Domain-specificity of motivation: A longitudinal study in upper primary school

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ABSTRACT

The purpose of this study was to examine the domain-specificity of motivation in upper primary school. A sample of 722 students reported on their achievement goals, self-efficacy, and effort in language and mathematics twice a year during grade five and six. Results of confirmatory factor analyses and latent growth curve modeling showed that motivational constructs in language and mathematics were domain-specific in nature and developments in domain-specific motivational constructs mostly predicted achievement growth in corresponding subject domains. Yet, compared to previous studies in secondary or higher education, the degree of domain-specificity in upper primary school was found to be limited. High cross-domain correlations indicated a high degree of generality and similar longitudinal developments co-occurred across both domains. Especially achievement goals were highly domain-general. The results suggest that the degree of domain-specificity depends on the nature of motivational constructs and students´ age. Implications of these findings for practice and research are discussed.

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1. Introduction

If a student shows great effort during mathematics, does that imply that this student will also exert great effort during language? Can a teacher conclude that a student who is insecure about her abilities to succeed at her mathematics tasks will also be insecure about her abilities in language tasks? Such questions are reflective of a more general question, i.e., to what extent are motivational constructs domain-specific or general across subject domains? The domain-specificity of motivational constructs has been a topic of interest for many years (e.g., Bong, 2001; Bong & Skaalvik, 2003; Eccles, Wigfield, Harold, & Blumenfeld, 1993; Green, Martin, & Marsh, 2007; Magson, Bodkin-Andrews, Craven, Nelson, & Yeung, 2013; Martin, 2008; Smith & Fouad, 1999) as the issue of domain-specificity is crucial to the question at what level motivational constructs can validly be assessed for research as well as more practical purposes. As such, this study will address the domain-specificity of primary school students' achievement goals, self-efficacy, and effort to increase our understanding of the nature and development of these constructs in young students. From a more practical perspective, a better understanding of the nature of these constructs can help to

determine the level of specificity at which these concepts can best be assessed or targeted for intervention purposes in young children.

Studies on domain-specificity of motivational constructs mainly used factor analyses and estimated cross-domain correlations between the domain-specific motivational factors to establish the extent to which motivational constructs in different domains are associated at a certain point in time. However, this approach of establishing cross-domain correlations reflects only one aspect of domain-specificity. For a deeper understanding of the issue of domain-specificity, two other issues are important to take into consideration. The first one refers to independence of developments over time. That is, if a motivational construct is fully domain-specific, then it not only consists of separate uncorrelated factors, but changes in students' motivation over time in one subject-domain can occur independently of changes in another subject domain. On the other hand, if a motivational construct is not domain-specific but reflects general school-related motivation, than similar changes in students' motivation are expected to occur in multiple subject domains. A second issue refers to unique predictive validity. If a motivational construct is fully domain-specific, then (developments in) this specific motivational construct, will predict students' achievement growth in a corresponding domain better than achievement growth in another subject domain. Hence, motivation for math should for example be more predictive of math achievement than achievement outcomes in other subject domains.

To get a better understanding of the degree to which motivational constructs are domain-specific, studies are needed in which the degree

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of independence of changes over time and the extent to which (developments in) motivational constructs uniquely predict achievement growth are taken into account. Moreover, the degree of domain-specificity of a motivational construct may change depending on the age of respondents. That is, when students become older, their executive functions and cognitive abilities develop (e.g. Blakemore & Choudhury, 2006) and they become more aware of their own interests, strengths, and weaknesses (Harter, 1983; Krapp, 2002; Stipek & McIver, 1989; Wigfield & Wagner, 2005) and motivational constructs may therefore become more differentiated with age. Therefore, longitudinal studies on domain-specificity of motivational constructs will also add to a better understanding of developments in domain-specificity of motivational constructs.

The present study adds to existing research by longitudinally examining domain-specificity of motivation during the last two years of primary school. Like previous research, the present study takes into account the cross-domain relations of a variety of motivational constructs (goal orientations, self-efficacy, and effort) in two subject domains (language and mathematics). Additionally, it is also examined whether the degree of domain-specificity changes as a function of age. Also independence of changes in motivation over time and unique predictive validity of the aforementioned motivational constructs are taken into account to provide a more thorough and more complete understanding of the complex issue of domain-specificity.

1.1. Domain-specificity of motivation

In motivation research, a variety of motivational constructs are distinguished. These include motivational *beliefs* or *appraisals* (i.e. students' personal views of their own motivational tendencies or characteristics in a given situation, such as self-efficacy and achievement goals) and students' motivated *behavior*, which is the behavioral investment or effort of students that results from their motivational beliefs (Boekaerts, 2010; Covington, 2000; Wigfield & Eccles, 2000). Previous research suggested that the degree of domain-specificity varies per motivational construct (Bong, 2001; Green et al., 2007). As such, earlier work on domain-specificity of motivation will be discussed per motivational construct.

1.1.1. Domain-specificity of self-efficacy

Students' self-efficacy is a crucial construct in current motivational theories. It refers to domain-specific or task-specific judgments about one's capabilities to perform the actions that are needed to complete academic tasks successfully (Bandura, 1977). Self-efficacy is rooted in social cognitive theory (Bandura, 1977, 1986, 2001), which assumes that motivated behavior is goal-directed and is initiated and sustained by the extent to which an individual feels efficacious in performing the tasks at hand. Self-efficacy is closely related to competence beliefs, although these concepts are conceptually distinct. Whereas competence beliefs focus on present abilities and measures perceived *competence*, self-efficacy involves predictions for future outcomes and measures perceived *confidence* (Bong & Skaalvik, 2003; Pajares, 1996).

Previous research suggested that competence beliefs are more domain-specific than other motivational constructs, such as achievement goals. Eccles et al. (1993) for example found that competence beliefs in math and reading loaded on two separate factors, while items measuring task value in those two domains loaded on a single factor. According to the internal/external (I/E) frame of reference model by Shavelson, Hubner, and Stanton (1976) and revised by Marsh (1986, 1990); Marsh et al., 2014; Marsh et al., 2015), competence beliefs in a particular domain are formed by comparing oneself to others and by comparing one's own competence in different domains to each other. The comparison with others is referred to as external reference, which will result in positive cross-domain correlations. Comparing one's own competence in a particular domain to competence in another domain is referred to as internal reference and is likely to result in negative

cross-domain correlations. As such, the combination of those two is expected to result in near-zero correlations. These negative internal reference effects are believed to hold only for contrasting subject domains, such as math and language, but not for subject domains that are more alike such as math and science (Marsh et al., 2014; Marsh et al., 2015). A meta-analysis on the I/E model (Möller, Pohlmann, Köller, & Marsh, 2009) indeed reported near-zero correlations between students' competence beliefs in math and verbal domains. These low correlations were found across different instruments and nationalities. Moreover, effects of competence beliefs on achievement-related outcomes were also found to be domain-specific providing further support for the domain-specificity of competence beliefs (see for example, Marsh et al., 2014).

Marsh (1990) suggested that the I/E model also applied to related constructs such as self-efficacy. Yet, outcomes of studies on the domain-specificity of self-efficacy did not support that suggestion and overall found substantial cross-domain correlations for self-efficacy (Marsh, Martin, & Debus, 2001; Möller et al., 2009; Skaalvik & Rankin, 1995). Bong (2001) for example found cross-domain relations of self-efficacy to vary from small to moderate ($r = 0.24$ to $r = 0.63$) with somewhat higher levels of domain-specificity for high school students compared to middle school students. Green et al. (2007) found even stronger cross-domain relations for self-efficacy ($r = 0.71$ to $r = 0.72$) in English, math, and science. Only very few studies have also examined the unique predictive validity of self-efficacy in multiple domains (Bong & Skaalvik, 2003). Two exceptions are Bong (2002) and Green et al. (2007) who found that self-efficacy in a specific domain – although related to effort and achievement outcomes in other domains – most strongly predicted outcomes in the corresponding domain. None of the aforementioned studies examined domain-specificity of self-efficacy longitudinally. Also, none of these studies involved primary school students. By focusing on primary school students and by taking into account longitudinal developments and cross-domain relations with achievement, this study can enhance our understanding of the nature of self-efficacy beliefs in primary school students and how these develop with age.

1.1.2. Domain-specificity of achievement goals

Achievement goal theory (AGT) (Ames & Archer, 1988; Elliott & Dweck, 1988; Hulleman, Schrager, Bodmann, & Harackiewicz, 2010; Nicholls, 1984; Senko, Hulleman, & Harackiewicz, 2011) posits that achievement goals are key aspects of students' motivational beliefs in learning situations. According to AGT, individuals consciously pursue certain goals which guides their behaviors. In the context of schooling, a distinction is made between mastery-oriented and performance-oriented goals (e.g., Ames, 1992; Nicholls, Cobb, Wood, Yackel, & Patashnick, 1990). Mastery-oriented goals – sometimes also referred to as learning goals (e.g., Elliott & Dweck, 1988), task goals, or task-oriented goals (e.g., Nicholls et al., 1990) – reflect an orientation toward developing understanding, increasing skills and competence and mastering tasks at hand (Ames, 1992; e.g., Elliott & Dweck, 1988). Students who adopt mastery goals have been argued to consider ability a malleable characteristic that can be enhanced by effort. As such, these students enjoy challenges and show greater persistence when faced with difficulties (Elliott & Dweck, 1988). Mastery goals have been consistently associated with adaptive learning behaviors and outcomes such as greater engagement in learning and more use of deep learning strategies (for reviews, see Anderman, Austin, & Johnson, 2002; Maehr & Zusho, 2009) as well as higher achievement outcomes (see the meta-analysis by Hulleman et al., 2010).

Performance goals – also referred to as ego goals (Ames, 1992) – reflect an orientation toward demonstrating ability relative to others. As such, individuals with performance goals are concerned with outperforming others or attempting to not perform more poorly (Ames, 1992; Elliott & Dweck, 1988). A further distinction is made between performance-approach and performance-avoidance goals.