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GENDER DIFFERENCES IN GIFTED CHILDREN

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Research studies that address questions pertaining to significant differences between gifted boys and girls range from teachers' stereotypes that influence identification and nominations for advanced programs (Barber & Torney-Purta, 2008) to an examination of external and internal factors contributing to eventual achievement (Reis, 2002). Do differences in achievement among gifted boys and girls still exist? Do gifted girls still fail to realize their potentials in adulthood? Are gifted boys still limited in their career choices because of sex-role stereotypes? This chapter explores the social and emotional factors that are reported to influence gifted girls' and boys' achievement and success.

MAJOR FINDINGS GENDER DIFFERENCES IN STEM PATHWAYS

Earlier research studies seemed to suggest that innate gender differences in aptitudes for the "hard" sciences is being overturned.

Freeman (2004) reported that gifted girls in Britain were surpassing those of gifted boys in almost all areas of study across various ages. This was attributed to two factors: British girls are believed to demonstrate greater confidence in their abilities, and British curriculum and assessment incorporate styles and contents such as extended prose, written portfolios, and research projects that encourage female study patterns. However, more recent studies indicate this view may have been unstable. A 5-year United Kingdom study of more than 19,000 participants found that only 15% of 10–14 year-olds sought STEM subjects as a career (ASPIRES, 2013). Science was found to be socially constructed, in that teachers often favored boys, perceiving them to be more naturally able, even when girls' school marks were higher.

More recent investigations in the United States, however, show a different picture, with gifted males consistently outperforming gifted females on STEM subjects and nonverbal assessments by as much as 3 to 1. Conversely, gifted females outperform males on verbal tests by a ratio of 2 to 1 (Heilbronner, 2013; Olszewski-Kubilius & Lee, 2011). The 2007 administration of TIMSS also demonstrates a pronounced gender difference with eighth-grade boys significantly outperforming eighth-grade girls, with the United States exhibiting the largest gender gap (Institute of Educational Sciences, 2009).

Stoet and Geary (2013) analyzed 10 years of data from the Programme for International Student Assessment (PISA) to determine gender differences in mathematics and reading performance of nearly 1.5 million 15 year-olds in 17 countries across four PISA assessments

(those in 2000, 2003, 2006, 2009). Overall, boys are found to score higher than girls in mathematics, but lower than girls in reading. Although there are countries where girls are found to score higher than boys, the researchers also stated that they found no evidence supporting that sex differences were in any way related to the gender equality indicators of particular nations.

Although gifted boys are found to sacrifice deeper understanding for correct answers achieved quickly (Boaler, William, & Brown, 2000), gifted girls are found to react less positively than boys to pace, pressure, and competitiveness, often wanting time to think and discuss their understanding. In Israel, interviews with Advanced Placement Physics students showed that the girls did not like excessive competitiveness, aiming instead for deep understanding and connected knowledge (Zohar & Sela, 2003).

ATTRIBUTIONS OF SUCCESS

Callahan and Hébert (2014)'s critical analysis of the literature showed differences among gifted males and females when it comes to general attributions of success and specific discipline attribution. Generally, gifted boys attribute academic success to ability and failures to a lack of effort (Hébert & Schreiber, 2010). Interestingly, while earlier research studies found that academically talented girls attribute their success to hard work or luck and failures to lack of ability, these findings are contradicted by a more recent study (Assouline, Colangelo, Ihrig, & Forstadt, 2006). Gifted girls are now found to attribute failure to not working hard enough rather than a lack in knowledge or skills. Specific discipline attributions likewise exist with gifted boys regarding themselves as having higher ability in math and sciences whereas gifted girls regard themselves to be of higher ability in language arts and the humanities (Rudasill & Callahan, 2010), regardless of their actual abilities and performance in these areas (Tirri & Nokelainen, 2011). This is likewise evident with a sample of Finnish Mathematics Olympians (Tirri & Nokelainen, 2011) and gifted sixth-grade girls from Germany who demonstrated lower levels of self-concept and interest in mathematics compared to gifted boys (Preckel, Goetz, Pekrun, & Kleine, 2008).

Rudasill and Callahan (2010) noted that boys' lower self-perceptions of their abilities in the humanities may consequently limit their career options. The research findings revealed that self-perceptions correlated with future coursework plans, with females anticipating taking fewer math and science courses despite the fact that both males and females perform equally well on assessments of math ability. This is based on annual cognitive state assessments for grades 2 to 11 across 10 states in the U.S., believed to be representative of all 50 states based on their average scores on the National Assessment of Educational Progress (NAEP; Hyde, Lindberg, Linn, Ellis, & Williams, 2008).

MULTICULTURAL DIFFERENCES

Research that ignores cultural effects on self-concept and motivation can distort developmental understanding and conclusions drawn for practice. Thus, it becomes imperative to examine empirical findings coming from different cultural backgrounds. There are now research studies that look into culturally different gifted communities, such as how home environments influence gifted children's creativity across gender in Saudi Arabia (Hein, Tan, Aljughaiman, & Grigorenko, 2014) and a comparison of Dabrowski's overexcitabilities by

gender for American and Korean high school gifted students (Piiro, Montgomery, & May, 2008).

Research studies coming from culturally different backgrounds likewise demonstrate different realities when it comes to self-concept and achievement across gender. In Singapore, being academically competent and problem-focused appeared to be more important in defining the self-worth of intellectually gifted girls than boys. Gifted girls in Singapore also tended to be less reliant on social support than male counterparts in coping with school concerns (Huan, Yeo, Ang, & Chong, 2012). This is supported in Kao's (2011) study of nine mathematically gifted female adolescents from Taiwan with their proclivity for aloneness, indifference to popularity, and greater attachment to family than to friends.

This sense of pride in one's intelligence regardless of gender is likewise seen in a sample of 22 intellectually gifted boys and girls from the Philippines (Garces-Bacsal, 2011) as well as gifted African American collegiate males who made no attempts to minimize their intelligence despite their being in a predominantly White university (Hébert, 2002).

Gifted male achievement also needs to be understood from within a cultural context. Kao and Hébert (2006) pointed out that Asian American parents may have differing attitudes toward education and place an overemphasis on academic achievement that may result in intergenerational cultural conflict. In Whiting's study (2009) on gifted African American males, he noted that additional barriers exist among Black males identified as gifted who find their identities, self-efficacy, and self-esteem in limited domains such as sports, music, and acting.

GROWING INTO ADULTHOOD: WHOSE WORLD IS IT AND WHO RULES IT?

Freeman (2010) has made an in-depth investigation into influences affecting gifted children (aged 5-10) into middle age, described in her 35 year comparison study of 210 gifted and nongifted children across Britain. Findings reveal that in terms of conventional success in life, such as high examination marks, climbing the corporate ladder, or making money, the primary building blocks were always keenness and hard work, allied with sufficient potential, educational opportunity and an emotionally supportive home. Some gifted girls were subject to the handicaps of parental assumptions.

A more nuanced understanding of gifted females' involvement in the sciences indicates that while women earned more doctoral degrees than men in fields such as biology, gifted women are still underrepresented in fields such as engineering and computer science (National Science Foundation, 2011). However, at work they earned less than men. This is evident among the 145 Presidential Scholars from 1964– 1968 who were interviewed 40 years later, with a higher percentage of gifted men earning more than the women (Kaufmann & Matthews, 2012). The researchers noted that despite this income difference, a greater overall satisfaction with income was reported by women than by men. In Reis's (2005) qualitative study, she noted that females seek careers that they believe to be of significance to society and where personally satisfying relationships are instrumental to success. Although high in personal meaning and societal contribution, these are not typically highly compensated positions. This is even more clearly shown in Willard-Holt's (2008) study of 18 female teachers identified as gifted. Conversations with the respondents revealed that they received more numerous and empathic

messages of discouragement about their career choice (“You could be doing brain surgery”) than messages of encouragement. Yet despite this, they remained committed teachers with their perceptions of achieving both intellectual challenge and emotional self-actualization in their careers.

Tirri and Koro-Ljungberg’s (2002) investigation of the critical incidents among gifted female Finnish scientists revealed that while some compromises related to their scientific identity in male-dominated science professions were inevitable, this did not prevent them from realizing their talents. Female Academy of Finland professors and Olympians also cited having a supportive spouse as among the most important choices they made in their lives and hiring outside help at home as particularly helpful in allowing them to manage both career and family life.

In a qualitative study (Hébert, Pagnani, & Hammond, 2009) of 10 prominent gifted men born between 1946 and 1964, positive paternal influence was an instrumental factor in their talent development. Six important themes also emerged as significant among men who achieved success in various fields such as sports, music, public service, humanities, and the arts: unconditional belief in son, strong work ethic, encouragement and guidance, maintaining high expectations, pride in son’s accomplishments, and mutual admiration and respect.

The question then of whose world it is and who rules it seems moot with research indicating gifted girls and gifted boys to be more alike than they are different (Kerr, Vuyk, & Rea, 2012). However, gendered educational practices (as seen in the insistence on athletic activities for boys at the expense of academic activities or overprotection of girls when it comes to participation in afterschool and summer programs) and differing societal expectations exacerbate such dualities. This may contribute to long-term consequences in connection to life choices, career aspirations, and eventual accomplishments (Kerr et al., 2012).

CONSIDERATIONS AND IMPLICATIONS FOR RESEARCHERS AND PRACTITIONERS

The scientific evidence has long shown there is no simple nature-nurture divide between the genders (Freeman, 2005). Striving and reaching for excellence emerges in individuals from their aptitudes affected by family and cultural life. Children’s cognitive styles (as seen in the ability to think systematically and logically or in being driven by emotions) are not a product of genes, but a mixture of experience and cultural pressures filtered by personality and an early start in life.

A more systematic look into how culture shapes gender stereotypes (e.g., Latino communities, Asian contextual realities), which then influence career aspirations and choices in life for gifted men and women has yet to be conducted. Callahan and Hébert (2014) posited that clear and consistent lines of research underlying variables contributing to male and female achievement, as well as empirically defensible best practices are needed. The authors also observed a reliance on qualitative studies and called for more quantitative studies that explore gender differences on achievement. Kitano (2008) pointed out that having comparison groups (of gifted males/females, average males/females) and controlling for differences in socioeconomic status between groups, would also be helpful in examining essentially unique characteristics among bright young people.

Educators and practitioners should also note that gendered practices are found to exist in gifted education (Kerr et al., 2012). These refer to unconscious practices of teachers that eventually result in differing outcomes for gifted girls and boys. Gifted African American and Latina females (Kitano, 2008) and gifted African American males (Bonner, Lewis, Bowman-Perrott, Hill-Jackson, & James, 2009) continue to be significantly underserved in programs for the gifted. Bonner et al. (2009) noted that researchers and practitioners need to be sensitive to a “unique alchemy” of identity, gender, and culture that may potentially influence gifted students’ success in school.

Ford and Moore (2013) recommended that educators adopt a social justice approach to their work. This means having a culturally responsive approach in philosophy and classroom action to close the achievement gap among African American students and gifted Black males in particular. Grantham (2011) called for more upstanders (those who engage in proactive roles to address injustices) to prevent the bystander effect, which allows gifted Black males to be overlooked for or drop out of gifted programs. A scholar identity model is also proposed by Whiting (2009) to support the process of image building among gifted Black males.

Teachers should also help gifted students realize that school achievement is not life achievement and that gifted and talented students should be given opportunities in a broad range of career fields regardless of gender. Although there is a need for teachers to encourage gifted girls in math, science, and technology (Reis & Graham, 2005), the girls also should not be made to feel that careers in the humanities and the arts are not good enough for them. Kao (2011) also pointed out that teachers should respect gifted girls’ proclivity for aloneness by not forcing them to play in groups and being mindful of forming peer groups that have similar interests in values rather than simply forming age-appropriate groups.

Kitano (2008) noted that gifted boys report less psychological androgyny than gifted girls in terms of personality, which can adversely affect boys’ future career prospects. Psychological androgyny consistently has been found to be a marked characteristic of creative individuals (Csikszentmihalyi, 1996) and allows gifted males to embrace their sense of *being* more fully and that this need not diminish their identity as men. Psychological androgyny could also serve to empower gifted females to pursue career pathways that they may perceive to be male-dominated, as well as allow them to embrace the challenge of being both homemaker and a career-driven individual. It becomes increasingly important, then, to view gifted boys and girls as gifted *individuals* or bright young people rather than overly emphasize male-female dualities.

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