

Gender differences in academic achievement: The mediating role of personality

Renato Gil Gomes Carvalho

Centro de Investigação em Ciência Psicológica da Universidade de Lisboa (CICPSI), Faculdade de Psicologia, Alameda da Universidade, 1649-013 Lisboa, Portugal



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ABSTRACT

Research has shown pervasive gender differences in academic achievement. Because both genders present similar global intellectual ability levels, interest has arisen concerning the role of non-intellectual factors in explaining these differences. In this study, the mediating role of personality dimensions related to disconstraint and aggressiveness, in the relationship between gender and academic achievement is assessed. The sample consists of 351 adolescents, ranging in age from 14 to 18 years old. The instruments are the aggressiveness and disconstraint PSY-5 dimensions of the MMPI-A and the School Life Survey (SLS). MANOVA shows that females report better indicators of achievement, the frequency of behavioral problems and overall satisfaction. Regression analyses using bootstrapping procedures reveal the full mediation effects of disconstraint, but not of aggressiveness, on the influence of gender on achievement. The results are discussed in light of the role of disconstraint-related personality characteristics for academic success and the potential factors underlying gender variability in these characteristics.

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Research has shown pervasive gender differences in academic achievement. Despite the same general intellectual ability, females are reported to outperform their male counterparts (Steinmayr & Spinath, 2008), which has sparked interest in relation to understanding the factors underlying this pattern, namely, those of that are non-intellectual in nature. Among the factors that have been associated with students' success throughout schooling, personality has been assuming a prominent role, as it predicts motivation and willingness to perform a task, engagement in non-academic activities, attitudes with regard to studying and approaches to learning (Chamorro-Premuzic & Furnham, 2008; Komaraju, Karau, & Schmeck, 2009; Willingham, Pollack, & Lewis, 2002). Because personality is associated with a wide range of adaptive behaviors in the school context that ultimately lead to academic success, one can discuss whether gender differences in achievement are related to gender differences in terms of personality. This hypothesis is particularly relevant considering specific personality dimensions related to impulse control, namely disconstraint and aggressiveness, in which females score moderately lower than males (Duckworth et al., 2015; Steinmayr & Spinath, 2008). In fact, increasing evidence has shown that one of the hypotheses for boys being at greater risk for academic achievement difficulties involves gender differences in the sphere of behavioral self-regulation (Gestsdottir et al., 2014). Hence, and as in previous studies (Duckworth & Seligman, 2006), this study seeks to determine whether disconstraint and aggressiveness play a relevant role in explaining the gender differences in academic achievement, as reported by the students. This study specifically analyzes the mediating

role of those personality structural dimensions in the effect of gender on achievement; therefore, it has provided further insight into the factors underlying distinct patterns of gender success at school.

1. Gender differences in academic achievement

General statistics in education show that females outperform males at different stages in the school system, have better grades, and reach post-school qualifications in higher numbers (Gibb, Fergusson, & Horwood, 2008; Matthews, Morrison, & Ponitz, 2009; Voyer & Voyer, 2014). This pattern persists after controlling for students' backgrounds, namely, their socioeconomic circumstances (Matthews et al., 2009). These indicators have garnered attention for the so-called gender gap in educational attainment, not only from psychological sciences but also from the general public (e.g., in newspapers articles such as "The weaker sex—Boys are being outclassed by girls at both school and university, and the gap is widening" (The Economist, March, 7th, 2015). Given the impact of academic achievement on individuals' adaptability and the concern about inequalities in school contexts (Wach, Spengler, Gottschling, & Spinath, 2015), which influence public policies, understanding the reasons for gender differences in this domain corresponds with a prominent issue that needs to be addressed.

When identifying the predictors of academic performance, intellectual ability frequently arises as one of the most effective predictors across a wide spectrum of domains and criteria (Fischer, Schult, & Hell, 2013a; Steinmayr & Spinath, 2008). However, no significant associations between gender and intelligence have been found (Fischer et al., 2013a; Gibb et al., 2008), despite reported indicators of gender

E-mail address: renatoggc@gmail.com.

differences in specific domains, such as females scoring higher in verbal tests and males scoring higher in visuospatial tests (Steinmayr & Spinath, 2008; Strand, Deary, & Smith, 2006; Voyer & Voyer, 2014; Wach et al., 2015). Because males and females have similar overall intelligence levels, looking beyond the concept of ability may be an effective approach to understand why females generally have better school grades (Fischer, Schult, & Hell, 2013b; Strand et al., 2006; Voyer & Voyer, 2014). While some biological correlates, such as brain organization, have been considered relevant to gender differences in achievement (Gibb et al., 2008), the role of personality traits and behavioral dimensions related to externalization has been increasingly considered. The gender differences in these dimensions that result, for instance, from dissimilar patterns of academic and social expectations for males and females (Voyer & Voyer, 2014), as well as from influences of socialization in the formation of gendered behaviors accordingly with the cultural norms for masculinity and femininity (Gibb et al., 2008), may cause different patterns of school behaviors and, consequently, also different patterns of achievement.

2. Gender, personality, and academic achievement

Personality traits are among the most prominent non-intellectual dimensions that account for variance in academic achievement, perhaps even more than intelligence can (Bratko, Chamorro-Premuzic, & Saks, 2006; Kappe & van der Flier, 2012). In two meta-analyses regarding the relation between personality and academic achievement, Poropat (2009, 2014) demonstrates that conscientiousness, one of the first-order traits of the five-factor model (FFM; Costa & McCrae, 1992), and which involves facets such as competence, order, dutifulness, achievement striving, self-discipline and deliberation, is systematically linked to achievement at different education levels; it also presents levels of validity that are similar to those of intelligence. As Kappe and van der Flier (2012, p.615) state, “conscientious individuals perform better because they persevere longer and are more organized than their counterparts”.

Given that personality is related to academic achievement, a hypothesis for the gender differences in achievement also relies on existing gender differences in personality (Hicks, Johnson, Iacono, & McGue, 2008). This assumption is corroborated by the literature, which shows that females' lower scores in disinhibition-related personality characteristics, including their ability to focus their attention, manage their behavior and consciously suppress impulses for the sake of higher goals, predict better educational experiences and outcomes (Duckworth & Seligman, 2006; Duckworth et al., 2015; Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006; Fischer et al., 2013a; Matthews et al., 2009; Steinmayr & Spinath, 2008). For instance, Duckworth and Seligman (2006) found that self-discipline partially mediates the relationship between gender and GPA. This finding was replicated in a recent study, in which Duckworth et al. (2015) confirmed the hypothesis that self-control mediates the relationship between gender and GPA. Fischer et al. (2013b) add that achievement motivation, which is expressed through diligent behavior and can be analyzed in the sphere of the ability to manage impulses, can help females obtain better grades.

These gender differences in non-intellectual dimensions can be expressed as early as those in temperament and activity levels, as Else-Quest et al. (2006) indicate; they show that a female advantage in effortful control and a male advantage in surgency can ultimately be reflected in behavior at school. Gibb et al. (2008) also show that teachers report that boys, compared with girls, are prone to inattentive and restless behaviors and aggressive and oppositional behaviors. Given the strong negative correlation of externalizing behavior with academic achievement (Hicks et al., 2008), boys can thus be at higher risk, for instance, by being more likely candidates for disciplinary measures, such as suspensions and expulsions, and school dropout (Matthews et al., 2009).

Based on the previously mentioned research findings, which emphasize the role of gender variability in personality as a potential factor underlying gender differences in academic achievement, the following hypotheses were formulated in the present study:

Hypothesis 1. Given that personality characteristics involving the ability to manage impulses are adaptive in nature, and that males have lower mean scores in these dimensions (Duckworth & Seligman, 2006), disinhibition is expected to mediate the influence of gender on academic achievement.

Hypothesis 2. Males' higher aggressiveness is related to their lower academic achievement (Gibb et al., 2008). Thus, aggressiveness, along with disinhibition, is expected to mediate the influence of gender on achievement (Fig. 1).

3. Method

3.1. Participants

The sample, which was a convenience sample, consisted of 351 Portuguese adolescent students (212 female, approximately 60%) in the ninth through twelfth grades (equivalent to the end of mandatory school and equivalent to the end of high school, respectively). Most participants resided in rural areas ($N = 223$, approximately 64%) and their ages ranged between 14 and 18 ($M_{age} = 16$, $SD = 1.4$). Most participants were integrated into families in which the highest qualification obtained by their parents at the time of the data collection was ninth grade ($N = 167$).

3.2. Measures

3.2.1. Personality

We used the PSY-5 dimensions of the Minnesota Multiphasic Personality Inventory–Adolescent (MMPI-A; Butcher et al., 1992; Silva, Novo, Prazeres, & Pires, 2006), a self-report instrument assessing adolescents' personalities and psychopathologies. The PSY-5 dimensions of the MMPI-A correspond to a descriptive and dimensional model, based on a conceptual system of big-five factors that emphasizes specific structural dimensions or dispositional characteristics (McNulty, Harkness, Ben-Porath, & Williams, 1997). To test the present study's hypotheses, the raw results of two of these dimensions were used, namely, disinhibition and aggressiveness. Disinhibition refers to adolescents' difficulties with self-control and norm compliance as well as tendencies toward impulsive action and non-traditional morals; it consists of 24 items (Cronbach's α for this sample = .72). The aggressiveness dimension (20 items; $\alpha = .73$) reflects a tendency to experience anger, hostility and pugnacious behavior, particularly physical and instrumental aggression. Disinhibition and aggressiveness are inversely related to the conscientiousness and agreeableness dimensions, respectively, of the FFM (Archer, 2005). Beyond a convenience motive for using this instrument – given that it was being used in a research project involving

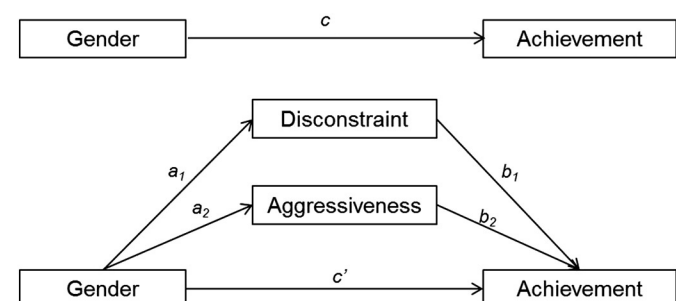


Fig. 1. Parallel mediation model hypothesized.

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