



The Centrality of Academic Self-Concept to Motivation and Learning

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Academic Self-Concept: A Central Construct in Understanding Motivation and Learning.

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Abstract

At the core of the positive psychology revolution is the construct of self-concept. Historically being one of the cornerstone constructs in the social sciences, the approach to self-concept has been adapted to focus on how healthy individuals can thrive in life. In this chapter we differentiate between the historical unidimensional perspective of self-concept, centred around self-esteem, and the evolving multifaceted models discriminating between different aspects of self, such as specific academic, social, physical, and emotional components.

In this chapter we review:

- historical and evolving perspectives of self-concept
- general and domain specific theoretical models with associated empirical research regarding self-concept, motivation and performance,
- the impact of specific physiological and social traits on self-concept development
- the differentiation between multidimensional perspectives of personality and self-concept.

Keywords

Reciprocal effects model; big-fish-little-pond effect; internal-external frame of reference model; Self-esteem; multidimensional, hierarchical models; construct validity; academic self-concept; cross-cultural generalizability; generalizability over age; self-enhancement model; skill development model; social and dimensional comparison.

Self-concept is one of the oldest constructs in psychology. The idea of the self existed long before the science of psychology was born. Socrates and Plato in the 4th Century BC theorised about the self, as did Descartes in the 17th century, and James, Freud, Bandura, and Rogers in more recent times (see Hattie, 1992). Typing “self-concept” into a search engine produces more than 29,000,000 hits. While it is entirely probable that not all of these will relate to self-concept per se, this staggering amount of hits demonstrates just how important self-concept is, even in today’s technologically advanced world. This chapter begins by discussing the definition, significance, and structure of self-concept focussing on its multidimensionality and continues by reviewing developmental, gender, and educational perspectives, the relation between self-concept and achievement, frame of reference models, and personality perspectives.

What is self-concept and why is it important?

Self-concept and related self-beliefs are key psychological constructs. They represent “a basic psychological need that has a pervasive impact on daily life, cognition and behavior, across age and culture . . . an ideal cornerstone on which to rest the achievement motivation literature but also a foundational building block for any theory of personality, development and well-being” (Elliot & Dweck, 2005, p. 8); a “cornerstone of both social and emotional development” in early childhood (Kagan, Moore, & Bredekamp, 1995, p. 18; Fantuzzo et al., 1996; Marsh, Ellis, & Craven, 2002), “a major (perhaps the major) structure of personality” (Greenwald, 1988, p. 30), and are widely accepted as critical psychological constructs that lead to success in educational settings (Chen, Yeh, Hwang & Lin, 2013; Marsh & Craven, 2006; Marsh & Yeung, 1997), social and emotional situations (Harter, 2012; Marsh, Parada, Craven, & Finger, 2004), and daily life more generally (Eccles, 2009; Elliot & Dweck, 2005). Thus, Guo, Marsh, Parker, and Morin (2015) found that academic self-concept (discussed below) in high school had stronger effects on long-term occupational aspirations and educational attainment five years after high school graduation than did IQ or intrinsic and utility-value motivation. For over a century

theorists have disputed the nature and structure of self-concept. As far back as 1890, James interpreted self-concept from a multidimensional, hierarchical perspective. He distinguished between the material, social, and spiritual self. He proposed that these three components of the self are grouped together in a hierarchical structure, with the material self at the base, the social self in the middle, and the spiritual self the pinnacle of the hierarchy. Subsequent theorists (e.g., Marx & Winne, 1978), however, argued that self-concept was unidimensional in structure, with self-concept being denoted by a single construct such as self-esteem, self-appraisal, or self-worth. Hence, notwithstanding James' insights into the structure of self-concept, by the 1970s the area was lacking in sound methodology, measurement instruments, definition, and theoretical perspectives (e.g., Shavelson, Hubner, & Stanton, 1976; Wells & Marwell, 1976; Wylie, 1979). For these reasons, Hattie (1992) labelled this period as one of 'dustbowl empiricism' as most self-concept researchers tended to "throw it in and see what happens". Thus, in reviewing self-concept research, Byrne (2002) asserted:

Without question, the most profound happening in self-concept research during the past century was the wake-up call sounded regarding the sorry state of its reported findings, which was followed by a conscious effort on the part of methodologically oriented researchers to rectify the situation. (p. 898)

The 'wake-up call' was trumpeted by Shavelson et al. (1976). While criticizing deficiencies in self-concept research, they proposed a "mature construct definition" of self-concept and suggested that self-concept is multidimensional and hierarchical in structure. Integrating key features from 17 different conceptual definitions of self-concept, they defined self-concept as a "person's perception of himself ... formed through his experience with his environment ... and influenced especially by environmental reinforcements and significant others" (p. 411). Thus, not

only does self-concept influence behaviour, but behaviour in turn influences one's self-perceptions and how we view ourselves is influenced by our interactions with others. As such, through others we further develop our understanding of who and what we are (Cooley, 1902). This conceptualisation of self-concept, being influenced by both oneself and others, has led to self-concept being regarded as a critical variable in a variety of research areas. The multidimensional hierarchical model proposed by Shavelson et al. (1976) had self-concept at the pinnacle of the hierarchy, divided into two second-order components: academic self-concept and non-academic self-concept (see Figure 1A). These two factors were further micronized, with academic self-concept being divided into subject-specific self-concepts and non-academic self-concept being comprised of physical, social, and emotional components. At the time, Shavelson et al. (1976) were unable to empirically test their model, as appropriate measurement instruments were unavailable. This was rectified by Marsh and Shavelson (1985) with the Self-Description Questionnaire (SDQ) which was based on the Shavelson et al. (1976) model. Their results produced a revised model (figure 1B) showing that a singular academic self-concept factor was inappropriate; instead two factors, verbal self-concept and math self-concept, were required to ascertain relationships between the lower-order factors (see Figure 1B).

Subsequent SDQ instruments (see Marsh, 2007; also see review by Byrne, 1996) were developed for children (SDQI), adolescents (SDQII), late-adolescents/young adults (SDQIII) as well as specialized instruments for very young children aged 4-7 (SDQ-P), elite athletes (Elite Athlete SDQ), and physical self-concept (PSDQ) more generally.

The multidimensional, hierarchal structure as well as the specific domains in the Shavelson et al., (1976) and Marsh/Shavelson (1985) models (Figure 1) has provided a blueprint for most self-concept instruments developed in the last 40 years. Indeed, widely-used

multidimensional self-concept instruments, stimulated at least in part by Shavelson et al. (1976), differ in the self-concept dimensions included (see review by Byrne, 1996), but typically include at least one or more factors representing the specific academic (e.g., MSC in mathematics, and VSC in verbal domains), social (e.g., relationships with friends and family), physical (e.g., physical competence, attractiveness), and emotional spheres of self-concept, as well as a global self-esteem (general self-concept) scale as posited in the Shavelson et al. (1976) model.

Domain specificity

A critical feature of the Shavelson et al., (1976) and Marsh/Shavelson (1985) models (Figure 1) is the domain specificity of particularly academic self-concept (ASC). The relationship between self-concept and academic achievement was investigated in an early meta-analysis by Hansford and Hattie (1982). The correlation between non-domain specific measures of self-concept and academic achievement was positive but moderately low ($r = .21$). However, when a more specific measure of ASC was used, this correlation increased to $r = .42$, supporting the multidimensional and domain specific nature of self-concept. Shavelson and Bolus (1982) similarly reported that the correlation between subject-specific grades and subject-specific self-concepts was stronger when compared with a singular measure of academic self-concept. Hence, academic self-concept and academic achievement appear to be positively related and this relationship is domain specific. So, for example, math self-concept is more strongly related to math achievement than to verbal achievement and verbal self-concept is more strongly related to verbal achievement than to math achievement.

A study of German high school students emphasises this domain specificity. Marsh, Trautwein, Lüdtke, Köller, and Baumert (2006) demonstrated that math, German, and English self-concepts were substantially positively related to their corresponding outcome measures, whereas a global self-esteem measure was uncorrelated with them. For example, math self-

concept was significantly correlated with achievement in a standardised math test ($r = .59$), with taking advanced math courses ($r = .51$), and with math grades ($r = .71$). Although we touch on this issue only briefly, this issue of domain specificity is central to each of the sections that follow.

Does Self-Concept Vary between Age and Gender?

Reviews (e.g., Wylie, 1979) have historically acknowledged that general self-concept was mostly uninfluenced by gender and/or age, although subsequent meta-analyses (Kling, Hyde, Showers, & Buswell, 1999) found minor differences favoring boys. Wylie (1979), however, proposed that small gender differences in general self-concept may reflect greater gender differences within specific self-concept components. When specific self-concept components were considered, Marsh (1989; also see Crain, 1996; Eccles, 2009; Jacobs, et. al., 2002; Marsh, 2007) reported the following gender differences were consistent with traditional gender stereotypes: (a) boys had higher physical ability, appearance, math, emotional stability, problem solving, and general self-concepts; (b) girls had higher verbal, honesty, and spiritual self-concepts; and (c) gender differences were small for the parents and general school scales. Marsh (1989) also found a reasonably consistent pattern of self-concepts decreasing from a young age, balancing out in middle adolescence, and finally improving during early adulthood. The interactions between age and gender, however, were typically minor, suggesting that the reported gender differences were relatively stable from preadolescence to at least early-adulthood. Such consistent gender differences support a domain-specific approach to self-concept.

Self-concept formation in very young children aged 4-8: Developmental Perspectives.

For many developmental researchers and early childhood programs (e.g., Fantuzzo et al., 1996),

self-concept and competence perceptions more generally have been a “cornerstone of both social and emotional development” (Kagen, Moore, & Bredekamp, 1995, p. 18; also see Davis-Kean & Sandler, 2001; Marsh, Ellis, & Craven, 2002). Eder and Mangelsdorf (1997) argued that self-concepts develop early in childhood and are enduring.

Major advances in theoretical models and the development of self-concept instruments during the 1980s and 1990s described earlier emphasized specific self-concept domains rather than one global component. A lack of measurement research with young children, however, lead Marsh, Debus and Bornholt (2005) to argue that better multidimensional instruments, based on a rigorous approach to the construct validation, would stimulate progress in theory, research, and practice for young children, much as it had already done for older students.

When considering responses from young children, a difficulty to identify the desired factors may result from problems with the specific instrument or the incapacity of the children to reliably express their self-concepts with standardized paper-and-pencil assessments. An adaptive procedure has, however, been developed by Marsh, Craven and Debus (1991, 1998) for measuring multiple facets of self-concept for children aged 5-8 using an individual interview format to overcome these issues. Similar to older children, they found that these pre-school children were in fact able to distinguish between different self-concept components. However, there were differences between the responses of the pre-school children in comparison to those of older children. In their study consisting of even younger children (aged 4 and 5 years old), Marsh, Ellis and Craven (2002) reported good psychometric properties in that the self-concept scales had strong reliability (ranging from .75 to .89; $Md = .83$), first and higher-order confirmatory factor analytic models fitted the data well, and correlations among the scales were moderate (r_s $-.03$ to $.73$; $Md = .29$). Achievement test-scores correlated modestly with academic

self-concept factors (r s .15 to .40), but were either non-significantly or significantly negatively related to non-academic self-concept scales.

Shavelson et al. (1976) hypothesized that self-concept factors would become more distinct and less correlated as an individual grows older. Marsh and Ayotte (2003) reviewed previous tests of this hypothesis, but suggested that the results were more complex than initially posited. In particular, they proposed and found support for a differential distinctiveness hypothesis; with increasing age and cognitive development, there are counterbalancing processes of self-concept integration and differentiation. Integration occurs when closely related areas of self-concept become more strongly related; differentiation refers to the increasing differentiation of disparate areas of self-concept (math and verbal self-concepts).

There are many theoretical perspectives that endeavour to explain how self-concept changes with age. For example, Marsh and Craven (1997) proposed that the high self-concepts children held in childhood get challenged more and more often as children get older, resulting in a decline in their self-concepts with increasing age. Some researchers argue that turbulent changes associated with puberty result in significant declines in self-perceptions (see Harter, 1998), while yet others theorize that when social skills, autonomy, and maturity improve, so too do self-concepts (Hart et al., 1993). Notwithstanding these theoretical contributions, our understanding of the relationship between self-concept and age would benefit from more targeted research examining the issue.

In summary, research with young children supports the feasibility and validity of adapted self-report instruments for young children as a basis for validating claims based on theoretical models of self-concept development. Further, children as young as four and five years should be capable of distinguishing between multiple dimensions of self-concept. The combination of

adapted assessment tools, improved methodology, and sound statistical procedures should facilitate high quality self-concept research when assessing younger children as has been the case for self-concept research with older children, adolescents, and adults.

Are Personality and Self-Concept Related?

Historically, personality has been differentiated from self-concept, which they view as a more malleable personality characteristic, and fundamental personality traits such as the Big Five (neuroticism, extraversion, conscientiousness, agreeableness, and openness). Both self-concept and personality researchers consider their constructs to be multidimensional. However, Marsh Trautwein, et al. (2006; see also Marsh, 2008) noted that in personality research, when self-concept was considered, it was treated as a unidimensional construct, often using global self-esteem measures. Global self-esteem is typically positively correlated with conscientiousness, openness, and agreeableness, and negatively correlated with neuroticism (see Watson et al., 2002).

Integrating multidimensional perspectives to both self-concept and personality, Marsh Trautwein, et al. (2006) examined the relations between 17 self-concept factors (an extended version of the SDQIII) and the Big Five personality factors. Additionally, they included well-being and academic outcomes (i.e., school grades, test scores, and coursework selection). Both self-concept and personality were shown to be multidimensional constructs with limited support for a well-defined hierarchical structure. They also evaluated support for convergent and divergent validity of relations between self-concept and personality factors. Convergent validity was supported as substantial correlations were found between self-concept and personality factors that were logically related to each other (e.g., conscientiousness with honesty and trustworthiness, $r = .40$; neuroticism with emotional stability, $r = -.82$). Divergent validity was

evidenced by little or no relation between self-concept and personality factors that were not logically related to each other (e.g., agreeableness with physical ability self-concept, $r = .04$; openness with physical appearance self-concept, $r = .02$). An exploratory factor analysis of all factors (self-concept, personality, and well-being) resulted in a seven-factor solution. Self-concept and personality factors logically associated with each other loaded on the same higher order factor. In contrast, self-esteem loaded on only one of the seven higher-order factors and was not even the highest loading self-concept component for that higher-order factor. Self-concept factors were highly and systematically related to achievement measures (e.g., math self-concept with math grades, $r = .71$; verbal [German] self-concept with German grades, $r = .51$). Interestingly, the relations between the Big Five personality and wellbeing factors with academic outcomes were mostly low, and did not add to the prediction of academic outcomes beyond the contribution of ASC factors. Their findings also indicated that particular self-concept factors predicted considerable amounts of variance in each of the Big Five personality and well-being factors. For the personality factors, the predicted variance fluctuated between 23% and 60% ($M = 39\%$) and for the well-being factors the variance was between 14% and 19% ($M = 17\%$). Conversely, self-esteem by itself explained almost none of the variance in the personality or well-being factors. Taken together, these results indicate that multidimensional self-concept measures would be better suited for use in personality research rather than the global self-esteem measures in common use.

Theoretical Models of Relations Between Academic Self-concept and Achievement

In this section we make the case for the domain specificity of relations between ASC and achievement consistent the Shavelson et al. (1976) and Marsh and Shavelson (1985) models and then review the following three major theoretical models of relations between ASC and

achievement (see Figure 2):(a) Reciprocal effects model (REM) of relations between academic achievement and ASC over time; (b) Internal/external frame of reference (I/E) model, which relates math and verbal achievement to corresponding measures of ASC; and (c) Big-fish-little-pond effect (BFLPE): the negative effect of school-average achievement on ASC.

Reciprocal Effect Model (REM): The causal relationship between self-concept and academic achievement

Having demonstrated that self-concept and achievement are substantially correlated, the key question became whether a causal link existed between the two: Was one the cause or effect of the other? This is an especially important question as it has wide-reaching implications for self-concept theory and for teaching practices that can successfully improve academic success. Traditional approaches to this issue (Calsyn & Kenny, 1997) took an “either-or” approach—either prior achievement leads to subsequent ASC (a skill development model) or prior ASC leads to subsequent achievement (a self-enhancement model). However, integrating theoretical and statistical perspectives, Marsh (1990) argued for a dynamic reciprocal effects model (REM) that incorporates both the skill development and the self-enhancement models, such that both ASC and achievement are posited to be causes and also effects of each other.

The research evidence supporting the REM has grown steadily, showing that prior self-concept and subsequent achievement are positively related, as are prior achievement and subsequent self-concept (e.g., Chen, Yeh, Hwang, & Lin, 2013; Marsh, Trautwein, Lüdtke, Köller, & Baumert, 2005; Möller, Retelsdorf, Köller, & Marsh, 2011; Muijs, 1997; Pinxten, De Fraine, Van Damme, & D’Haenens, 2010; Trautwein, Lüdtke, Köller, & Baumert, 2006; see also Marsh, 2007). In meta-analyses of these studies, Valentine et al. (2004; also see Huang, 2011)

found consistent support for the REM. Consistent with ASC theory and research, it is not surprising that prior achievement has an effect on ASC. However, the meta-analysis revealed that the effect of prior ASC on successive achievement, after controlling for the effects of prior achievement, was also highly significant overall and positive in 90% of the studies they considered. In these meta-analyses, support for the REM generalized over country, age, gender, and different ASC instrument.

The REM has also been shown to be valid for young children. Using a multicohort-multioccasion design, Guay et al. (2003) surveyed three cohorts of students, ranging in age from 8 to 10 years, at three time points. Academic self-concept was measured using the perceived academic competence subscale of the French version of the Self-Perceptions Profile for Children (Boivin, Vitaro, & Gagnon, 1992). A three-item teacher rating scale was used to assess academic achievement in reading, writing, and math. Results demonstrated strong support for the REM in this sample of young students, leading the authors to conclude that the REM generalizes well across preadolescent students.

REM research has also been extended to elite swimmers (see Marsh and Perry, 2005), the physical domain (Marsh, Chanal, & Sarrazin, 2006; Marsh, Gerlach, Trautwein, Ludtke, & Brettschneider, 2007; Marsh, Papaioannou, & Theodorakis, 2006), and academically gifted students. For example, Seaton, Marsh, Parker, Craven, and Yeung (2015) compared the size of the REM in a sample of gifted students who attended academically selective schools and students who attended mixed-ability comprehensive schools. They found that the REM was similar in size and direction in both samples, suggesting that it would not be a waste of their time for teachers in academically selective and mainstream schools to improve students' academic self-concepts alongside their academic achievement.

REM researchers have also questioned whether or not individual student characteristics can mediate the relationship between academic self-concept and academic achievement. In a longitudinal study based on two large samples of German high school students, Marsh et al. (2005) assessed the relation between academic self-concept, academic achievement (measured by grades and standardized tests), and academic interest. In addition to support for the REM, they found that prior self-concept was significantly associated with subsequent academic interest, when previous grades, test scores, and interest were controlled for. However, prior academic interest was only minimally associated with subsequent academic self-concept and had little or no effect on achievement. In sum, this study showed that the effect of prior academic self-concept on subsequent achievement was not mediated by academic interest. Furthermore, it appears that very little research has been conducted into the mediating role of individual characteristics in the REM and hence this could be a fruitful area for future research.

Baumeister, Campbell, Krueger, and Vohs (2003) challenged the view that high self-esteem leads to better academic achievement. Instead, they ascertained that high self-esteem was partly the outcome of good academic achievement, and that boosting students' self-esteem had "not been shown to improve academic performance and may sometimes be counterproductive" (p. 1). However, as argued by Marsh and Craven (2006), Baumeister et al. (2003) based their review on self-esteem as a unidimensional construct and, although they recognised its existence, ignored the multidimensionality of self-concept. In doing so, they did not consider any of the domain specific studies that would have demonstrated reciprocity between academic self-concept and achievement. Indeed, Marsh and O'Mara (2008) were able to demonstrate that, whereas self-esteem was only weakly associated with GPA or educational attainment, academic self-concept was positively and reciprocally related with both these measures of achievement.

Thus, the REM has played a significant role in the advancement of self-concept theory. Not only has it demonstrated the mutually positive reinforcing relationship between self-concept and achievement, but it has also established self-concept as fundamental to success and achievement.

Are Different Frames of Reference Important for Self-Concept?

To evaluate abilities and opinions, individuals often use others to obtain a sense of one's relative standing. This was recognized even as early as the time of William James (1890/1983) who noted that "we have the paradox of a man shamed to death because he is only the second pugilist or the second oarsman in the world" (p. 310). These comparative processes, or frames of reference, serve an important purpose in forming self-perceptions. Multiple frames of reference can be used to assess one's accomplishments that form the basis of self-concept self-perceptions (Shavelson et al., 1976; Skaalvik & Skaalvik, 2002). Such frames of reference can include, for example, an external criterion (the five-minute mile), a personal goal (running 100 metres in less than 12 seconds); social comparisons (class- or school-average levels of achievement), temporal comparisons (improvement over time), dimensional comparisons (accomplishments in one domain relative to those in others), or a personal, internal standard (a personal best).

In this section we focus on two frame of reference models. The first is the Big-Fish-Little-Pond Effect (BFLPE) in which the frames of reference are comparisons with the achievement of classmates and the negative effect that school or class average achievement has on academic self-concept (see Figure 2B). The second is the Internal/External Model (I/E Model and its extension Dimensional Comparison Theory) in which individuals use dimensional comparisons (comparing achievement in one domain with that in another) and social comparisons with one's classmates.

The Big-Fish-Little-Pond Effect (BFLPE)

Theoretical BFLPE Model. The BFLPE model has its theoretical basis in psychophysical and social judgment (e.g., Helson, 1964; Marsh, 1974; Morse & Gergen, 1970; Parducci, 1995; Upshaw, 1969; Wedell & Parducci, 2000), sociology (Alwin & Otto, 1977; Hyman, 1942), relative deprivation (Davis, 1966; Stouffer, Suchman, DeVinney, Star, & Williams, 1949), and Social Comparison Theory (Festinger, 1954). In essence, the BFLPE proposes that students form their academic self-concepts by comparing their academic achievements with those of their classmates. As such, the model states that, although there is a positive relation between individual ability and academic self-concept, a high class or school average ability is negatively related to academic self-concept (see Figure 2B). Consider this example. Alex and Bill are above-average math students of similar ability, but Alex attends an academically selective school and Bill attends a mixed-ability school. In the academically selective school the school average math ability is higher than that of the surrounding mixed-ability schools. In the mixed-ability school the school average math ability is similar to that of other mixed-ability schools. Bill's math ability is extremely good compared to his classmates, so his math self-concept is high as he is a big fish in a little pond. However, in Alex's school there are many highly capable math students and compared to them his math ability is average. As a result, Alex's math self-concept is low as he is a little fish in a big pond. Here we see the frame of reference of the BFLPE at work: by attending the academically selective school Alex feels less competent in math than Bill, even although they are both of similar math ability. Hence, ASC is influenced not only by a student's own academic achievement, but also by the accomplishments of his classmates.

Early BFLPE Research. In what became one of the first BFLPE studies undertaken, Marsh and Parker (1984) examined the effect of SES on ASC. They found that, controlling for

family SES and individual student achievement, the effect of school average SES on ASC was substantially negative. Additionally, although there was a positive relation between individual academic ability and ASC, when individual academic ability was controlled for, school average ability and ASC were negatively related. This pattern of results is now known as the BFLPE: equally able students had lower ASCs in high-ability/high SES schools than those in low-ability/low SES schools. Although the emphasis in this study was on SES and not school average ability, the correlation between these two variables was so high that they could not be distinguished from each other. This was rectified when Marsh (1987) used the Youth in Transition Study to show that the negative effects of school-average SES on ASC were substantially smaller than those based on school-average ability.

Since the Marsh and Parker (1984) study results from BFLPE research have provided support for the multidimensionality of self-concept (Marsh & Craven, 2006). When examined in academic settings, results indicate that the BFLPE is specific to ASC, as school and class average achievement has little effect, either positively or negatively, on global self-esteem or on non-academic self-concept (e.g., Marsh, 1987; Marsh, Chessor, Craven, & Roche, 1995; Marsh & Parker, 1984; for a review, see Marsh, Seaton, et al., 2008).

The BFLPE has been shown to exist at different levels of education, both in primary schools (e.g., Marsh, Chessor, Craven, & Roche, 1995) and in high schools (e.g., Marsh, Köller, & Baumert, 2001). For example, Craven, Marsh, and Print (2000) used a sample of students in special Gifted and Talented primary classes and compared their ASCs with those of gifted students who attended streamed or mixed ability classes. Over time, the ASCs of the students in the special Gifted and Talented primary classes declined more than those of the gifted students in the streamed or mixed ability groups, although there was no difference between the groups on

achievement.

Over the ensuing years there has also been widespread support for the predictions of the BFLPE, spanning such areas as: its effect on educational outcomes (Marsh, 1987, 1991); its durability (Marsh, Trautwein, Lüdtke, Baumert & Köller, 2007); and its generalisability across educational levels, countries, and cultures (e.g., Marsh & Hau, 2003; Marsh et al., 2001; Mulkey et al., 2005; Seaton, Marsh, & Craven, 2009, 2010; Zeidner & Schleyer, 1998). For example, it has been shown that, apart from ASC, school average achievement can have a negative effect on many other desirable educational outcomes including: educational aspirations, general self-concept, school grades, standardized test scores, advanced coursework selection, subsequent college attendance, and occupational aspirations (Marsh, 1991). The BFLPE can also affect psychosocial constructs, such as importance, effort persistence, and rehearsal, elaboration, and control strategies (Xu, 2010). These findings imply that attending a high-ability school has negative effects on more educational outcomes than just ASC alone, meaning that such students may not be reaching their full academic potential.

How Long-lasting Is the BFLPE? Although some researchers (Dai, 2004; Dai & Rinn, 2008) have suggested that the BFLPE is nothing more than a short-term ephemeral effect, research has shown that it is long-lasting. Two large longitudinal studies with German high school students provided evidence of the long-term durability and persistence of the BFLPE. In the first study, Marsh, Trautwein, Lüdtke, Baumert, and Köller (2007) found that, two years after graduation from high school, the effect of school average achievement on math self-concept was still negative. In the second study, these authors demonstrated evidence of the BFLPE four years after students had left high school. Furthermore, Marsh and O'Mara (2010) demonstrated that school-average achievement had a negative effect on school grades and that this effect remained

for up to five years after graduation from high school. Evidence from other longitudinal studies (e.g., Marsh, 1991; Marsh, Köller, & Baumert, 2001; Marsh, Kong, & Hau, 2000) has also shown that the BFLPE is no short-term effect, but is stable and persistent over time.

BFLPEs For Academically Disadvantaged Students. Research has also shown that the BFLPE affects academically disadvantaged students who attend mainstream classes. Labelling theory predicts that placing academically disadvantaged students in special classes, instead of mainstream classes, should result in lower ASCs and stigmatization for these students. However, Marsh, Tracey, et al., (2006; see also Tracey et al., 2003) found the opposite: It was the academically disadvantaged students in mainstream classes who had lower ASCs than their equally able peers who were placed in special classes with similarly academically disadvantaged students. From a BFLPE perspective this finding makes perfect sense. In mainstream classes, the academically disadvantaged students have students of higher ability with whom to compare their achievements, with the resulting drop in ASC.

There is now considerable support for the negative effects of school-average achievement on ASC (see review by Marsh, Seaton, et al., 2008; Marsh & Seaton, 2015). Demonstrating that the BFLPE is one of psychology's most cross-culturally universal phenomena, four successive PISA data collections (Marsh & Hau, 2003: 103,558 students from 26 countries; Seaton, Marsh & Craven, 2010: 265,180 students from 41 countries; Nagengast & Marsh, 2012: 397,500 students from 57 countries); Marsh, Parker & Pekrun, 2017: (485,490 fifteen-year-old students, 18,292 schools, 68 countries) showed that the effect of school average achievement on ASC was negative in all but one of the 191 samples, and significantly so in 182 samples. These multiple country studies have provided very strong support for the BFLPE permitting Seaton et al. (2009) to conclude that the BFLPE is a pan-human theory as it "is not only a symptom of developed

countries and individualist societies, but it is also evident in developing nations and collectivist countries of the world.” (p. 414).

Moderators of the BFLPE. A critically important method for extending knowledge of a theory is to test whether there are any variables that can moderate the effect. If strong BFLPE moderators were found, this information would aid in understanding the underlying processes of the BFLPE and allow the development of interventions that could lessen its negative consequences. However, if the BFLPE were to generalise across diverse student characteristics, then such evidence would strengthen support for its theoretical basis. In one of the most encompassing studies searching for BFLPE moderators, using the PISA (2003) database, Seaton et al. (2010) examined 17 potential moderators of the BFLPE. These included individual student characteristics such as, student background, learning styles, and the perceived learning environment. Statistically significant moderating effects were found for some of these potential BFLPE moderators. However, in relation to the large sample ($N=265,180$), most were considered too small to be practically important. Those, for which effect sizes suggested that the interactions were of substantive value, moderated the BFLPE in a negative direction. The BFLPE was worse for anxious students, and for those who reported having a cooperative social orientation or who employed surface learning. Overall however, they concluded that results supported the generalizability of the BFLPE “as it was reasonably consistent across the specific constructs examined” (p.390).

Personality factors have also been evaluated as moderators of the BFLPE. Using the big-five traits and narcissism, Jonkman et al. (2012) found that if students had high narcissism levels then they had higher ASCs and the BFLPE was smaller. However, if students reported high levels of neuroticism then the BFLPE was stronger. As was the case with the Seaton et al. (2010)

study, the moderating effects were modest as the direction of the BFLPE was not changed, thus providing further support for the generalizability of the BFLPE.

Extensions of BFLPE Theory: Negative Effects of Year in School. The BFLPE effect is based on the assumption that the academic accomplishments of classmates form a frame of reference or standard of comparison that students use to form their own academic self-concepts. However, being in a school environment with more or less able students, as operationalized by school average achievement, is not the only way in which a student's frame of reference can be altered. For a variety of reasons, such as acceleration or starting school at an early age, students can find themselves in classes with older, more academically advanced students who form a potentially more demanding frame of reference than would same-age classmates. Similarly, due to starting school at a later age or being held back to repeat a grade, students may find themselves in classes with younger, less academically advanced students.

Based on the logic of frame-of-reference effects and BFLPE theory, Marsh (2016; also see Marsh, Pekrun, et al., 2016) posited and found that the relative year in school (being one or more years ahead of or behind the year in school of same-age students) had a negative effect on academic self-concept; the effects on academic self-concept were negative for de facto acceleration (e.g., starting early and skipping grades) and positive for de facto retention (e.g., starting late and repeating grades). In apparently the first large-scale study of this effect, Marsh demonstrated for PISA (2003; 276,165 fifteen-year-olds) that the negative effects of year in school were consistent across the 41 countries. Although NYRiSEs were independent of the negative BFLPEs, it is important to emphasize that the negative effects of year in school were consistent with a priori predictions based on the logic of frame-of-reference effects and BFLPE theory. Marsh, Parker and Pekrun (2017) subsequently replicated these negative effects of year

in school with 68 countries in that PISA (2012) database. Extending this research, they showed that there were negative effects on ASC associated with starting school at a younger age and acceleration/skipping grades, and positive effects for starting school at an older age (an increasingly popular strategy used by parents to advantage their children, also referred to as "red shirting" by Gladwell, 2008) and repeating a grade. Each of these effects is controversial (see Hattie, 2012, for reviews in relation to academic achievement) in that evidence in relation to the effects of skipping grades and redshirting is mixed, while the prediction of the positive effects of repeating a grade contradicts the "accepted wisdom" that this practice has negative effects (but see Marsh, Pekrun et al., 2016). The remarkable feature of the negative year in school effect is that it encapsulates all four of these effects based on a single variable. Regardless of how students end up as older than their same-grade classmates, the negative year-in-school effect leads to higher ASCs. Thus, year in school captured all or at least most of the variance explicable by retention, acceleration, and starting age. These results have potentially important implications, providing a link between research on starting age, retention, and acceleration, where there has been surprisingly little cross-fertilization.

The Internal/External Model (I/E Model)

Theoretical Basis for the I/E model. Most people think of themselves either as someone who excels at math or English, but rarely as someone who excels at both. However, it is often the case that students who excel at one tend to excel at the other too (Marsh, 1986). Why does this disparity between academic self-perceptions and corresponding objective measures of academic performance exist? This relative lack of correlation between math and verbal self-concepts also led to the Marsh/Shavelson (1985) revision of the original Shavelson et al. (1976) model (see Figure 1). The I/E Model (Figure 2C) endeavours to explain this contradiction.

Associations between ASC and achievement are at the heart of the I/E Model (see Figure 2C). According to this model, students use external and internal comparisons to form their self-concepts. The external or social comparisons are those with peers in which students use the accomplishments of others to evaluate their ability. Internal comparisons can be temporal or dimensional. Using temporal comparisons, students compare their performance across time; using dimensional comparisons, students compare their performance across different subjects (Möller & Marsh, 2013). So, for example, using a dimensional comparison, students would compare their accomplishments in maths with those in English. Along with social comparisons, dimensional comparisons are the basis of the I/E Model.

Empirical Support for the I/E Model. The I/E model predicts that, although the paths leading from math achievement to math self-concept and verbal achievement to verbal self-concept will be substantial and positive, the paths from math achievement to verbal self-concept and from verbal achievement to math self-concept will be small and negative. For example, Marsh (1986) noted consistently high correlations between math and verbal achievement ($r_s = .42$ to $.94$), but weak or even negative correlations between math and verbal self-concepts ($r_s = -.10$ to $+.19$). He further noted that the paths from the relevant achievement to the corresponding self-concept domain (i.e., math achievement to math self-concept and verbal achievement to verbal self-concept) were substantial and positive. the paths from math achievement to verbal self-concept and from verbal achievement to math self-concept, however, were significant and negative. Hence, according to the I/E model, individuals whose verbal achievement is high tend to have lower mathematics self-concepts due to dimensional comparison processes, and those with high math achievement tend to have lower verbal self-concepts.

There has been wide support for the I/E model in numerous studies differing in nationality, age, and in their use of self-concept instruments, achievement measures, and methodology (see Marsh, 1990b, 1993; Marsh & Craven, 1997). Cross-cultural comparisons have been important in validating the model (Marsh & Hau, 2004; Marsh, Hau, Artelt, Baumert, & Peschar, 2006). For example, Marsh, Abduljabbar, et al. (2015) studied the I/E model using the Trends in International Mathematics and Science Study (TIMSS) data which contained matched samples of fourth- and eighth-grade students ($N=117,321$) from culturally and religiously diverse countries such as the Middle East (e.g., Iran, Kuwait), Western countries (e.g., Italy, United States) and Asian countries (e.g., Japan, Singapore). Results indicated that the I/E model generalised across the domains of maths and science, but also across age and nationality.

The model has also been supported longitudinally (Marsh, Kong, & Hau, 2001; Marsh & Köller, 2004; Möller, Retelsdorf, Köller, & Marsh, 2011), using experimental manipulation (Möller & Köller, 2001; Pohlmann & Möller, 2006, 2009), and in diary studies (Möller & Husemann, 2006). Importantly, the model has been validated by meta-analyses. For example, using 69 datasets ($N = 125,308$) Möller Pohlmann, Köller, and Marsh (2009) confirmed predictions from the I/E model that generalized across age, gender, and nationality. They found that although math and verbal achievements were highly correlated ($r = .67$), MSCs and VSCs were nearly uncorrelated ($r = .10$) across all studies. Moreover, as the I/E model predicts, the paths leading from achievement in one domain to its matching ASC were positive (.61 for math, .49 for verbal) but those to non-matching domains were negative (math achievement to VSC = -.21; verbal achievement to MSC = -.27).

I/E Effects in Perceptions By Significant Others. Although there is strong support for I/E predictions based on self-perceptions, there is little support for predictions based on the inferred self-concept by significant others (e.g., parents, teachers, or peers asked to rate what self-concept of child, student, or classmate; see Marsh, 2007). However, particularly in high school, teachers in one subject area might not know the abilities of their students in other subject areas. Dickhäuser (2005) used an experimental design to address this issue, providing teachers with experimentally manipulated math and verbal achievement scores for hypothetical students. Consistent with I/E predictions, teachers inferred student to have relatively higher verbal self-concepts when their math achievement scores were relatively lower. However, it will be important to replicate these results based on non-hypothetical students in actual classroom settings.

Research is particularly limited based on inferred self-concept responses by parents for their children. Indeed, primarily on the basis of a single study claiming to test the I/E model for parallel responses by students and their parents (Dai, 2002), Marsh and colleagues (e.g., Marsh, 2007; Marsh, Möller, et al., 2015; Marsh et al., 2014; Möller, et al., 2009) concluded that when parents are asked to infer the self-concepts of their children, parent responses do not reflect internal comparison processes. However, a careful reading of the original Dai (2002) study shows that his tests of the I/E model with parent responses were based on parent perceptions of their child's abilities, rather than parent inferences of their child's self-concepts in different domains (i.e., inferred self-concept ratings). In order to address this issue, van Zanden et al. (2016) conducted a study assessing parents' perceptions of their children's abilities (as in the Dai study) but also their perceptions of their children's self-concepts in the verbal and the mathematical areas. Similarly to Dai's findings, no dimensional comparison effects were found

for parent perceptions of their child's abilities. However, consistently with predictions from the I/E model, negative cross-domain (contrast) effects were found for student self-concept ratings inferred by their parents that were similar to those found with students' own self-concept ratings. Thus, for example, math achievement had positive effects on children's math self-concepts and their self-concept ratings as inferred by their parents, but negative effects on verbal self-concept ratings by the children and the verbal self-concept ratings inferred by parents.

Extensions of the I/E model. Based on the original I/E model, two extensions of it have been proposed: Dimensional Comparison Theory (DCT; Möller & Marsh, 2013) based primarily on earlier I/E studies with other than math and verbal subjects, and generalized I/E model (Möller, et al., 2013) based primarily on earlier studies of the generalizability of I/E predictions to constructs other than self-concept. These extensions include showing that dimensional comparisons are important in predicting long-term academic pathways (Parker et al., 2012, 2014) and in its generalizability to other variables (see Möller, et al., 2016). For example, evidence of I/E-like effects has been noted in the relation between students' achievement and students' perceptions of the learning environment (Arens & Möller, 2016) and between teacher support and intrinsic value and effort (Dietrich et al., 2014).

DCT expanded the focus on math and verbal subject to include all academic subjects that vary along the continuum between maths and verbal domains (see Figure 1B); it positioned the I/E model squarely within frame of reference research by acknowledging the importance of dimensional comparisons (see Möller & Marsh, 2013). In essence, DCT predicts that if subjects are "near" to each other (e.g., Dutch and English for Dutch-speaking student who also study English) then the path coefficient relating academic achievement in one subject to the ASC of the other should be positive. If subjects are "far" from each other (e.g., history and chemistry)

then the path coefficient relating academic achievement in one subject to the ASC of the other should be negative (Möller & Marsh, 2013; Marsh, Lüdtke et al., 2015).

Concentrating on the academic domain, research supporting DCT has been growing steadily (Jansen et al., 2015; Marsh et al., 2015; Möller et al., 2006; Parker et al., 2013). For example, Marsh, Kuyper, et al. (2014) showed that the cross paths relating Dutch and English achievement to Dutch and English self-concepts were positive but that the cross paths relating maths achievement to both language self-concepts were negative. Likewise, Guo et al. (2016) found positive associations between achievement and self-concept for physics and chemistry and negative associations for both physics and chemistry with biology. Consistent with the generalized I/E model, a similar pattern was noted for intrinsic value. The generalized I/E model has also been evaluated beyond the realms of achievement and self-concept, although this research is still rare (see Möller & Husemann, 2006; Möller & Savyon, 2003; Möller & Weber, 2001). In summary, these extensions of the original I/E model have been richly heuristic in terms of generating new research. In particular, DCT provided a clearly defined structure in terms of a priori predictions and the distinction between near and far dimensions. Nevertheless, there is further research needed to establish when dimensional comparisons result in assimilation (for near subjects) and contrast (for far subjects). Because a generalized I/E model has only recently been proposed, there is more research needed to evaluate the conditions under which I/E-like effects generalize to other constructs and conditions, as well as the overlap between these extensions and the original I/E model.

An Integrated ASC Model

Marsh, Pekrun, et al. (2017) recently proposed the integration of these three theoretical models (i.e., REM, I/E, and BFLPE) of ASC formation into a single, unified model. The

overarching aim of this unified model was to systematically explain the relations between ASC and academic achievement across domains (dimensional comparisons within the I/E model), time (development within the REM model), and educational institution level (social comparisons within the BFLPE model). This integration thus forms a three-dimensional cube in which each of the theoretical models forms one dimension; ASC is formed in relation to temporal comparisons (my current accomplishments relative to past accomplishments), dimensional comparisons (my accomplishments in one domain relative to accomplishments in other domains), and social comparisons (my accomplishments relative to those of my peer group). Using a large longitudinal database, Marsh, Pekrun, et al. (2017) demonstrated support for predictions from all three ASC theories based on parameter estimates from a single multilevel statistical model. They also added a developmental perspective, demonstrating that support for theoretical predictions was consistent across five years of compulsory secondary education, suggesting that the self-system had achieved developmental equilibrium during this potentially volatile early-to-middle adolescent period.

Self-concept Interventions

When approaching self-concept with a multidimensional perspective, the different ways in which an intervention impacts an individual can be mapped to the specific, relevant dimensions of self-concept. As such, the extent in which intervention studies impact the different self-concept dimensions is a strong test of the construct validity of a multifaceted perspective of self-concept.

According to a multidimensional perspective of self-concept, interventions should impact in ways that map onto specific, relevant dimensions of the self-concept. Hence, intervention studies provide a strong test of the construct validity of a multidimensional perspective on self-concept. To the extent that an intervention has the predicted pattern of effects on multiple

dimensions of self-concept, there is even stronger support for the construct validity of interpretations of the intervention.

This construct validation approach is evident in academic interventions in which successful interventions impact ASCs more than non-academic and global components (e.g., Marsh, Martin & Hau, 2006; Craven, Marsh, et al., 1991) and physical interventions in which the effects are greater for physical components of self-concept (Marsh & Peart, 1988). This construct validity approach was evident in the juxtaposition of two Outward Bound studies based on residential wilderness interventions. The 'standard' Outward Bound course focused largely on non-academic outcomes (Marsh, Richards, et al., 1986a, 1986b); effects were significantly larger for domains posited a priori to be most relevant to the intervention, were consistent across 27 different programs, and were maintained over 18 months. The Outward Bound 'bridging' course (Marsh & Richards, 1988) was designed to produce significant gains in the academic domain for underachieving adolescents; ASC effects were significantly more positive than non-academic effects and there were corresponding effects on math and reading achievement. If these studies had taken a unidimensional perspective and only measured global self-esteem, both interventions would have been judged much weaker, and a rich understanding of the match between specific intended goals and actual outcomes would have been lost.

Haney and Durlak's (1998) meta-analysis of self-concept interventions found significantly positive – effect sizes, leading to the conclusion that:

it is possible to significantly improve children's and adolescents' levels of SE/SC [self-esteem and self-concept] and to obtain concomitant positive changes in other areas of adjustment. There is even the suggestion that SE/SC programs do at least as well as other types of interventions in changing other domains.

Consistent with typical approaches to meta-analysis of the time, Haney and Durlak considered only one effect size per intervention (i.e., the mean effect size averaged across different self-concept dimensions) where more than one had been considered. In contrast to this implicit unidimensional approach, O'Mara et al. (2006) updated and extended this meta-analysis to embrace a multidimensional perspective, coding the relevance of each self-concept domain in relation to the aims of the intervention. Similar to Haney and Durlak, they found interventions were significantly effective ($d = .51$, 460 effect sizes) overall. However, supporting a multidimensional perspective, interventions targeting a specific self-concept domain and subsequently measuring that domain were much more effective ($d = 1.16$). They also found that studies that targeted global self-esteem were much less successful compared to those that targeted specific components of self-concept. These results demonstrate that the Haney and Durlak meta-analysis substantially underestimated the effectiveness of self-concept interventions and provide further support the usefulness of a multidimensional, domain-specific perspective in relation to self-concept interventions.

Summary

In a rapidly changing world, students' positive academic self-beliefs might be more beneficial than developing specific and specialized skills which could be obsolete in the next decade. Thus, for example, Marsh and Yeung (1997a, b) demonstrated that although self-concepts in specific school subjects and matching school grades were both significantly correlated, the specific facets of academic self-concept predicted subsequent coursework selection much better than school grades or more general components of self-concept (e.g., self-concept). Similarly, Marsh and O'Mara (2008) showed that ASC formed in high school contributed to prediction of long-term educational attainment eight years later beyond the effects

of school, standardized achievement tests, IQ, and socioeconomic status. More generally, behavioral implications higher levels of ASC include lower levels of test anxiety (e.g., Zeidner & Schleyer, 1999), taking advanced course work (e.g., Marsh, 1993; Marsh & Yeung, 1997a, b), lower levels of school attrition (e.g., House, 1993), and higher levels of long-term educational attainment (Marsh & O'Mara, 2008). This is because a positive ASC is dynamic in facilitating a range of other psychological attributes that may benefit personal development in various ways (e.g., happiness, academic motivation, career aspiration, resilience when faced with difficulty, etc.) By enhancing one's self-perceptions of how well one can do, one may excel and exceed what seems to be not easily achievable. Hence positive self-beliefs serve as an influential platform for facilitating life potential and getting the most out of life.

Psychology is indeed swiftly evolving (e.g., Seligman & Csikszentmihalyi, 2000), garnering a strong emphasis on how people from all walks of life can thrive. Positive self-beliefs, as emphasized in this chapter, are at the heart of this evolution (Bandura, 2008a, b; Bruner, 1996; Hunter & Csikszentmihalyi, 2003; Marsh & Craven, 2006).

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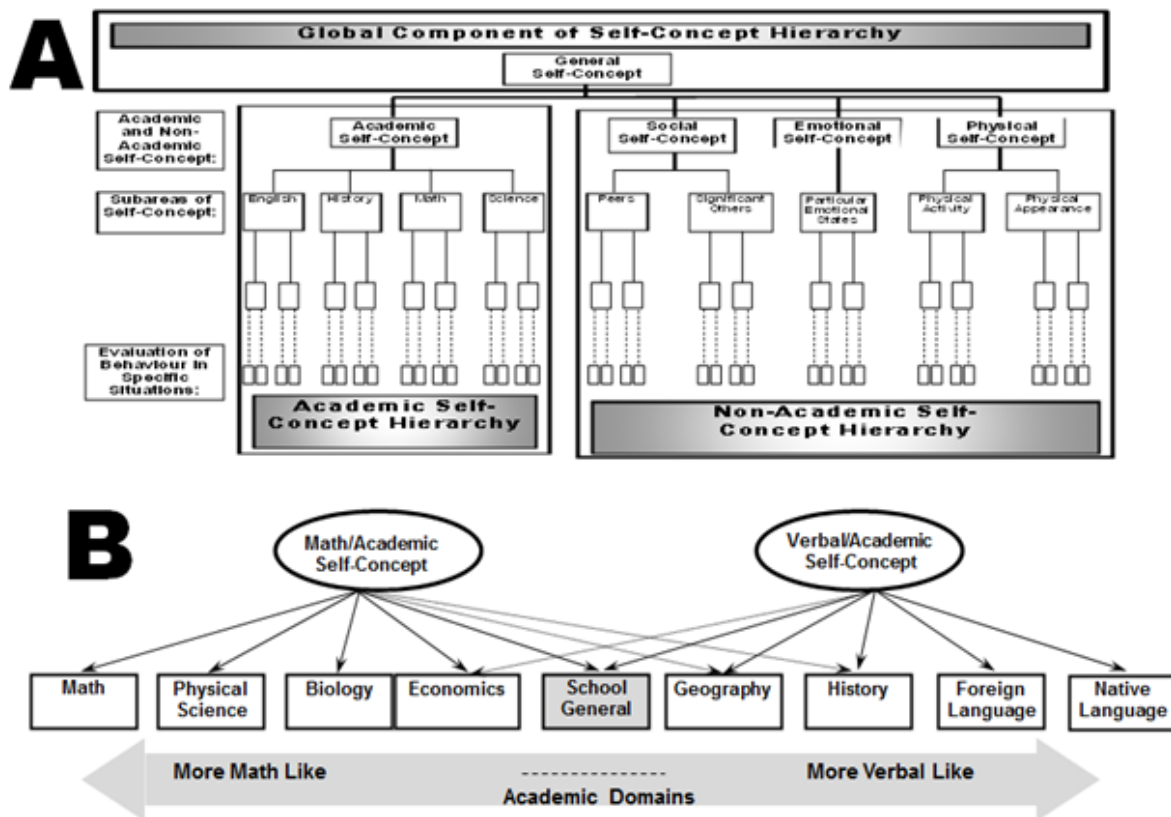


Figure 1. The Structure of Academic Self-concept (Adapted from Marsh, 2007)

A. The Original Shavelson Model.

B. The Marsh/Shavelson Revision of the academic component of the self-concept structure.

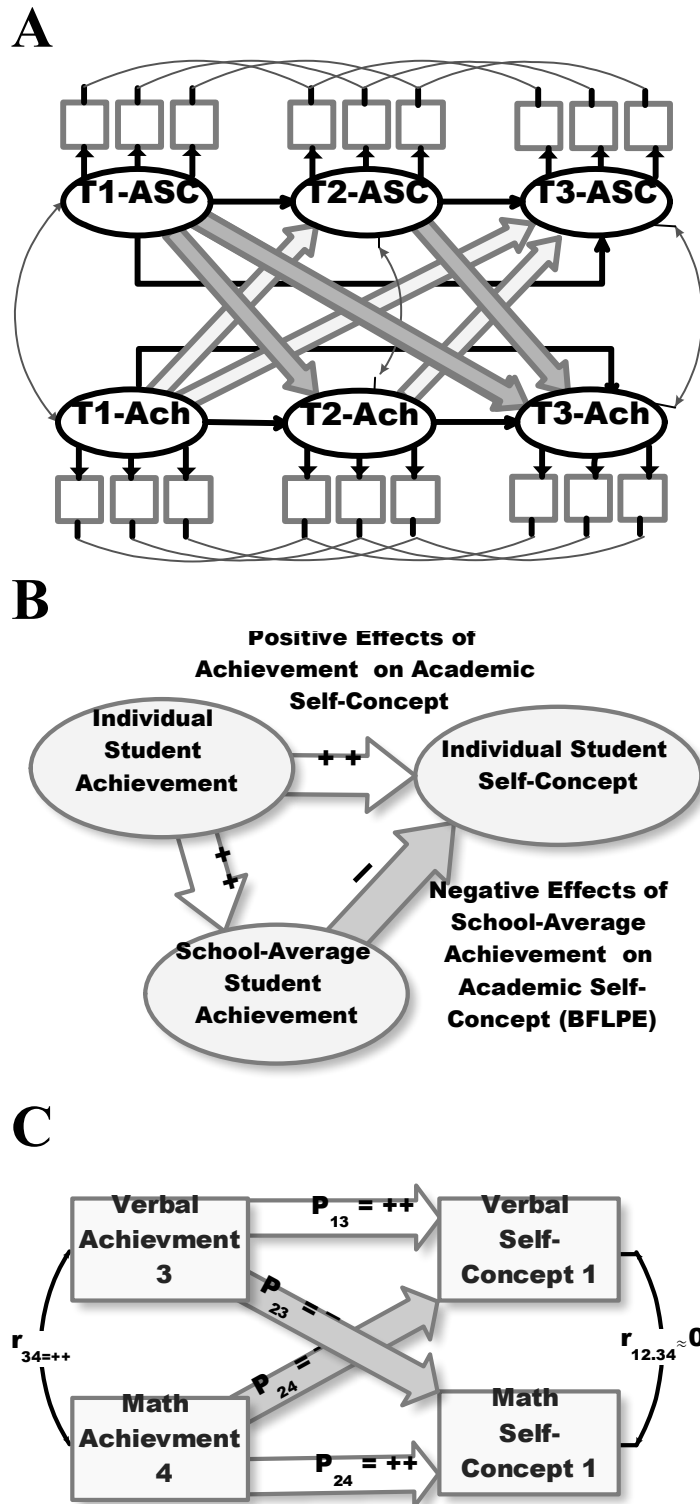


Figure 1. Three theoretical models of relations between academic self-concept (ASC) and academic achievement (Ach; Adapted from Marsh, 2007)

A. Reciprocal Effects Model.

B. Big-Fish-Little-Pond Effect

C. Internal/external Frame of Reference Model