

# The Pink and the Blue

## *Separating Myth from Fact in Gender Research*

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### **Abstract**

Sex and gender are different, yet related, concepts. Sex is the anatomical assignment given at birth, whereas gender is a social and cultural construction of identity. What are the facts and myths related to gender, and how are these changing? More importantly, how do these facts and myths influence the outcomes related to students' achievement levels? This article explores these topics and provides strategies for educators to use in the classroom to encourage all students to succeed.

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## **1 Introduction**

Our understanding of issues related to sex and gender is undergoing a profound change. For many years, researchers understood sex to be a fixed and unchanging physical concept—something that is assigned at birth based on anatomical differences. Gender, the psycho-social identification with one sex or another, was assumed to match anatomy. However, the emergence of the struggles of transgender individuals has revealed relative fluidity of the notion of gender. We can no longer accept gender as assigned at birth; rather, we now need to evaluate how we think about gender, and through this evaluation sift through the facts and myths of what it means to be a man or a woman.

## **2 Myths vs. Facts**

Gender myths are deep and pervasive. One has only to view older advertisements from the 1950s to see some popular myths at the time—the notion that women should be attractive, less intelligent, utilitarian, and subservient to men. These images portray a stark reality about fixed gender roles from this era. Today's ideas about men and women are more subtle – but they are still present. For example, images on popular magazine covers question successful women, for example, or they portray men as boorish and taking their power and status for granted. Therefore, gender myths are still be present in our societies, and so it is important to understand these myths and which of them are rooted in reality for the male and female students that we teach.

Some troubling facts that are not myths relate to women and their status in the world, which is generally lower than the status of their male counterparts. For example, women account for 70% of the population living in real poverty, and of the world's nearly one billion illiterate adults, two-thirds are women. Although women's rates of success at any undertaking vary tremendously by region, overall it is much less likely that women will succeed at rates comparable to men, and this pattern is true in a variety of areas. For example, men still earn more than women in OECD nations, and they achieve poorer scores on a number of different exams such as the Scholastic Aptitude Test (SAT). At high levels of achievement, the pattern persists. For example, through 2014, only 47 women out of 889 recipients were awarded the Nobel Prize and the Prize in Economic Sciences. Men are nine times more likely to become the head of a corporation than women. Women's sports offer far less prize money than do men's sports. It is important to consider what may be causing these real gender gaps.

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Men and women tend to go into different career fields, especially in science and mathematics. Specifically, more men enter fields related to mathematics, computer science and physics than do women, and these fields may open doors to high-paying careers. When men enter careers, they tend to persist longer and achieve higher ranks. Two major theories have been put forth as possible explanations for the disparities in interest and achievement between men and women: the biological explanation and the socio-cultural explanation.

### 3 Two Explanations

The biological explanation suggests that differences in interest and levels of achievement between men and women may be due to brain-based differences in ability. These differences, researchers argue, have evolved over time due to evolutionary patterns. Men tended to be hunters, while women tended to be the ones who reared young and gathered food. These patterns may have caused cognitive differences to emerge.

These cognitive differences include abilities that are related to intelligence quotient (IQ). We know that there is a theoretical normal distribution of these abilities among the general population; IQ scores are composite scores of these abilities, and an average IQ score is 100, with a standard deviation of 15. However, we also know that more boys and men are located at the extreme tails of the curve – high end and low end – which means that there tend to be more men than women with extremely high and extremely low IQs. Girls or women tend to have better verbal abilities, although interestingly, girls' verbal abilities are not evidenced on the Scholastic Aptitude Test (SAT) that most American students must take for entry into university – boys have outperformed girls on the verbal portion of this test for four decades. Another difference is that boys tend to have better visual/spatial abilities. For example, boys do demonstrably better on tasks that require the mental rotation of an object, which may explain in part why more boys enter fields such as engineering. However, it is important to remember that these cognitive differences are small and are most apparent at the extremes. Overall, boys and girls are more similar than they are different.

Social and cultural differences have also been offered as an explanation for gender disparities. Gender stereotypes are all around us, and much research has been conducted that suggest their powerful influence. For example, Condry and Condry (1976) conducted a study in which they asked university students to watch a video of a baby who was startled by a jack-in-the-box. Half of the students were told that the baby was a boy, and half were told that the baby was a girl. Students who believed that the baby was a boy were more likely to interpret the baby's reaction as anger, whereas students who believed that the baby was a girl were more likely to interpret the reaction as fear. Traditional gender stereotypes reinforce the notion that women should be nurturing, submissive, passive, emotional, kind, and more. Men should be dominant, aggressive, independent, logical analytical, and more. Martin and Halverson (1981) suggested that these stereotypes help individuals organize information, and Eccles et al. (2000) found that children are judged differently based on these stereotypes.

### 4 Strategies for the Classroom

Understanding the reasons for the differences allows us to take a nuanced approach when considering how to best educate the boys and girls in our classrooms. For example, in the primary grades, we know that the differences between boys and girls in terms of interests and abilities are less pronounced than they later become. In part, this may be due to the fact that gender roles are still fluid at this stage. It is not unusual to see kindergarten students playing at different roles, with girls taking on the role of the father and boys the mother. Girls are as interested in science at this age, as they eagerly explore their worlds.

By the middle grades, we often see a reversal of this situation. That is, boys and girls begin to take on firmer gender roles—they may play separately, and frequently eschew the opposite gender's interest patterns, especially in science and mathematics. We often see a decline in interest in school, and depression may set in. Many girls go quiet in the classroom. In short, students may establish patterns that could ultimately culminate in a life-long disparity in selection of careers and achievement levels.

How can we, as educators, encourage boys and girls to take an interest in a wide-range of opportunities and nurture their interests and talents in the classroom? One recommendation is to teach students that abilities are malleable. Much research, including the work of Carol Dweck, centers on this idea, which is to teach students that IQ and abilities change over time. If students believe that abilities are fixed and cannot change,

they have no impetus to change if they do poorly in a subject. This idea is particularly troubling with women, whose interests and talents in mathematics may shut down when they first do poorly, because they may believe that they lack ability in the area.

Another related recommendation is to provide specific feedback related to effort rather than ability. Examples of feedback related to effort include, “I can tell that you worked hard on this,” or “You may need to work harder to achieve a higher grade next time.” Examples of feedback related to abilities include, “You are really good at science!” or “Maybe math isn’t your thing.” By praising effort, we affirm that abilities are malleable and may improve over time. We also reinforce the notion that success is related to effort, which is under the student’s control, rather than to ability.

A third recommendation is to provide high interest reading materials. Reading is most certainly a gateway to interest areas for many students, yet we frequently provide only state-approved textbooks or other dry curricula and do not encourage exploration of a wide variety of materials. Encouraging students to develop and establish their own reading interests, and bringing a wide selection of books, magazines, journals, newspapers, and more into the classroom allow for this exploration. It is particularly important to have a selection of highly readable and interesting materials in science and mathematics that students may access.

In addition to exposing students to a variety of reading material, it is important to expose children to books and speakers that challenge gender assumptions. Doing so may encourage students to break out of traditional gender roles in terms of interests and beliefs about abilities. Examples of such books include *Goblinheart: A Fairy Tale*, by Brett Axle, and *Do Princesses Scrape Their Knees?* by Carmela LaVigna, Colye. Exposing children to role models in the form of speakers who challenge gender roles can also help. For example, inviting female firefighters or male nurses in to speak during career day will familiarize students with the understanding that careers need not be gender-specific.

Interesting students in advanced technology by using it in our classrooms may create a life-long interest in a technology-based career. Asking students to listen to or create podcasts, use apps for or mobile devices, and more will engage students and educate them in such a way as to make them better prepared for using future technology. Similarly, providing students with manipulatives that increase their spatial awareness may open their eyes to careers in fields such as engineering and mathematics. Blocks, legos, origami, puzzles, virtual building simulations, and more afford students opportunities to construct, to build, and to develop this ability to manipulate and construct.

Dealing with gender as a fluid concept may also be important to developing students’ ability to be flexible in terms of gender roles. Disabusing students of the notion that boys’ brains are better suited to mathematics and science, and girls’ brains are more suited to language and writing is the first step. Pointing out students’ success in opposite areas, such as when boys do well on a writing assignment or when girls excel at mathematics, may be helpful. Discussing transgender issues openly and honestly with students as the need arises may also demonstrate that gender is not necessarily something we are assigned at birth.

## 5 Conclusion

In conclusion, boys and girls are assigned their sex—determined by their physical anatomy—at birth. However, the assignment of sex is now open to question as more transgender individuals are openly discussing how they feel that their gender does not match who they are physically. Children begin life with fairly fluid gender roles, but as they age, these roles become more prescribed and fixed. The influence of these roles, along with some minor cognitive differences in ability between the sexes, may account for different interests and achievement levels as these children become adults. As educators, we can nurture all children and encourage them to follow their true interests and abilities, wherever they may lead.

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