientific community's methodology and literature in this area. Thus, while politics still influence science, and while there is still much that we do not know about the biology of the brain, we can have an important measure of confidence in scientific conclusions that have survived this methodology.²⁶ It is critical in this regard that the new science has and will continue to afford possibilities for alleviating human suffering that would not exist but for the willingness of the relevant communities to risk inflammatory developments and to work through the complicated issues they implicate.

Second, relating to the specific context of this essay, while "there are indeed real differences between the male and the female brain" including in the architecture of "the parts of the brain that are related to intelligence," all indications are as most of us expect them to be: Women working at the highest levels in the fields of mathematics, the sciences, and elsewhere do it as well as men.²⁷ This is not a complete response to Summers, of course, as it fails to explain why there are relatively few women working in the stratospheres of these fields. The possibility that some of this disparity may be linked to genomic and/or biological differences thus remains to be evaluated, presumably in the context of ongoing work on sex differences in cognition. This work promises to yield a richer understanding of how the human brain is constructed and operates, and the extent to which genes, biology, and environmental conditions influence gender differences in these respects.²⁸ To the extent that Summers was correct on this point, it was wholly obscured by his sloppy presentation and scientifically unsupportable personal speculation about the significance of innate differences in relation to socialization

²⁶ See *supra* note 15 (explaining the distinction I draw throughout this essay between the "new good science" and the "old bad science").

²⁷ Again, much has been written in the popular press on this subject since Lawrence Summers' remarks. See, e.g., Ripley, *supra* note 21, at 52 and *passim*. For an example from the scientific literature, see Doreen Kimura, *Sex Differences in the Brain*, SCI. AM. SPECIAL ISSUE: THE HIDDEN MIND (2002) (suggesting that "the effects of sex hormones on brain organization occur so early in life that from the start the environment is acting on differently wired brains in boys and girls. Such effects make evaluating the role of experience, independent of physiological predisposition, a difficult if not dubious task."); DOREEN KIMURA, *SEX & COGNITION* (2000) (discussing gender differences in brain structure and cognitive abilities).

²⁸ Some of the most recent and promising work in this area relates to the discovery that women's second X chromosome is not inactive as scientists once believed. According to Huntington Willard, Director of the Institute for Genome Sciences and Policy at Duke University and co-author of a recent study with Laura Carrel published in *NATURE* magazine, women's genomes are inherently more complex and, as a result, possibly more productive than men's. Laura Carrel & Huntington F. Willard, *X-inactivation Profile Reveals Extensive Variability in X-linked Gene Expression in Females*, 434 *NATURE* 400 (Mar. 2005); see also Mark T. Ross et al., *The DNA Sequence of the Human X Chromosome*, 434 *NATURE* 325 (Mar. 2005).

and discrimination as factors that contribute to the gender disparities at issue. In fact, the raging debate about the particular "dose" of each that makes a given person is more of a political argument about functional equality than it is a scientific one about the facts of human "nature."²⁹ While there is certainly sufficient indication that socialization and discrimination play a leading if not the most important role in the interchange, we simply do not know enough about the gene-environment relationship in this context to settle the debate as a factual matter.

Third, whatever innate differences are found to exist among groups that could influence the way the brain processes information, individual genomes also will vary so that a particular person will not necessarily express her group's tendencies. As explained in an important recent report on genetics and human behavior conducted by the British Nuffield Council on Bioethics, with regard to behavioral traits including intelligence, there is no single "gene for X": "More than one genetic factor usually contributes to a particular trait" and "[t]hese multiple genetic factors may interact with each other and have different effects depending on which other factors are present in the individual's genotype."³⁰ In essence, this is the difference between genetics and genomics, and the reason why individuals are generally more alike than not despite generalizations about the genetic characteristics of their subgroups.

Fourth, even where it exists, an individual or group-based genetic predisposition generally does not provide the basis for institutions to ignore environmental factors including discrimination. Rather, such a predisposition may prove the significance of those factors in the expression of the relevant trait, as well as in the development of solutions to address disparities. The Nuffield Council report explains the interaction of genes and the environment this way:

- As well as genetic factors, many non-genetic (environmental) factors may contribute to the manifestation of a trait.
- These environmental factors may also interact with each other.
- The genetic factors may affect which environmental factors have an effect. (This is called gene-environment interaction.)
- Conversely, environmental factors may affect which genetic factors have an effect.

²⁹ This debate is exemplified in the indirect public exchange between Lawrence Summers and Howard Georgi, "a physics professor who has been part of a successful effort in Harvard's physics department to recruit more tenured women." Rimer & Healy, *supra* note 17. In response to Summers' particular suggestion that "issues of intrinsic aptitude . . . are reinforced by what are in fact lesser factors involving socialization and continued discrimination," Georgi stated, "It's crazy to think that it's an innate difference . . . It's socialization. We've trained young women to be average. We've trained young men to be adventurous." *Id.* The heat has been so intense on this point, that Summers himself quickly offered a retraction, noting that "he had 'substantially understated the impact of socialization and discrimination'" on the disparity of women in the relevant academic disciplines. *Id.*

³⁰ *Genetics and Human Behavior*, *supra* note 2, at xxii.

- Certain genetic and environmental factors may go hand in hand. (This is called gene-environment correlation.)
- A protein may be modified after it has been produced from a gene, and this can alter its function.
- Genes do not have continuous effect in our bodies. They may be turned on and off, both during our overall development and within the lifetime of an individual cell.³¹

While we cannot yet alter our genomes, we do have an important measure of control over our environment. Thus, to the extent that we understand the relationship between particular gene-environment combinations, we can begin to conceive of environmental solutions to avoid or mediate the expression of maladaptive predispositions and to nurture adaptive ones, in both individuals and groups: "Genetics is not destiny."³²

C. A DIFFERENT EQUALITY

Prevailing anti-discrimination doctrine has mostly focused on affording disadvantaged groups the right and privilege to be treated just like advantaged groups. Under this model, where race is concerned, African-Americans and other disfavored minorities are required to be viewed as though they were white. And where the issue is gender, women are required to be viewed as though they were men. Equality is thus defined according to the terms set by the advantaged groups.³³

This model, including as incorporated in equal protection doctrine, has worked to guide policies that have themselves achieved enormous gains for both women and minorities. To the extent that white men receive the human equivalent of "most favored nation" status in our educational and political institutions and in the workplace, women and minorities have received many of the benefits of that status where they can show that they are otherwise similarly situated. The fact that this conception of equality has not (yet) been entirely successful does not diminish

³¹ See *id.* at xxi.

³² E-mail from Robert Cook-Deegan, Director of Duke University's Center for Genome Ethics, Law, and Policy, to Author (March 25, 2005, 01:11 EST) (on file with author). Environmental solutions could involve the elimination of environmental forces that enable the expression of genetic predispositions, or teaching people to mitigate the effect of those forces when they cannot be eliminated. As Professor Redford Williams explains, "when the environment is a source of stress, it is always ideal if one can change the environment to make it less stressful. But when this is hard or even impossible—e.g., it's not clear that the economic, political and social upheavals that are contributing to poor health in Central and Eastern Europe since the USSR breakup are amenable to being fixed so that the stresses those populations face will be reduced—it may still be possible to teach people, even those who are genetically more sensitive . . . to cope better with those stressful environments in ways that at least reduce the harm." E-mail from Redford Williams, Professor, Duke University, to Author (March 23, 2005, 01:54 EST) (on file with author).

³³ See KATHARINE T. BARTLETT & ANGELA P. HARRIS, *GENDER AND LAW: THEORY, DOCTRINE, COMMENTARY* 101-102 (2d ed. 1998) (discussing the theory of formal equality upon which the Supreme Court's gender equality cases are based, including the autonomy principle which requires that "each woman be given the opportunity to show eligibility for the desired benefit on the same basis as men.").

its significance or continued value. And, contrary to Lawrence Summers' suggestion, it also does not mean that we should turn primarily to "innate differences" to explain the remaining disparities.³⁴

At the same time, just as advances in genomic medicine have shown that equal treatment for every individual (regardless of gender or continent of historical origin) may not mean prescribing drugs that were developed and determined to be efficacious based on a population study that included primarily white men between the ages of 20 and 50, so too it could be that equality for women in education, the workplace, and elsewhere may not always mean the right and privilege to conform to the prevailing male construct. Instead, just as medicine is moving toward the development of drugs that will be tailored to genomic differences, other institutions might tailor their structures to reflect the fact that environmental stimuli and circumstances sometimes differently affect the ability of men and women to succeed. As one researcher has urged, because "boys and girls are innately different" it is necessary to "change the environment so differences don't become limitations."³⁵ This alternative model of equality would not require that institutions afford women the same opportunities and circumstances as men, but rather that they afford both the particular environment that would allow each to succeed to the same extent.³⁶

Some institutions, academics, and policymakers have already begun to conceive and implement structural reforms in accordance with a version of this idea. Thus, for example, researchers are re-imagining same-sex elementary education, not as a way to assure that girls/boys are not distracted by each other and the peer pressures that are reflected in that dynamic, but as a way to achieve better rates of efficiency and success for both groups in light of what are apparently different maturation rates of some brain functions.³⁷ And some universities and corporations (including law firms) are reevaluating their established expectations and incentive structures to reflect the fact that women, who clearly can do "high (brain) power" work and whose contributions are extremely valuable in these

³⁴ See Rimer & Healy, *supra* note 17 (reporting on Summers' remarks particularly concerning his view that innate differences may be predominantly responsible for the gender disparity found on academic faculties in the sciences, with "socialization and continuing discrimination" as "lesser factors" in the equation).

³⁵ Ripley, *supra* note 21, at 56 (describing the argument of Leonard Sax, author of the book *WHY GENDER MATTERS* (2005)).

³⁶ Gender law theory presumably would consider this model to fall within claims for "substantive" rather than "formal" equality. See, e.g., BARTLETT AND HARRIS, *supra* note 34, at 261-262 (discussing substantive equality generally), and at 311-411 (exploring arguments to "eliminat[e] the disadvantages of women's differences, and "sex-linked average differences").

³⁷ Ripley, *supra* note 21, at 56. Research indicates that "most parts of the brain mature faster in girls" although "some areas mature faster in boys." *Id.* at 55. "Specifically, some of the regions involved in mechanical reasoning, visual targeting and spacial reasoning appeared to mature four to eight years earlier in boys. The parts that handle verbal fluency, handwriting and recognizing familiar faces matured several years earlier in girls." *Id.* It is not known whether these physiological differences in development are entirely the result of "innate" or genomic blueprints, or of the interaction between innate predispositions and environmental influences. Nevertheless, they are apparently very much biological in nature by the time they are studied by neurologists.

respects, sometimes are drawn (apparently differently than men and for as yet undeciphered reasons) away from the traditional career track when they are raising children.³⁸

It is obviously beyond the scope of this essay for me to do more than describe the rough contours of an outcome-based model of equality. Nevertheless, re-envisioning anti-discrimination doctrine in the law to conform to these contours has some attractive and important features, and thus, I hope it can engender useful discussion about its details and viability. For example, to the extent that it is true that boys and girls, men and women, who are otherwise similarly-situated intellectually are nevertheless different in terms of their capacity to respond, or are at different maturation points, or differ in their sensitivities to particular environmental contexts, this model would eliminate an inherently (and ironically) discriminatory feature of the prevailing paradigm which treats everyone the same. It also would be truer to the facts than this paradigm, which is based on the twin legal fictions that women and men are the precisely same other than in their (in)ability to gestate, and that all other differences are merely the result of socially-constructed stereotype. In this way, it would also be truer to legal tradition, which, as Justice Cardozo suggested, generally is based in the facts. While these twin fictions are essential to protecting the opportunity for gender parity under existing law, the danger inherent in their rejection would be much less apparent in a different jurisprudential setting that nevertheless accomplished the same (if not better) ends.

At the same time, and even in its rough state, this model has important deficiencies. Embracing a “vive la différence” approach to equal protection doctrine undoubtedly will be viewed by many as all expressions of gender difference are—see the reaction to Lawrence Summers’ remarks—as either the product of a conscious effort once again to use science to abandon progress toward real equality, or as risking a return to the days where women were primarily encouraged to be homemakers. Additionally, substantial questions will arise about the practical, political, and economic feasibility of its implementation. What would it require, for example, to restructure public elementary education to reflect inherent learning differences in boys and girls so that by high school both groups were equally proficient in social and verbal skills as well as in math? And what

³⁸ This particular kind of reform has been criticized by those who believe that gender differences are predominantly the result of socialization: If we would just treat little girls and women the way we treat men, both groups would have the same tendencies one way or the other, and thus such changes would either not be necessary at all or they would equally desired (for intellectual reasons) by both. The contrary argument—which I prefer—is that such reforms make sense *so long as they do not inhibit women who want to from progressing according to a different (e.g., the prevailing male) paradigm*. I personally suspect that women’s behavioral patterns in these respects are the result of a complex interaction of genetic predispositions and environmental factors including socialization, which is why I include them in this set of illustrations. If I am right, an institutional model that recognizes the role that biology plays in the equation is most likely to result in an appropriately diverse and successful workforce. Even if I am incorrect, however, there is no real-world merit (or moral principle, for that matter) to giving women who are deeply committed as a result of socialization *both* to raising their children *and* to succeeding in the workplace only an “either/or” solution.

would it require to redesign incentives and the workplace environment to reflect gender differences in adaptability so that both men and women could be equally successful? While the necessary economic incentives (and thus the political will) clearly exist to develop designer drugs, it is questionable whether the same could be had for fundamental cultural and institutional reforms.

However difficult these questions, this alternative model is an essential part of the discourse about the biology of gender. Advances in neuroscience, genetics, and genomics will continue to test the intellectual integrity of the prevailing paradigm and its dependence on the notion that men and women are the same.³⁹ At the very least, the alternative allows for its objective—continued progress toward substantive equality—to remain a central commitment even as this challenge is engaged, so that its proponents are not faced with the false choice either of abandoning the discussion or the promise of equal protection. At best, it provides the rough outlines for a “designer equality” that may better fit the facts, and thus the development of the soundest legal doctrine.

* * *

At the time of their respective remarks, Justice Cardozo and President Summers had quite a bit in common. They were both important public intellectuals whose words had the power to encourage or retard progress toward justice. They were both sufficiently interested in “spontaneous secretions” or “intrinsic aptitude” that they bothered to give speeches on the subject. And, in a rough way, they were both correct that these likely would combine with other influences to make the person who she is. Ultimately, it is history and knowledge that distinguishes the two men and the value of their words. Since Cardozo opined that “the course that [a person] is going is written down so plainly in . . . the stigmata of mind and body,” bad science has been used to rationalize terrible discriminations, and good science has shown how important it is to speak carefully and with relevant sophistication on “matters so complex” as the biology of the human brain. The alchemy of a moral discourse on the biology of gender in particular requires a healthy dose of historical sensitivity and genetic literacy, as well as an ongoing commitment to equality.

One final note. My colleague James Boyle is fond of saying that there is no such thing as a new idea. As he is quick to acknowledge, this itself was not his idea; and so too the things I have written in this essay are not new. The literature in related disciplines is both implicitly and explicitly redundant regarding the need for historical sensitivity when discussing group-based biological difference. Similarly, whenever complicated scientific issues are mutilated in the public discourse, there is an outcry for more careful conversation. And certainly others have critiqued the

³⁹ See generally EXPLORING THE BIOLOGICAL CONTRIBUTIONS TO HUMAN HEALTH: DOES SEX MATTER? (Theresa M. Witzmann & Mary-Lou Pardue eds., 2001).

prevailing view of formal equality, and thoughtfully considered different approaches. Nevertheless, what I hope at least to have reinforced is that when the conversation about the biology of gender (or race) takes place, it can only be successful in circumstances where the participants embrace these principles.

