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Parental involvement and general cognitive ability as predictors of domain-specific academic achievement in early adolescence

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ABSTRACT

Numerous studies showed that general cognitive ability (GCA) is a reliable predictor of academic achievement. In addition, parental involvement in their children's academic development is of major importance in early adolescence. This study investigated the incremental validity of parental involvement over GCA in the prediction of academic performance within the domains of math and language. We examined four dimensions of perceived parental involvement: autonomy supporting behavior, emotional responsivity, structure, and achievement-oriented control. Results from a sample of 334 adolescents (*mean age* = 12.4, *SD* = .9, *range* = 10–14 years) showed that GCA was the strongest predictor of achievement in both domains. While autonomy support and emotional responsivity had no predictive value over GCA, high levels of achievement-oriented control and structure were detrimental to academic success. These findings provide new evidence for the significance of parental involvement in their children's achievement in school even after the most powerful predictor of academic success has been accounted for.

1. Introduction

Achievement in school is considered as a critical prerequisite for subsequent academic and vocational success (e.g., Jimerson, Egeland, & Teo, 1999; Schmidt & Hunter, 1998; Williamson, Appelbaum, & Epanchin, 1991). As a consequence, a lot of research has been dedicated to the identification of factors that contribute to school achievement. This research indicates that academic performance in middle childhood and adolescence is determined by a complex interplay of numerous variables. Most authors distinguish between cognitive predictors, such as general cognitive ability or working memory (e.g., Gathercole, Pickering, Knight, & Stegmann, 2004; Lu, Weber, Spinath, & Shi, 2011) and non-cognitive predictors, such as motivation (e.g., Gottfried, 1985; Gottschling, Spengler, Spinath, & Spinath, 2012; Greven, Harlaar, Kovas, Chamorro-Premuzic, & Plomin, 2009; Schicke & Fagan, 1994; Spinath, Spinath, Harlaar, & Plomin, 2006) or characteristics of the family and the school environment (e.g., Hill & Tyson, 2009; Son & Morrison, 2010). The importance of cognitive variables, particularly the role of general cognitive ability in academic success, is well documented in the literature on individual differences (e.g., Gottfredson, 2002; cf. Gustafsson & Undheim, 1996). Beyond that, the field of educational psychology has increasingly acknowledged the impact of the home environment on students' learning and developmental processes (e.g., Seginer, 2006; Son & Morrison, 2010). One particular aspect that has received increasing attention over the last years is the degree of parental involvement in their children's education (for meta-analyses see Fan & Chen, 2001; Hill & Tyson, 2009). Although this research identified parental involvement as a robust predictor of academic success, it is still an open question whether it can explain additional variance after the most powerful predictor of school achievement has been accounted for. This issue is particularly important considering that parental involvement is an influence on children's academic development that can be considered modifiable, for instance by means of counseling or intervention. Thus, identifying which types of parental involvement are particularly beneficial (or detrimental) to children's academic success is of major importance in the educational context. Therefore, the aim of our study was to integrate previous findings from research on individual differences and educational science and to investigate the incremental validity of parental involvement over general cognitive ability in the prediction of academic achievement in early adolescence.

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1.1. General cognitive ability and academic achievement

Despite the wide range of definitions of intelligence, most researchers agree that general cognitive ability is well represented by a general factor of intelligence, the *g*-factor (e.g., Jensen, 1993; Neisser et al., 1996). When it comes to academic success, there is no doubt that *g* is the single most important predictor (e.g., Deary, Strand, Smith, & Fernandez, 2007; Fraser, Walberg, Welch, & Hattie, 1987; Gottfredson, 2002; Humphreys & Stark, 2002; Kuncel, Hezlett, & Ones, 2004; Laidra, Pullmann, & Allik, 2007; Rhode & Thompson, 2007).

Regardless of the specific academic context, correlations around .50 are typically reported between measures of educational achievement and general cognitive ability (cf. Gustafsson & Undheim, 1996; Neisser et al., 1996), explaining 25% of the total variance in academic performance. The importance of general cognitive ability is also supported by the range of different achievement criteria that can be predicted by one general measure of *g*, from school achievement to academic performance in university students and vocational success in later life. Furthermore, general cognitive ability is related to a number of variables that are associated with academic success, such as socioeconomic status (SES), level of education, and income (e.g., Neisser et al., 1996).

Nevertheless, even though general cognitive ability is the most powerful individual predictor of achievement, it leaves much variance unaccounted for. Given that numerous studies pointed to the importance of parenting practices for achievement in school (for reviews see Desforges & Abouchaar, 2003; Spera, 2005), the present study focuses on one specific aspect of parenting, namely the role of parental involvement in their adolescent children's academic success.

1.2. Parental involvement and academic achievement

Parental involvement (PI) generally refers to parents' behavior at home and in school settings meant to support their children's educational progress (e.g., El Nokali, Bachman, & Votruba-Drzal, 2010; Fan & Chen, 2001; Gonzales-DeHass, Willems, & Holbein, 2005). Consistent with this rather broad definition, the term has been loosely applied to a variety of activities and the parental behavior subsumed under the construct of PI has been very heterogeneous. It ranges from parents' attendance of school activities to homework assistance and parenting styles (Gonzales-DeHass et al., 2005; Maegi, Lerkkanen, Poikkeus, Rasku-Puttonen, & Nurmi, 2011; Shumov & Miller, 2001), rendering it difficult to compare empirical findings across studies.

In an attempt to provide a classification of involvement strategies, Epstein (1987) and Comer (1995) differentiated between to two basic types of PI: *School-based* strategies, such as the communication between parents and teachers or their attendance of school events, and *home-based* strategies, such as educational activities and parental supervision, support, and reinforcement of learning at home. In their multidimensional concept Grolnick and Slowiaczek (1994) introduced three types of involvement: *Behavioral involvement* refers to both home-based and school-based involvement strategies, for instance active communication between home and school, volunteering at school, and assisting with homework. *Cognitive-intellectual* involvement reflects that parents expose their children to educationally stimulating activities and experiences, while *personal involvement* describes parental attitudes and expectations about the value and the utility of school and education. This definition of PI as a multidimensional concept not only allows the simultaneous assessment of different aspects of parental behavior, but it also facilitates the analysis of differential associations between specific components of involvement and important aspects of academic development, such as motivation and school performance (Fan & Chen, 2001; Gonzales-DeHass et al., 2005).

Over the last decade, there has been increasing interest in the role of PI for academic success in adolescence. Hill and Tyson (2009) studied the effects of different types of involvement on achievement in a meta-analytic approach that differentiated between school-based involvement, home-based involvement, and academic socialization. The latter can be mapped onto Grolnick and Slowiaczek's (1994) concept of personal involvement: It refers to parent–child communication creating an understanding for the goals and purposes of academic performance, discussing learning strategies, or communicating parental expectations for education and achievement. Results of the meta-analysis showed an overall positive relationship between PI and academic skills (cf. Jeynes, 2007; for similar results in elementary school see Fan & Chen, 2001). Interestingly, the type of involvement parents engaged in modulated this association: Whereas different types of school-based involvement were moderately related to achievement, home-based involvement was not consistently associated with achievement when it pertained to homework assistance. Other types of home-based involvement, however, were positively related to school success. Finally, academic socialization proved to be the best predictor for academic achievement. It subsumes parental behavior that supports the student's autonomy and independence, builds upon the development of internalized motivation for achievement, and provides a link between school work and future goals.

Yet, it should be noted that not all types of PI seem to foster school success. A number of studies have shown that parental control and achievement-related pressure can have detrimental effects on academic performance (e.g., Levpuscek & Zupancic, 2009; Rogers, Theule, Ryan, Adams, & Keating, 2009). In these studies, the use of commands, coercive interactions, criticism or punishment was associated with lower academic performance (e.g., Niggli, Trautwein, Schnyder, Ludtke, & Neumann, 2007; Pomerantz & Eaton, 2001), possibly because this type of behavior is perceived as over-controlling and thereby undermines the students' sense of competence and autonomy. This effect appears to be particularly strong in adolescence (Gonzales-DeHass et al., 2005).

Age-related changes in the relation between PI and academic achievement are most prominent between elementary and secondary school (Hill & Tyson, 2009; Stevenson & Baker, 1987). School-based involvement is of particular importance in the elementary school context, because parental visits to the classroom and interactions with children's teachers increase parents' knowledge about the curriculum and support the effectiveness of involvement at home (Comer, 1995; Hill & Taylor, 2004). In secondary school, however, home-based involvement plays an increasingly important role, providing assistance with homework, enhancing motivation, and structuring free time and homework time (Cooper, 1989; Fan & Chen, 2001) while promoting independence and autonomy (Desforges & Abouchaar, 2003; Hill & Tyson, 2009). This shift away from direct school-based involvement is related to changes in the children's school environment, which becomes more complex and therefore challenges the parents' ability to stay actively involved in their children's school work (e.g., Sanders & Epstein, 2000). In addition, early adolescence is associated with major developments in terms of cognition and self-concept (Adams & Berzonsky, 2003; Lerner & Steinberg, 2004). That is, adolescents are increasingly better able at integrating knowledge derived from own previous successes and failures and at coordinating the way they pursue multiple educational and personal goals (Byrnes, Miller, & Reynolds, 1999). Therefore, they are more and more able to understand how present school achievement is related to future academic success and to make decisions regarding their educational process (e.g., course selections). As the student's sense of autonomy