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Academic self-concept, autonomous academic motivation, and academic achievement: Mediating and additive effects

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ABSTRACT

Three conceptual models were tested to examine the relationships among academic self-concept, autonomous academic motivation, and academic achievement. This allowed us to determine whether 1) autonomous academic motivation mediates the relation between academic self-concept and achievement, 2) academic self-concept mediates the relation between autonomous academic motivation and achievement, or 3) both motivational constructs have an additive effect on academic achievement. A total of 925 high school students (404 boys and 521 girls) were asked to complete a questionnaire on two occasions separated by a year interval. Results from SEM analyses provided good support for the hypothesized model positing that autonomous academic motivation mediates the academic self-concept–academic achievement relation. Results are discussed in light of self-determination theory and self-concept theory.

1. Introduction

The question as to whether motivation predicts student academic achievement is important in educational psychology. Interest in this issue has grown among education researchers and school professionals because student motivation can change with environmental and interpersonal factors. That is, parents, teachers, and other school professionals can create the conditions for student motivation to flourish (Reeve, 2002) and have the potential to improve their academic performance. Until now, studies on the linkages between academic motivation and academic achievement have used diverse theoretical approaches such as achievement goals (Wolters, Yu, & Pintrich, 1996), intrinsic motivation (Goldberg & Cornell, 1998), competence beliefs (Guay, Marsh, & Boivin, 2003), value attribution/control beliefs (Denissen, Zarrett, & Eccles, 2007; Stupnisky et al., 2007), and interests (Marsh, Trautwein, Lüdtke, Köller, & Baumert, 2005).

In this study, we explored two motivational factors that have repeatedly been associated with academic achievement, namely autonomous academic motivation (see Guay, Ratelle, & Chanal, 2008, for a review) and academic self-concept (see Marsh, 2007, for a review). Specifically, we examined the relations among academic self-concept, autonomous academic motivation, and academic achievement by contrasting three conceptual models. This allowed us to determine whether 1) autonomous academic motivation mediates the relation between academic self-concept and achievement, 2) academic self-concept mediates the relation between autonomous academic motivation and achievement, or 3) both constructs have additive contribution to the prediction of achievement. Testing the relations among these constructs is especially important as research on academic self-concept has developed almost independently of research on autonomous academic motivation, with few studies connecting the two constructs. In this study, we attempt to answer these questions by means of a longitudinal design using a structural equation modeling (SEM) framework. We begin by defining the constructs of academic self-concept and autonomous academic motivation. We then present three conceptual models that can explain the relations among these constructs.

1.1. Academic self-concept and achievement

Academic self-concept is an evaluative self-perception that is formed through the student's experience and interpretation of the school environment (Marsh & Craven, 1997; Shavelson, Hubner, & Stanton, 1976). Determining the direction of the relation between academic self-concept and academic achievement has been a critical issue in this field of research. Research has contrasted the self-enhancement and skill development models (Calsyn & Kenny, 1977). According to the self-enhancement model, self-concept is a determinant of academic achievement, whereas the skill development model proposes that academic self-concept is a consequence of academic achievement. In past research, these models were tested using the magnitude of cross-lagged relations to determine the *potential* causal predominance between the two variables. In other words, effect sizes of prior achievement on subsequent self-concept (in support of skill

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development models) were compared with effect sizes of prior self-concept on subsequent achievement (in support of self-enhancement models).

According to Marsh and his colleagues (see Marsh, Byrne, & Yeung, 1999) comparing these effects to support either model is inadequate. A more realistic compromise between the self-enhancement and skill development models would be a reciprocal-effects model, whereby prior self-concept predicts subsequent achievement and prior achievement predicts subsequent self-concept. Marsh and Yeung (1998) reviewed the literature on this reciprocal relation and concluded that, despite some methodological limitations and heterogeneity in terms of design, age, and sample, the research consistently supported a reciprocal relation between these variables (see also Marsh, 2007, for a review). In addition, past research has shown that the reciprocal relation between these constructs is observed with a general measure of academic self-concept (e.g., Guay, Marsh, et al., 2003) as well as with one that is specific to a given school subject (e.g., Marsh et al., 2005). Thus, global or specific academic self-concept would contribute to academic achievement, which would in turn enhance academic self-concept, and so on.

In examining these reciprocal relations, we wondered whether other variables were involved. We propose that motivation is the process that explains how academic self-concept contributes to achievement, which is consistent with expectancy-value theory (Wigfield & Eccles, 2000), self-concept theory (Harter, 1999; Marsh, 2007), and self-determination theory (SDT; Deci & Ryan, 1985). However, few studies have examined the mediating role of academic motivation in the relation between academic self-concept and achievement. The goal of the present study was to test this mediating effect from a self-determination perspective of academic motivation.

1.2. Autonomous academic motivation and achievement

SDT proposes that there are different types of motivation, reflecting different levels of self-determination (i.e., the extent to which behavior originates from the self; Deci & Ryan, 1985). *Intrinsic motivation* is the most self-determined form of motivation and it occurs when a person engages in an activity for its own sake, for the pleasure and satisfaction derived from it. Of course, not all behaviors are intrinsically motivated, some are extrinsically motivated. Extrinsic motivation involves engaging in an activity as a means to an end rather than for its intrinsic qualities. According to SDT, there are several types of extrinsic motivations, differing in their underlying level of self-determination. From the lowest to highest levels of self-determination, the different types of extrinsic motivation are external regulation, introjected regulation, identified regulation, and integrated regulation. *External regulation* refers to behaviors that are not self-determined, being regulated by external means such as rewards and constraints. Regulation is *introjected* when behaviors are partly internalized, but this internalization is not coherent with other aspects of the self. For example, individuals can act in order to rid themselves of guilt, lessen anxiety, or maintain a positive self-image. *Identified regulation* occurs when behaviors are performed by choice, because the individual considers them to be important. For example, a student might not enjoy college, but decides to pursue a college education because it is an important step toward entering the job market in a desired field. According to SDT, an external source of motivation can progressively transform into an identified regulation (personal value) through the process of internalization. When a behavior that was initially externally motivated becomes regulated by identification, it becomes as effective as intrinsically motivated behaviors in producing positive outcomes. Finally, *integrated regulation* occurs when identified regulations are congruent with the individual's values and needs. However, this form of regulation was not addressed in this study. A final type of motivation posited by SDT is *amotivation*, characterized by a lack of intentionality, and therefore a relative absence of motivation (whether intrinsic or extrinsic). Amotivated individuals experience feelings of incompetence and lack of control.

Past research on SDT has distinguished between motivations that are autonomous (intrinsic motivation and identified regulation), controlled (introjected and external regulations) and amotivated. These scores have been used by SDT researchers to calculate a relative autonomy index (RAI), which captures individuals' level of autonomous motivation relative to their level of controlled motivation or amotivation (e.g., Guay, Mageau, & Vallerand, 2003; Hein & Hagger, 2007; Niemiec et al., 2006; Ratelle, Guay, Larose, & Senécal, 2004; Vallerand, Fortier, & Guay, 1997). This measure is typically used in the context of large and complex models because it reduces the number of variables being assessed, thereby increasing the model's parsimony. In the present context, a high positive score on the RAI indicates that the student is motivated to attend school by autonomous reasons (e.g., because it's fun, because it's important) more than by controlled or amotivated ones (e.g., because he feels coerced to go, because his parents reward him for going).

Recently, Guay et al. (2008) reviewed the research on the relation between autonomous academic motivation (i.e., a global measure) and academic achievement and concluded that there is some support for the fact that prior autonomous academic motivation predicts subsequent academic achievement (see also Guay & Vallerand, 1997). However, they underscored the scarcity of longitudinal studies using a repeated measures design to test this relation.

1.3. Relations between academic self-concept, autonomous academic motivation, and achievement

Fig. 1 presents three conceptual models that represent the relations among the variables under study. The first model, which is based on SDT and self-concept theory (Marsh, 2007), proposes that autonomous academic motivation mediates the contribution of academic self-concept to academic achievement (see Fig. 1a). That is, because they feel competent when performing academic tasks, students will experience an increase in autonomous academic motivation, which will make them achieve higher scores on their assignments and exams. Some cross-sectional and longitudinal studies have provided preliminary support for this model (e.g., Fortier, Vallerand, & Guay, 1995; Guay & Vallerand, 1997). For example, Guay and Vallerand (1997) have shown, using a half-longitudinal design and general measures of self-concept, autonomous academic motivation (i.e., not specific to school subjects), and grades, that autonomous academic motivation (as assessed by the RAI) mediates the academic self-concept–academic achievement relation.

Other studies have tested this meditational model for conceptually-related constructs, namely academic interests and academic intrinsic motivation. Indeed, as stated above intrinsic motivation is included in the calculation of the RAI and some studies (see Guay et al., 2008) have shown that intrinsic motivation and autonomous academic motivation might have similar patterns of findings when predicting school outcomes. Marsh et al. (2005) conducted two longitudinal studies to verify whether interest toward math mediates the relation between math self-concept and grades in math. The results of their cross-lagged SEM analyses supported a reciprocal relation between math self-concept and grades. In addition, their results provided some support for a reciprocal relation between math interests and self-concept. However, the cross-lagged relations between math interests and grades were not significant. Using measures that are not specific to a given school subject, Goldberg and Cornell (1998) observed similar relations using intrinsic motivation, autonomous judgment, and perceived competence (a concept akin to self-concept) as predictors of academic achievement. Specifically, cross-lagged longitudinal analyses indicated that prior