

# The formation of academic self-concept in elementary education: A unifying model for external and internal comparisons



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## ABSTRACT

Given its eminent role in student learning and development, it is important to understand how academic self-concept (i.e., how one perceives oneself in an academic context) is formed. Both internal and external comparisons are considered crucial antecedents: Students form their academic self-concept to a considerable extent by (externally) comparing themselves with others and by (internally) comparing their own performance in different academic domains. Building on previous research in secondary education, the main goal of this study is to test a model integrating both comparison processes in elementary education using a large sample of Grade 4 students ( $N = 4,436$ ) nested in 241 classes. Including the proposed internal and external reference effects in one integrated model, the study provided evidence for the presence of both comparison effects on two academic self-concept domains (i.e., math and verbal self-concept). Specifically, students' achievement in one domain was positively related to self-concept in that domain and negatively related to self-concept in the other domain. Additionally, class-average achievement was negatively related to academic self-concept within each domain and positively across domains. In conclusion, this study stresses the need for further integration of the major models on academic self-concept formation in a unifying theoretical framework.

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## 1. Introduction

Academic self-concepts (ASCs) comprise mental representations of one's abilities in academic domains. Current models of ASC (e.g., Marsh/Shavelson Model of Marsh, 1990a; nested Marsh/Shavelson Model of Brunner et al., 2010) differentiate between general ASC and domain-specific ASCs. While general ASC reflects an individual's evaluation of his or her academic abilities across subjects ("I am good at most school subjects"), domain-specific ASCs reflect an individual's impression of his or her ability in a specific academic domain, such as mathematics ("I am good at mathematics") or English ("I am good at English"). In the present study, we will focus on the domain- or course-specific level

of ASC. ASC tends to be highly correlated with academic self-efficacy as one's confidence in successfully carrying out a specific academic task (Bong & Skaalvik, 2003; Ferla, Valcke, & Cai, 2009). However, different from self-efficacy, ASC is more likely to be rooted in social comparisons. In judging one's ASC, individuals use the achievements of relevant others (in school, usually their classmates) as a frame of reference to evaluate their own achievement level (Seaton, Marsh, & Craven, 2010). When evaluating one's efficacy at a particular task, however, individuals assess their chance of succeeding relative to the task at hand which reduces the influence of frame of reference effects (Seaton et al., 2010).

ASC shows beneficial effects on a wide range of educational outcomes. It positively predicts not only student achievement (e.g., Guay, Marsh, & Boivin, 2003; Marsh & O'Mara, 2008; Pinxten, Marsh, De Fraine, Van Den Noortgate, & Van Damme, 2014), but also academic adjustment (e.g., Wouters, Germeijs, Colpin, & Verschueren, 2011), coursework selection (e.g., Dickhäuser, Reuter, & Rilling, 2005), or interest (Marsh, Trautwein, Lüdtke, Köller, & Baumert, 2005). Given its eminent role in student learning and development, it is important to understand how ASC is formed.

Many studies have demonstrated that ASC and academic achievement are positively and reciprocally related to each other (e.g., Huang,

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2011; Marsh & Martin, 2011): ASC and achievement are mutually reinforcing in their development so that for equally achieving students the one with the higher ASC is more likely to develop higher achievement over time. However, not only one's actual performance is considered to be of importance. Research has shown that comparisons are crucial antecedents of ASC (Huguet et al., 2009; Marsh & Martin, 2011; Möller & Marsh, 2013). First, students conduct social comparisons and compare themselves with others (i.e., *external comparisons*). Depending on the achievement level of the respective comparison or reference group, the ASC of equally able students will vary (i.e., ASC decreases with an increasing achievement level of the reference group). Second, students compare their own achievements in different academic domains (i.e., *internal comparisons*). That is, high achievement in one academic domain (e.g., mathematics) can exert a negative influence on the ASC in another academic domain (e.g., English) (for a meta-analysis see Möller, Pohlmann, Köller, & Marsh, 2009).

Although empirical research has unequivocally proven the relevance of both external and internal comparisons for academic self-concept formation, very few studies have empirically considered their combined impact (see Chiu, 2012 and Parker, Marsh, Lüdtke, & Trautwein, 2013 for two recent exceptions). Moreover, none of these studies investigated elementary school students. Yet, it has been suggested that external comparisons may be less important for younger children and that domain-specific self-concepts of younger children may be more strongly interrelated across different academic domains (Dijkstra, Kuyper, van der Werf, Buunk, & van der Zee, 2008; Möller et al., 2009). The present study aims to extend research by studying the complex interplay between internal and external comparisons on students' math and verbal self-concept in a large sample of elementary school students. The impact of internal comparisons on ASC is usually investigated in the internal/external frame of reference model (I/E Model; Marsh, 1986), the impact of external comparisons or reference groups effects on ASC in the big-fish-little-pond model (BFLP Model; Marsh, 1984). We will first describe each of these models in detail.

## 2. The internal/external frame of reference model (I/E Model)

The I/E Model (see Fig. 1a), first proposed by Marsh (1986), primarily describes internal, ipsative-like processes wherein students compare their own achievement in one academic domain with their own achievement in other academic domains (i.e., identifying their strengths and weaknesses across different academic domains). The common depiction of the I/E Model is presented in Fig. 1a. What can be deduced from Fig. 1a is that the I/E model predicts: (a) positive within-domain effects<sup>1</sup> (e.g., a higher math achievement results in a higher math self-concept), and (b) negative cross-domain effects (e.g., a higher math achievement leads to a lower verbal self-concept).

With regard to the correlations between the variables in the model, Marsh (1986) initially hypothesized that the substantial positive correlation between math and verbal abilities would also lead to a positive correlation between math and verbal self-concept. As different academic subjects are often highly interrelated, self-concepts across academic domains should be positively related (Möller et al., 2009). However, because internal comparisons are ipsative, an increase in self-concept in one domain should trigger a decrease in self-concept in another domain, which would entail

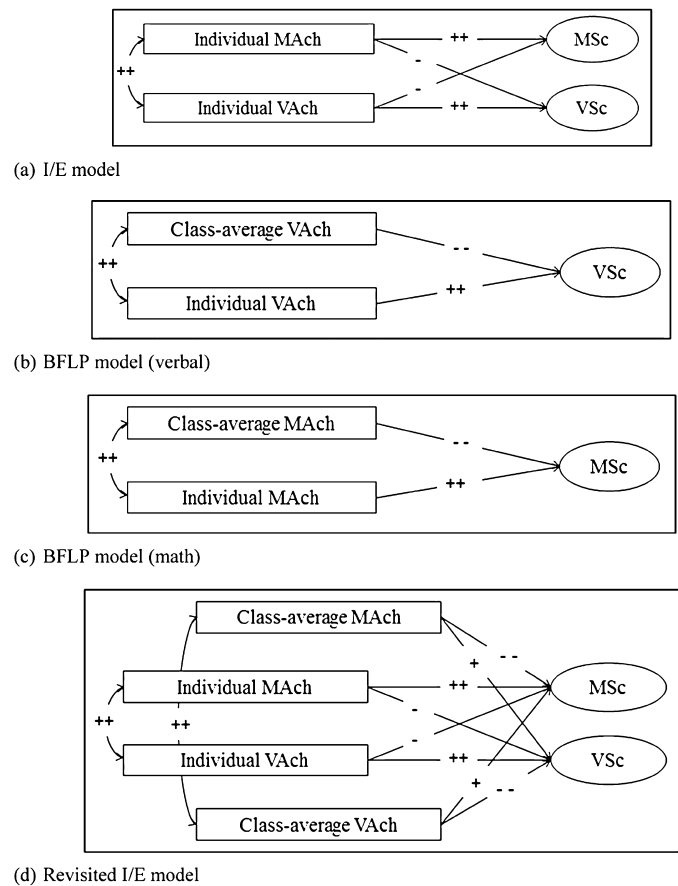


Fig. 1. Predictions for different models under consideration. MAch = math achievement, VAch = verbal achievement, MSc = math self-concept, VSc = verbal self-concept.

a negative correlation between self-concepts across domains (Parker et al., 2013). When combined, both processes then result in the observed close to zero correlations between self-concepts in different domains (Marsh, 1986).

A plethora of studies support the predictions of the I/E Model as depicted in Fig. 1a and the cross-cultural generalizability of the model (Marsh & Hau, 2004). Möller et al. (2009) point at the diverse and sound empirical evidence supporting this model (i.e., experimental studies, longitudinal studies, introspective diary studies, and meta-analyses). Still, we noticed a few important limitations in research on the I/E model. First, as the name of the model suggests, the I/E Model also mentions external comparison processes as influencing students' ASC (Marsh, 1986). However, both in its original depiction (Marsh, 1986, p. 134) and in later elaborations over the years (e.g., Marsh & Hau, 2004; Skaalvik & Rankin, 1995; Skaalvik & Skaalvik, 2002), the social comparison or external component of the model was only implicitly assumed, but not actually modeled: the achievement level of classmates or schoolmates, for instance, was never included as an actual predictor. Second, studies with elementary school children are scarce. In the meta-analysis of Möller et al. (2009), only 10 of the 69 studies under consideration had participants with less than 6 years of schooling. Although the predictions of the I/E Model seemed to generalize over age groups, (positive) correlations between math and verbal self-concept were somewhat larger for younger (before Grade 7) than for older students (Möller et al., 2009). This might indicate weaker effects of internal comparisons (or weaker negative cross-domain effects) for elementary school students than for older students.

<sup>1</sup> Throughout this article we sometimes use the word "effect". In contrast with self-concept theory which discusses the causal relationships between achievement and self-concept, we refer to predictive effects without implying causality in the current article.

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