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Predicting children's academic achievement after the transition to first grade: A two-year longitudinal study

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ABSTRACT

The transition from kindergarten to first grade has been described as a critical period for children's academic development. Furthermore, research indicates that peer status is connected with academic adjustment, yet the underlying processes remain unclear. By means of a two-year longitudinal study during kindergarten and first grade ($N = 153$), we aimed to shed light on the antecedents of achievement at the end of first grade. Based on the parallel processes mediation model (Buhs, 2005), a comprehensive predictive model was constructed and tested. Results showed that (a) the parallel processes mediation model is partially valid during the transition from kindergarten to first grade; and (b) there is more support for an effect of academic self-concept on achievement than vice versa. This comprehensive model increases our insight in the factors that enhance children's academic development during the transition to first grade.

Introduction

In most educational systems, formal education starts around the age of six, when children move to first grade. The transition to first grade has been described as a critical period for children's development in general and their academic development in particular (Entwisle & Alexander, 1998). Not only does the child himself or herself undergo profound developmental changes (e.g., its cognitive skills), the child's learning environment changes as well. In first grade, children are exposed to more teacher-directed and seatwork activities, in a much more academically oriented environment (La Paro, Rimm-Kaufman, & Pianta, 2006; Sink, Edwards, & Weir, 2007). First grade academic performance is especially critical because of the cumulative nature of the curriculum: It is hard for children to achieve at a high level in later grades, without achieving at a high level in earlier grades. Therefore, understanding the factors that shape early achievement is important and may have implications for early mobilization of educational resources (Downer & Pianta, 2006; Ladd, Birch, & Buhs, 1999).

Recent research has focused on the effects of peer relationships on academic achievement and school adjustment processes in general (e.g., Ladd, Herald, & Kochel, 2006; Rubin, Bukowski, & Laursen, 2009). Based on these and former studies, it has become obvious that peer acceptance accounts for unique variance in children's school adjustment (e.g., Ladd, Kochenderfer, & Coleman, 1997; Lubbers, Van der Werf, Snijders, Creemers, & Kuypers, 2006). However, questions still remain about the intervening processes that may explain the link between peer relationship variables and academic outcomes (Wentzel, 2003). Contemporary research focuses on developing peer-oriented models of relationship effects on adjustment patterns (e.g., Buhs, 2005; Buhs, Ladd, & Herald, 2006; Flook, Repetti, & Ullman, 2005; Ladd et al., 1999; Lubbers et al., 2006; Wentzel, 2003; Wentzel & Caldwell, 1997). However, to our knowledge, no comprehensive, longitudinal model including peer-relationship variables has been tested regarding students' academic adjustment in *first grade*. The few studies that have examined effects of peer acceptance on first grade achievement (e.g., O'Neil, Welsh, Parke, Wang, & Strand, 1997) did not include possible intervening mechanisms. Moreover, they failed to examine effects of peer acceptance alongside of other relevant factors, such as entry factors and kindergarten achievement.

Associations between peer acceptance, self-concept, classroom engagement, and achievement: A process-oriented model

Recently, Buhs (2005) developed a process-oriented model to explain the effect of peer relationships on academic achievement, called the 'parallel processes mediation model'. This model is based on motivational frameworks, in particular the self-system model of motivational development (Connell, 1990; Connell & Wellborn, 1991; Skinner, Furrer, Marchand, & Kindermann, 2008), as well as on developmental research regarding the role of peer relationships for children's development (Coie, 1990; Harter, 1998). Central explaining processes in Buhs's model, linking peer relationships to academic

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achievement, are *academic self-concept* and *classroom engagement*. Buhs's model describes academic self-concept and classroom engagement as two mediators, acting both *linear* or sequentially (from academic self-concept to classroom engagement) and *parallel*, in explaining the link between peer acceptance and academic achievement.

Academic self-concept and classroom engagement as parallel mediating processes

To explain the mediating role of *classroom engagement* in the link between the peer relationship context and academic achievement, Buhs (2005) refers to former longitudinal studies on the consequences of early peer rejection, showing that one aspect of children's responses following peer rejection is disengagement in school activities (e.g., Buhs & Ladd, 2001). Several explanations have been provided for the negative effect of peer rejection on engagement (Buhs & Ladd, 2001; Wentzel, 2004). First, rejected children, who tend to be treated more negatively by the peer group, may withdraw from or avoid classroom activities that include abusive companions; second, rejected children may fear that the requested help will not be freely offered; and third, rejected children might believe that they will not value what their peer group values or behave as the group behaves. Positively phrased, peer provisions have the potential to influence students' internalized reasons for goal pursuit. They have the potential to make engagement in a task fun, important or interesting (Wentzel, 2004).

In its turn, classroom engagement is considered a key antecedent of academic achievement (Fredricks, Blumenfeld, & Paris, 2004). Buhs (2005) focuses on the behavioral dimension of classroom engagement and conceptualizes it as cooperative classroom participation or "children's adoption to the 'student role' and compliance with classroom social rules and expectations" (Ladd, Herald-Brown, & Reiser, 2008, p. 1002) and independent classroom participation or "children's propensity to take initiative" (Ladd et al., 2008, p. 1002). In previous longitudinal investigations, classroom participation turned out to be a significant predictor of later achievement (e.g., Ladd et al., 1999). A higher level of classroom participation represents an adaptive response to the school culture. This way, children will be more likely to have experiences that foster learning and skill development (Finn, 1993; Ladd et al., 1999). This makes classroom engagement a key intervening construct linking peer acceptance to later achievement.

To explain the mediating role of *academic self-concept* in the link between peer relationships and academic achievement, Buhs (2005) draws on Harter's (1998) ideas about the significance of peer approval or disapproval for the development of individual differences in children's self-perceptions. Empirical studies have confirmed that peer relationships are linked to several aspects of the self-concept, including academic self-concept (e.g., Boivin & Hymel, 1997; Juvonen, Nishina, & Graham, 2000; Tarquin & Cook-Cottone, 2008). This link might become more important in contemporary classrooms because peer-mediated activities (e.g., cooperative learning groups) are increasingly used to promote classroom learning and achievement (e.g., Jabionsky, 2009). In its turn, academic self-concept (or "students self-perceptions of their ability, enjoyment of, and interest in school subjects in general"; Marsh, Craven, & Debus, 1998, p. 1051) is believed to be an important aspect of the self-concept to enhance academic achievement (Harter, 1998). The contention that positive self-beliefs, and a positive academic self-concept in particular, have a favorable effect on academic achievement, even after controlling for prior levels of achievement, is central to the 'self-enhancement' hypothesis (Byrne, 1984). Increased student effort, persistence in the face of difficulties, enhanced intrinsic motivation, academic choice and coursework selection have been mentioned as mechanisms explaining this effect (Marsh, Byrne, & Yeung, 1999). Especially during school transition periods, positive self-beliefs have been found to contribute to a successful transition (Simmons & Blyth, 1987).

Academic self-concept and classroom engagement as linear mediating processes

According to Buhs (2005), academic self-concept and classroom engagement do not only operate as parallel mediating processes, each having direct links with (prior) peer relationships and (later) academic achievement. Academic self-concept is also assumed to indirectly affect academic achievement, through its effect on classroom engagement. This assumption of sequentially related processes, which mediate the link between peer relationships and academic achievement, stems from the self-system model of motivational development (Connell, 1990; Connell & Wellborn, 1991), also referred to as the 'context-self-action-outcome' model. The model affirms that interpersonal contexts shape individuals' beliefs about themselves within a particular setting, such as schools. These beliefs determine how engaged or disaffected they will be in that particular setting. Academic and behavioral adjustment form the outcomes of engagement in the educational setting. Building on this model and applying it to peer relationships, Buhs (2005) hypothesized that similar sequential linkages exist between relational features of context (peer acceptance versus rejection), aspects of self (academic self-concept), subsequent action patterns (classroom engagement), and achievement outcomes (changes in achievement).

To summarize, according to Buhs's model academic self-concept and classroom engagement are sequentially interconnected and operate as parallel mediating processes in the connection between peer acceptance and achievement outcomes.

Present study

Expanding the parallel processes mediation model explained above, we built a comprehensive model, which focuses on the transition period between kindergarten and first grade and predicts achievement level at the end of first grade from variables measured in kindergarten and during first grade, taking into account relevant entry factors (Fig. 1). The model summarizes our research goals.

Until now, the parallel processes mediation model has been tested and confirmed in a short-term longitudinal study across fifth grade (Buhs, 2005). So far, the model has only been replicated in adapted forms, omitting academic self-concept (Buhs et al., 2006; Hoglund, 2007). The first goal of the current study was to test whether the parallel processes mediation model as originally proposed by Buhs also holds in early schooling phases. Based on former longitudinal studies (e.g., Buhs & Ladd, 2001), we expected to find a mediating role of *classroom engagement* in the link between the peer relationship context and academic achievement. It is less clear whether the mediating role of *academic self-concept* and *the sequential interconnection of academic self-concept and classroom engagement* will also hold for young children (see further).

The second goal pertained to the duration of the process. Until now, Buhs's model has only been tested over short periods of time, that is, from Fall to Spring in the same school year. In our study, we wanted to test whether the model still holds over a longer period of time. More specifically, we aimed to test the validity of the model to predict achievement at the end of first grade from variables before the transition to formal education, that is, assessed during kindergarten.

Third, the parallel processes mediation model (Buhs, 2005), tested among fifth graders, proposed academic self-concept to be an antecedent of subsequent achievement (i.e., 'self-enhancement model'). Contradictorily, earlier studies among elementary school samples found support for a 'skill-development model', in which academic self-concept is a consequence of prior achievement (e.g., Skaalvik & Hagtvet, 1990). Furthermore, in a recent study with