

BOYS AND GIRLS

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Thank you for the opportunity to address our club again. Last time, I wrote about how our local communities, state and nation could possibly create many unsustainable economic situations that are sure to fail without severe modifications. Examples are underfunded Social Security, Medicare, government employee pensions and other policies that inhibit our society's wealth creation and threaten our economic competitiveness in the world. These are issues that I have not only studied but more importantly that affected the environment in which I lived throughout my professional life, whether in the corporate world or while founding and running a business.

This evening, we'll consider a subject about which all of us have probably questioned in our personal and professional lives and which President Obama discussed last weekend. In one context, Larry Summers, when president of Harvard University, raised the issue of tonight's topic when he asked the supposedly insensitive, convoluted question, "It does appear that on many, many different human attributes-mathematical ability, scientific ability-there is relatively clear evidence that whatever the difference in means -which can be debated-there is a difference in the standard deviation, and variability of a male and a female population. And that is true with respect to attributes that are and are not plausibly, culturally determined." Dr. Summers created a firestorm by his politically in-correct but very essential question about human nature. How often do you ask yourself similar personal questions?

How do you explain to yourself the differences when you observe your two year old granddaughter pretending to have a tea party, or having a fashion show, or role playing mommy by caring for her dolls whereas your grandson of the same age is wrestling a friend, or playing in the mud, or pretending races with his toy cars, or building with blocks. How and why does this behavioral disparity happen and why so early in life?

In the political arena, we all hear about the overall median earnings gap of approximately 20% between men and women which is interpreted by many people and women rights activist as a clear proof of workplace wage discrimination, and thus is justification for more government regulation in the form of a "paycheck fairness" bill. This bill's intent is to hold employers liable for the "lingering effects of past discrimination", so employers would not only have to guard against intentional or unintentional current discrimination but also "potentially discriminatory assumptions behind market-driven wage disparities that have nothing to do with sexism." Are there any explanations for the income differences between men and women besides alleged sexist workplace wage discrimination?

Many studies have addressed the gender wage differential, and the reasons for it are not as simple as alleged “workplace wage discrimination.” A Labor Department Report in 2009, “An Analysis of the Reasons for the Disparity in Wages Between Men and Women” evaluated more than fifty peer-reviewed papers and found many factors contributing to the wage differences. The most significant factor was the disparity in occupations in which men and women typically work, and this finding was confirmed by numerous peer reviewed independent studies using different data sets. Interestingly, as the job descriptions within categories and firms became more precise, the compensation of men and women became almost equal. Since the 1970s, the occupational composition of the female labor force has evolved dramatically, and thus this trend has been a major factor in closing the gender wage gap from about 62.5% in 1979 to about 80.5% of men’s in 2006. Women’s wages have increased relative to men because “women have behaved differently than they have previously in terms of the skills of women who have entered the labor force, their attachment to the labor force, their investment in forms of human capital that are valued highly in the labor market.” Women have changed their academic focus in recent years to courses of study that are linked to skill sets and jobs more valued in the job market, such as business and mathematics, a focus similar to men’s studies over many generations. Another significant contributor to women’s gains is increased work experience that is credited for closing one-third to one-half of the wage gap. Career interruptions are more frequent among women than men for childbearing, raising children, and elder care, all of which impact wages. The gender wage gap is also affected based on the industries in which people are employed and their gender distribution. In combination, the transition in women’s occupations, their gains in work experiences, their career interruptions’ impact, and their selection of industries account for between sixty-five and seventy-six percent of the about twenty percent gender wage gap. The remaining five to seven percentage points of the wage gap that cannot be quantified is attributed to women’s life style preferences:

- A greater percentage of women than men choose working lower paid part-time jobs.
- Women leave the work force for raising children and providing elder care.
- Women prefer “family friendly” workplace policies and take compensation in non-wage benefits.

The bottom line is that women’s career preferences, choices and tradeoffs are often different than men’s, and thus naturally provide benefits tailored to their needs.

How and why does this career behavior disparity occur?

The answer is somewhat complex. Recent understanding of biochemical influences beginning at conception, extending into puberty and also into later stages of life have

revealed that the male and female brain are inherently different, both biochemically and structurally. Knowledge of these differences in the structure and function of the male and female brain first became known at the beginning of the new millennium. Research revealed how the structure, genetics, hormones, function, and chemistry of the male and female brain affects their energy, sexual drive, thought processes, behavior, and well being. New brain science altered the understanding of the basic neurological differences between men and women. Instead of only studying the differences of each gender's brains on cadavers or individuals with brain damage, scientists started to observe the functioning of the brain in real time using new scientific tools. These tools include genetics and chemical tracers and noninvasive brain-imaging technology such as functional magnetic resonance imaging scans. These investigations were conducted when the brain was solving problems, speaking, observing facial expressions, retrieving memories, finding mutual trust, falling in love, listening to babies cry, and feeling nervousness, fright, and despair. Findings concluded that men and women use different brain circuits to hear, see, "sense," and evaluate each other's feelings. For example, women have eleven percent more neurons than men in the brain centers used for hearing and language as well as superior brain centers for gauging the emotions of others. The result is that women are better at expressing emotions and remembering the details of emotional events. In contrast, men have two and half times the brains space dedicated to sexual drive and larger brain centers for action and aggression. Overall, the female brain has strong attributes: "outstanding verbal ability, the ability to connect deeply in friendship, nearly a psychic capacity to read faces and tone of voice for emotions and states of mind, and the ability to defuse conflicts." A man's brain is more adept at muscular activity and aggression, mate and territorial defense, sexual drive, rough and tumble play, exploratory behavior, and immediate problem solving. Both the female and male brain dynamically change during different phases of life, starting in the womb and on through childhood, puberty, sexual maturity, child bearing, parenthood, and beyond. We'll examine several phases to see how these affect men's and women's priorities, behaviors, interests and life goals.

For the first eight weeks of life, the fetal brain in both sexes appears female. At week eight, a males tiny testicles emit testosterone that "masculinize" his brain and body, destroying brain circuits in the areas for processing communications and growing more cells in the sex and aggression centers. In fetal females, the testosterone surge does not occur, and thus circuits in the communications and emotions centers continue to grow. Subsequently, in males another hormone MIS joins testosterone and "defeminizes" the male fetus by a process of chemical inhibition of female organs and female brain circuitry. This process is known as "apoptosis"...or programmed cell death. The impacts of this hormonal divide are that females will be more communicative, have more empathy, and observe in many more ways and are more talkative than males, as a population. And, males will process larger male brain circuits

for exploratory behavior, spatial skills, muscular and motor control, and rough and tumble play.

An interesting study at Stanford University among twelve month olds demonstrated differences between the girls' and boys' desires and abilities to communicate and explore. A child and the mother were taken into a room and instructed not to touch a toy cow while the mother stood off to the side. Videos recorded every glance and movement of the tested children. The forbidden toy cow was touched by very few girls even though their mothers never repeated the instructions. To check for signs of approval or disapproval, the girls looked at their mothers' faces much more often than the boys. Conversely, the boys moved around the room relentlessly and often touched the forbidden toy cow, even though their mothers shouted, "No." Recent extensive high tech research shows that these behaviors and abilities are consistent among populations of boys and girls and part of the reason is the difference in their hormones and biology. In effect, the girls are "hardwired" and the boys are "unwired."

Thus, when we enjoy observing the behavior of our granddaughters and grandsons even at the tender age of two, their behavioral differences are largely determined by nature. Between birth and about age one, a boy's brain is affected by about the same amount of testosterone as an adult male. A girl's infantile puberty ends about age two and a half. From this time until the onset of puberty, chemically things are relatively quiet. During this time, girls want to play with girls and boys with boys, and the reason for this preference is largely unknown. Girls during this time want to form close one-on-one relationships whereas boys' relationships are more about games, activities, social rank, defense of territory and physical strength. There is a pathological condition called CAH (congenital adrenal hyperplasia) that exposes a fetus to large amounts of testosterone about eight weeks after conception. If a female fetus is exposed to this increased testosterone influence, the resultant behavior is more similar to a male with less eye contact, less social interaction, and more roughhousing.

In addition to nature's impact, adult interactions with boys and girls encourage them to respond to adult preferences so the children learn the social expectations for each gender. The repetitiveness of these interactions play important roles in reshaping brain circuitry even though it is not known to what extent, and it is possible that male and female brains may have different degrees of susceptibility to environmental conditions, which is a topic of ongoing research.

Going through puberty magnifies the differences between genders. A male's testosterone level increases twenty fold and along with the increasing vasopressin and MIS during puberty there are changes in a male's ability to focus and think. Also, girls change dramatically when estrogen, progesterone, testosterone and other hormones circulate through their system. But first, let's look at the hormonal impact on male

behavior. A boy's primary preoccupation, as you might recall, becomes girls' breasts, her figure, and other female body parts and his own personal sexual fantasies and satisfaction. He is also becoming territorial protective, acquiring sensitivity about his place in the male hierarchal pecking order, developing the male fight-or-flight response, challenging authority, and avoiding adult supervision. Testosterone has also been shown to decrease boys' interest in talking and socializing, except about sports and sex, and thus encouraging boys to live and work in solitary environments, such as at their computer or isolated activities.

Girls take a very different path with estrogen-progesterone surges from their ovaries that come in two repeated monthly waves in addition to a low and high cycle of testosterone and androgen. Estrogen-progesterone makes certain that the female specific brain circuits will be more sensitive to emotional signals and will increase the need for even more socialization. Girls strive to establish closer relationships with other girls, and long, intense conversations sharing secrets help create close bonds. The neurochemicals dopamine and oxytocin create a pleasurable rush and motivate girls even more to these ends. They become focused on their appearance, compare themselves to their peers, strive to prevent social conflicts, and stress out more. About ten percent of girls get extremely edgy and easily upset when the estrogen and progesterone hormones bottom out in the fourth week of their monthly cycle and the brain yearns for their calming effect. An additional eighty percent are more mildly affected by this hormonal cycle, for a total of ninety percent. Some of the feelings girls experience are hostility, hopelessness, panic attacks, fear, and uncontrollable crying. During this cycle, a girl's prefrontal cortex of the brain is stimulated and behavior and judgment can be jeopardized by a small degree of stress and result in aggregated emotional responses and out-of-control behavior.

The research indicates, as Dr. Louann Brizendine, a professor at UCSF, contends in her two books, **The Female Brain** and **The Male Brain**, that Larry Summers was incorrect when he said that girls are inherently inferior to boys' in mathematics and science aptitude (ability). As both genders approach their teenage years, the difference in these subjects is nonexistent. But when estrogen saturates a girl's brain during puberty, she focuses on her emotions and communications with others, and thus her priorities are diverted from solitary disciplines such as mathematics and the sciences. Boys perform significantly better on the SAT math test than girls. For example, in the 2010 SAT math exam boys' average score was 34 points higher than the girls' results, a trend since 1972. Above the 70th percentile (580 score), boys outnumbered girls. As the test scores increased by 10-points, the male to female ratio steadily increased, peaking at a 2.08 male/female ratio for perfect 800 scores. Dr. Brizendine concluded these different math scores were the result of males becoming more solitary and less communicative as testosterone floods their brains, and thus they desire and can spend

more time working alone, which math and science require. The overall impact is that during these years boys and girls are learning about themselves and formulating the trajectories of their careers. Girls lose interest in paths that require solitary work and fewer human interactions and instead prefer careers requiring more social relationships. A study completed in 2009 for the Federal Reserve Board of New York, which studied "College Major Choice and the Gender Gap" showed that men and women select their major field of study for dramatically different reasons, and these choices led to different career paths with different financial remuneration

This paper determined and evaluated the reasons why males and females selected their college majors. There are significant differences in future earnings of people majoring in different disciplines due to the career paths they chose. For example, an education major earns only 60% of an engineering graduate. These findings are very consistent with the scientific findings about the differences between boy and girls discussed earlier in this paper. Non-financial considerations account for about 80% of the choice of major for females, such as parental approval and enjoying course work. Juxtaposed, anticipated financial considerations of the workplace are the most important criteria for males and explain 48% of their choice. Reconciling family desires and obligations and enjoying the workplace at future jobs rank second in terms of importance for females but these motivations are the least important criteria for males. In summary, females highly value the nonfinancial aspects of the workplace and males most highly value the financial rewards.

The issue of why only 2% of women major in engineering versus 12% of men further addresses the heart of this social issue, and applies not only to engineering but many other fields and ultimately women's income as compared to men's. The Federal Reserve paper found that the two and a half to one gender gap between men and women majoring in engineering and science was because women did not believe they would enjoy the course work and enjoy the work on the jobs. The "Study of Mathematically Precocious Youth" of the early 1990s corroborates this pattern of career selection as it found that mathematically talented women preferred careers in law, medicine, and biology, which value many inherent female attributes, over careers in the physical sciences and engineering. Importantly, females' beliefs about future earnings are insignificant in selecting a major. Females' beliefs in their academic ability in engineering, self-confidence, and belief in the labor markets fairness are very similar to males and are not a factor for women not majoring in engineering. From an experiment, the paper's author determined that if females' beliefs about enjoying coursework in engineering were the same as males, the gender gap between male and female engineering majors would drop 50%. The author Basit Zafar hypothesized, "It could be that females prefer fields that value female-specific attributes..."

The earlier discussed biological research summarized in Dr. Brizendine's work shows that women to a great extent are hardwired by their genes and hormones with certain female attributes such as better communication, personal bonding, mutual empathy, and reading other's emotions. Logically and as expected, women select professions that fit their natural interests and strengths and that give them more satisfaction in the workplace and comparative advantages over men. Just as the Department of Labor Study reported "...numerous factors contribute to the gender wage gap. Many of the factors relate to differences in choices and behavior of women and men in balancing their work, personal, and family lives. These factors include ... occupations and industries in which they work, and their human capital development, work experience, career interruptions and motherhood."

All men and women should have equal opportunity and encouragement to pursue any career paths they decide on, but different genders, as a population, will select different career paths due to the hard wiring of their brains and subsequent social reinforcement. Thus, a wage gap between men and women will continue due to the wonderful, inherent differences between the genders. The wage gap is less the result of discrimination than to innate, natural differences. These differences may not be easy for people to learn, to understand and to accept, and unfortunately many advocates may not cease claiming sexual discrimination. It is easy to answer, "Why are there no women playing in the NFL or NBA?" In this case, everyone easily observes and understands the differences in athleticism and body structure between the genders. Understanding the inherent differences, as a population, between men and women's personalities, abilities, preferences and motivations as they influence career paths and life decisions is clearly not as obvious but is unquestionably as true and inherent as the sports analogy.