MYTHS AND REALITIES IN THE SAMENESS/DIFFERENCE DEBATE

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Remarks made by Lawrence H. Summers, the President of Harvard University, suggesting by his "best guess" that "intrinsic aptitude" primarily accounts for the paucity of women holding senior academic positions in math, physics, engineering, and technology[1] have touched off a new round in a timeless debate over gender sameness and difference. This seeming bow to biology, emanating from the head of the nation's most prestigious academic institution, conjures up memories of yet another Harvard figure almost a century and a half ago. At that time, Dr. Edward Clarke, a member of Harvard's Board of Overseers and a former member of the Harvard medical faculty, warned with great certitude that secondary and higher education would harm women's reproductive abilities.[2] While President Summers undeniably would agree that history has proven Dr. Clarke wrong, his troubling comments merely echo conclusions drawn from now popularized studies in neuro-psychology suggesting that women and men are simply hard-wired differently.

Until recent years, women's advocates strongly resisted research on sex differences. For them the issue itself lacked a scientific base, was politically motivated, and inevitably would harm women's struggle for social equality. That resistance has slowly turned to caution as new statistical techniques and technology have afforded research findings on gender differences greater credibility. Functional magnetic resonance imaging (MRI) scans, electroencephalograms (EEGs), and positron-emission tomography (PET) have enabled scientists to view how women and men process information and how their brains develop from childhood to adolescence and into adulthood. As a result, researchers have documented a range of structural, chemical, and functional brain differences linked to gender. Some of these appear to arise from the moment of birth.[3]

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[1] Lawrence H. Summers, *Remarks at NBER Conference on Diversifying the Science & Engineering Workforce*, Cambridge Massachusetts, January 14, 2005, *available at* http://www.president.harvard.edu/speeches/2005/nber.html (last visited May 5, 2005).

[2] EDWARD CLARKE, SEX IN EDUCATION; OR, A FAIR CHANCE FOR THE GIRLS 133 (1873).

[3] *See* Larry Cahill, *His Brain, Her Brain*, SCI. AM., Apr. 25, 2005, *available at* http://www.sciam.com/print_version.cfm?articleID=000363E3-1806-1264-980683414B7FO (on file with author).

Over the past decade, this discussion has filtered through the pages of the news media, where the question of hormonal influence on learning and behavior in particular has captured the public's imagination. Findings from brain research have lent scientific legitimacy to the argument that the structure of the brain differs slightly from birth, depending on the amount of testosterone present at that point. This variation, it is argued, may explain such conventionally ascribed male traits as aggression and competitiveness.[4] Studies have suggested that hormonal changes in puberty may further influence phonological processing skills, which in turn, may account for the higher percentage of male dyslexics particularly identified past childhood. Other studies have documented the more rapid maturation of the female brain. They also have found sex differences in the specific regions of the brain activated for sound recognition (related to language and reading skills favoring girls) and spatial performance (related to mathematical skills favoring boys).[5]

Despite these variations, however, there is general agreement that innate abilities are not carved in biological stone but rather respond to outside influences which either reinforce their strength or counteract their weakness. The psychologists Eleanor Maccoby and Carol Nagy Jacklin made this point clear over three decades ago in their classic study, *The Psychology of Sex Differences*.[6] They too found that girls have greater verbal ability and boys excel in the visual-spatial and quantitative realms although subsequent reworking of their data revealed that gender accounted for less than five percent of the variance in the latter.[7] They suggested, nonetheless, that where one sex is more biologically disposed to perform certain tasks, this difference in ability influences popular beliefs and expectations about the sexes. As a result, innate tendencies help create a "cultural lore" that children pick up from their environment. And so they adapt themselves to a normative view grounded in biological reality. Meanwhile, both home and school reinforce initial differences by providing children from an early age with activities, experiences, and play objects suitable to their perceived talents.[8] The media provide further support. A look at television programming, including the role

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[4] Merrill McLoughlin, *Men vs. Women*, U.S. NEWS & WORLD REPORT, Aug. 8, 1988, at 50-56; Laura Shapiro, *Guns and Dolls*, NEWSWEEK, May 28, 1990, at 56-65; Andrew Sullivan, *The He Hormone*, N.Y. TIMES MAG., Apr. 2, 2000, at 46-59.

[5] Bennett A. Shaywitz et al., *Sex Differences in the Functional Organization of the Brain for Language*, 373 NATURE 607 (1997); Georg Gron et al., *Brain Activism During Human Navigation: Gender-Different Neural Networks as Substrate of Performance*, 3(4) NATURE NEUROSCIENCE 404 (2000).

[6] ELEANOR EMMONS MACCOBY & CAROL NAGY JACKLIN, THE PSYCHOLOGY OF SEX DIFFERENCES (1974).

[7] Janet Shibley Hyde, *How Large Are Cognitive Gender Differences? A Meta-Analysis Using* ω^2 *and d*, 36(8) AM. PSYCHOLOGIST 892, 894-897 (1981). For analyses finding even smaller and more nuanced gender differences using more recent data and advanced statistical methods, see Janet Shibley Hyde & Marcia C. Linn, *Gender Differences in Verbal Ability: A Meta-Analysis*, 104(1) PSYCHOLOGICAL BULL. 53 (1988); Janet Shibley Hyde, Elizabeth Femmena &Susan J. Lamon, *Gender Differences in Mathematics Performance: A Meta-Analysis*, 107(2) PSYCHOLOGICAL BULL. 139 (1990).

[8] MACCOBY & JACKLIN, *supra* note 6, at 94.

models presented, as well as commercials targeted toward the children's market, speak volumes on the social underpinnings of gender differences.

More recently, Maccoby has reaffirmed that girls and boys have different growth timetables, not only in language development but in the "inhibitory capacities" underlying the regulation of emotions. From infancy boys have a higher basal metabolism rate and appear more "excited by threats, challenges, and competition." Yet again, she makes clear that humans have an extraordinary ability to learn and to adapt to their sociocultural context.[9]

Research efforts to determine the precise magnitude and source of sex differences in cognitive abilities are still very much a "work in progress." Nonetheless, as popular books now display lengthy lists of "innate" sex-linked traits based in tentative research findings, there is an almost irresistible temptation to accept these assertions as scientific "truth." And as psychologists further detail sex differences in brain anatomy and brain function,[10] there is an intuitive urge to magnify these differences beyond the evidence and to draw wide sweeping conclusions about innate abilities and their impact on real-life performance.

Findings from brain research understandably lend themselves to potentially dangerous misuse and misleading implications. By focusing on the differences between females and males, moreover, we tend to ignore the variation within each group. Although the mean for one group may be higher than for the other, depending on the specific trait, there is substantial overlap between the two and the differences are small. At the same time, methodologists warn that relatively small mean differences can produce rather large differences at the tails or extremes of the distribution, which may partially account for the large proportion of males at the top and at the bottom of the academic achievement ladder.[11]

The obvious danger in this entire exercise is that it is easy to simply dismiss academic performance or subsequent career advancement as purely a function of biology with a touch of lifestyle choice thrown into the latter. That dismissal surely shortchanges both females and males, relegating each to a predestined, limited, and gender-locked future while ignoring the larger and diverse social contexts in which children are raised and educated and later live their adult lives. There is also the risk of interpreting "different" as "deficient," an approach that in the not-so-distant past worked to the educational and social disadvantage of women who presumptively could not measure up to the norm of "maleness."

A more measured position concerning the available research would acknowledge that there are indeed some biological differences between females and males and that these may affect learning in some measure. But it also would take

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[9] ELEANOR E. MACCOBY, THE TWO SEXES: GROWING UP APART, COMING TOGETHER 116-117 (1998).

[10] *See, e.g.*, MICHAEL GURIAN, BOYS AND GIRLS LEARN DIFFERENTLY: A GUIDE FOR TEACHERS AND PARENTS 13-42 (2001); LEONARD SAX, WHY GENDER MATTERS: WHAT PARENTS AND TEACHERS NEED TO KNOW ABOUT THE EMERGING SCIENCE OF SEX DIFFERENCES 11-33 (2005).

[11] Hyde, *supra* note 7, at 894.

into account that educational programming can mediate to a significant degree between these differences and the equally powerful forces of sociological conditioning. Genes do not dictate our destiny but rather define a range of possibilities. The potential for realizing these possibilities can be quite large, given appropriate attention. The case of physics is a clear example. While the fact that women earned only 18 percent of the Ph.D.s in physics in 2003 might seem disappointing, it is far higher than the 2.4 percent earned in 1970 yet also lower than the 25 percent currently earned among women in France and Turkey.[12] Innate ability differences alone cannot account for these disparities in time and place.

And so rather than focus on brain differences of indeterminate size and inconclusive relevance to learning, it would prove more reasonable and productive to examine the stages at which certain abilities typically develop in females and males, all the while remembering that there are variations within each sex group. It then becomes a matter of how to improve the differential performance and maximize the potential of different populations without falling into the pitfalls of harmful stereotypes and gender essentialism.

The current controversy now swirling around academia, and the more recent research findings threaded throughout, must be considered with a watchful eye toward the nuanced effects of biology, socialization, and bias and how these factors interact in the lives of girls and women, and particularly women in traditionally male careers like the sciences. As the recent firestorm at Harvard slowly subsides, we must still look critically on claims in the popular press that gender differences in academic achievement and career paths are largely the result of "hardwired" sex differences. Meanwhile, greater attention needs to be paid to enhancing innate abilities through education and practice and to addressing the more subtle forms of gender bias that may continue to impede women's professional progress.

[12] Kenneth Chang, *Women in Physics Match Men in Success*, N.Y. TIMES, Feb. 2, 2005, at F2.