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Examining Gender Differences in Academia

One of the most controversial topics in our present world is the role of women in society. This has been a particularly hot topic in the sciences. One of the many questions researchers are investigating is why so few women pursue careers in science and engineering. Larry Summers, former president of Harvard University, in a 2005 speech depicted his three “hypotheses” to explain the lack of gender balance:

The first is what I call the high-powered job hypothesis. The second is what I would call different availability of aptitude at the high end, and the third is what I would call different socialization and patterns of discrimination in a search (Summers).

In his speech, Summers goes on to explain his three hypotheses in the above order, which he claims is the order in which they rank in terms of importance. Many of his arguments are dangerous arguments to present, particularly without substantial evidence, due to the steadfast fragility of the topic he chooses to address. While the points he tries to make are not completely unreasonable, his arguments are poorly presented and at times grossly exaggerated or supported with irrelevant anecdotes.

Summers’ “high-powered job hypothesis” states that few women have the time or desire to work an 80-hour week. He explains that men are often better prepared to make such a commitment, and the women that do pursue such high-powered careers often have no children and are unmarried. Londa Schiebinger, the Barbara D. Finberg Director of the Institute for Research on Women and Gender and professor of the history of science at Stanford University cites, “43 percent of married female physicists are married to other

physicists, whereas only 6 percent of male physicists have physicist spouses” (Johnston). Schiebinger goes on to explain that many women pursuing high-powered careers marry men pursuing high-powered careers, and this limits advancement and mobility for one of the couple. Oftentimes the woman’s career is the one that is sacrificed. In that way, Summers is not far off with his first hypothesis.

Summers’ second hypothesis, “different availability of aptitude at the high end,” is the striking hypothesis that received the majority of the country’s criticism. He uses vague terminology to explain his process in doing “a very crude calculation.” Summers explains that men on average do better in math and science than women in standardized testing, and uses this to support the idea that men are innately better at science and math than are women. Jo Boaler, an associate professor of mathematics education at Stanford’s School of Education argues, “There is a huge belief that boys are better at math which is vastly out of proportion to any data that we have” (Johnston). Furthermore, poor mathematical proficiency exemplified by the majority of women comes much more from social pressures that steer women away from more difficult math courses. Physicists involved in a study conducted at University of Colorado at Boulder noted, “Women generally enter college less prepared for college physics courses than men”(ScienceDaily). The researchers found that a simple self-affirming values exercise removed some of the anxiety created by social expectations and stereotypes so that women could better succeed in their introductory physics courses.

That brings me to Summers’ third hypothesis: “different socialization and patterns of discrimination in a search.” Summer’s says, “Most of what we’ve learned from empirical psychology in the last fifteen years has been that people naturally attribute things to

socialization that are in fact not attributable to socialization.” Thus, the majority of his argument here is that far too much weight is put on the idea that socialization is the sole reason for the gender gap. I agree with him that there is never one single cause for anything. It is most often a number of causes that culminate in one effect. The biggest error both sides of this conflict make is having a black and white state of mind.

Radical feminists will often try to claim that men and women are equal in every way and thus should be received equally in all facets of life. Obviously, I do not completely disagree with this statement. I, as a woman in physics, am particularly grateful for the choices I have and of course believe I deserve at the very least an equal salary. However, there is irrefutable evidence that men and women are biologically different. Summers is right to say that little girls will more often show a nurturing side in their play, no matter what toy they are given. The issue is not to argue whether men and women are different. More importantly, a nurturing personality has nothing to do with whether any student, male or female, might succeed in science.

In the same study conducted at CU-Boulder, researchers explored why on average women perform more poorly than men in introductory physics courses. Physics professors had students in an intro physics class write on important values such as friends, family, learning, or music once at the beginning of the semester and again the week before their first midterm exam. The majority of the female students raised their grades from the “C” to “B” range and also demonstrated greater mastery over the material in general. Researchers conducted the study with a random group of 399 students. Half of the students were given a list of values and told to write about those that were most important to them. Those students were designated the “test” group. Students in the “control” group

were given a list of values and told to select values that were least important to them and write about why those values might be important to other people. Significant improvement was noted in women in the test group. The most improvement was noted in female students that on a previous questionnaire agreed with the statement, "According to my own personal beliefs, I expect men to generally do better in physics than women." Men's grades, on the other hand, were not substantially affected one way or the other (ScienceDaily).

CU-Boulder's study offers a significant finding in education. This group of students wrote on a subject that had nothing to do with physics, and everything to do with societal pressures and expectations. That means that in spite of Summers' qualms with the socialization theory, it is a very important factor in why women don't as often pursue careers in the sciences. Lead author on the study, Dr. Akira Miyake, commented in a *ScienceDaily* article, "I just wasn't expecting this kind of finding. They're already interested in these things and are highly motivated to do well in that course." All of the students were STEM majors—Science, Technology, Engineering, and Mathematics—and still benefitted from the simple writing exercise. I personally can attest to the fact that choosing a career path in a predominantly male field is quite intimidating. I took my first physics class in ninth grade and immediately loved it. This was a class required for all students. My next opportunity at a course was AP Physics in twelfth grade. There were five girls in the class, including myself, and around thirteen guys. I found myself actually questioning whether men's brains are naturally better structured to understand science, and by the time I arrived in college I decided I was not smart enough to do physics.

Second semester of freshmen year I decided to take Calculus to satisfy my computational graduation requirement. My professor assigned the class a pre-calculus assignment to complete before the semester began and I found myself whizzing through the assignment as if I were simply writing my name over and over again. In fact, the class was so easy for me that I decided to add physics as a fifth class to keep myself busy. Furthermore, the physics professor allowed me to sign up for Physics II, even though I hadn't taken Physics I and I had not done well enough in AP Physics to be exempt from either. It was in this Physics II class that I realized science, in particular physics, comes easily to few. Those who pursue science, often do so due to interest more than ease of content, and this applies broadly over all genders. When I decided to become a physics major it was because I realized that the reason I struggled with the material is simply because it's hard. I realized that if I really wanted to do physics I could do it.

Substantial progress has been made in the US since the start of the women's movement. Women make up more than half of students seeking degrees in life sciences, nearly half of students seeking bachelors' degrees in math, and are well represented in agricultural sciences, chemistry, and geosciences. On the other hand, women are significantly underrepresented in physics, computer science and engineering. As of 2007, women make up 35 percent of students earning degrees in chemical engineering and 14 percent in electrical engineering. Only a quarter of women pursue undergraduate degrees in physics and the number of women pursuing degrees in computer science has declined since the 1980's. Furthermore, men outnumber women 73 percent to 27 percent overall in science and engineering careers (De Welde). Therefore, while there is significant evidence to support our progress as a society, the underrepresentation of women in the sciences

needs to continue to be addressed. The importance of encouraging women to pursue their dreams, no matter what they may be, cannot be overlooked.

My issue with Larry Summers' speech is how harmful it could be to students trying to figure out what they want to do with their lives. There are substantial innate gender differences that one must take into consideration but it appears that some innate inclinations are stifled by socialization. In order to foster this innate potential, human beings need to learn to look inside themselves, and Summers' provocation only serves to strengthen the barriers constructed by society. An equal number of men and women in every area of study should not necessarily be the goal. It is about making every subject equally comfortable for every type of person, so that social pressures can't cause a student to major in something different than he or she desires. Anyone should be able to pursue any career he or she chooses without discrimination.

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