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**Reciprocal Effects of Self-concept and Achievement:  
Competing Multidimensional and Unidimensional Perspectives**

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**ABSTRACT**

The rationale for this presentation is a theoretical model indicating that people who perceive themselves to be more effective, more confident, and more able accomplish more than people with less positive self-perceptions. Support for this prediction is strongest in academic self-concept research where a substantial body of research in support of the reciprocal effects model now exists. On this basis, Marsh and Craven (1997) claim that academic self-concept and achievement are mutually reinforcing constructs, each leading to gains in the other. In contrast, Baumeister, Campbell, Krueger and Vohs (2003) claim that self-esteem has no benefits beyond seductive pleasure and may even be detrimental to subsequent performance in high profile publications that have received extensive international attention. Here we review the theoretical and empirical bases for each set of claims, contrasting the older unidimensional perspectives that focus on global self-esteem and more recent, multidimensional perspectives that focus on specific components of self-concept. Juxtaposing these contrasting sets of results integrating the unidimensional and multidimensional perspectives into a common theoretical framework offers resolution to this apparent conflict, and has important implications for educational research, policy and practice.

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Self-concept is also widely presumed to make a causal difference in addressing some of the key social issues of our time. Attesting to this pervasive significance of the self-construct and the outcomes that are mediated by it, Nathaniel Branden (1994, p. xv) contends:

I cannot think of a single psychological problem—from anxiety to depression, to underachievement at school or at work, to fear of intimacy, happiness or success, to alcohol or drug abuse, to spouse battering or child molestation, to co-dependency and sexual disorders, to passivity and chronic aimlessness, to suicide and crimes of violence—that is not traceable, at least in part, to the problem of deficient self-esteem (Branden, 1994, p. xv).

Hence positive self-belief is valued as a hot variable that makes good things happen, facilitating the realization of full human potential in a range of settings. A theme emphasized here is that the most powerful effects of self-concept are based on specific components of self-concept most logically related to specific outcomes considered in a particular study (a multidimensional perspective) rather than the global component of self-concept represented in global measures of self-esteem (a unidimensional perspective).

This pervasive role of the self-construct has recently been challenged, fuelling debate on its importance. In a highly influential review commissioned for *Psychological Science in the Public Interest* Baumeister, Campbell, Krueger, and Vohs (2003; also see Baumeister, Smart, & Boden, 1996) posed the question: “Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles?” On the basis of their literature review, Baumeister et al. (2003) concluded that enhancing self-esteem only resulted in “seductive pleasure” (p. 39) and as such “self-esteem per se is not the social panacea that many people hoped it was” (p. 38). Although Baumeister et al. considered a variety of outcome measures, they particularly focused on school performance because of its importance in the self-esteem movement, and because of the quality and quantity of research in relation to school performance. More recently, Baumeister, Campbell, Krueger, and Vohs (2005) claimed to have exploded the self-esteem myth that self-esteem has benefits. Although conceding that high self-esteem is clearly associated with higher levels of happiness, the authors again concluded “that efforts to boost people’s self-esteem are of little value in fostering academic achievement or preventing undesirable behaviour” (p. 84).

In dramatic contrast to Baumeister et al. conclusions, we (Marsh & Craven, 1997; in press) claim that enhancing self-concept is a vital goal in and of itself and that self-concept is an important mediating variable that causally impacts on a variety of desirable outcomes including academic achievement. Capitalizing on advances in theory, statistical methodology, and empirical research, we developed a reciprocal effects model (Marsh, 1990b, 1993a; Marsh, Byrne & Yeung, 1999; Marsh & Craven, 1997; in press) whereby the causal relation between academic self-concept and achievement is conceived as dynamic and reciprocal. The reciprocal effects model is underpinned by the notion that people who perceive themselves to be more effective, more confident, and more able, accomplish more than people with less positive self-perceptions (I believe, therefore I am). Support for the reciprocal effects model is particularly strong in relation to academic self-concept and school performance, but is also evident in other domains.

Marsh and Craven (1997) and Baumeister et al. (2003) thus appear to draw contradictory conclusions about the role of self constructs in making good things happen; resolution of this debate has profound policy implications for a wide range of issues in the public interest. Furthermore, both sides of this debate argue that the strongest support for their claims comes from educational research, in which academic achievement is the critical outcome variable. How can such apparently discrepant views exist in an area where so much research has been done? The answer lies in the distinction between a multidimensional perspective of self-concept and the unidimensional perspective that considers only self-esteem—the global component of self-concept.

Baumeister et al.’s review focused almost exclusively on global measures of self-esteem (a unidimensional conceptualization of self-concept) and specifically excluded from consideration, research that focused on domain-specific measures of self-concept (consistent with a multidimensional conceptualization of self-concept) that underpins the conclusions of Marsh and Craven (1997). Indeed, support for the necessity of the multidimensional perspective is particularly strong in educational research that was flagged as a key a focus of the Baumeister review and the major focus of research reviewed by Marsh and Craven. Hence, the key to understanding these apparently contradictory conclusions is to distinguish between the unidimensional perspective that underlies Baumeister et al.’s claim and the multidimensional perspective that is the basis of the Marsh and Craven claim.

The overarching purpose of this paper is to disentangle the research bases upon which these seemingly contradictory conclusions are based. More importantly, we demonstrate that both viewpoints can be integrated into a single theoretical model that explains why both are accurate and consistent with recent

developments in self-concept research. In the following review of relevant research stemming particularly from our self-concept research program, we:

1. Describe a multidimensional, hierarchical model of self-concept and present research support for the salience of this multidimensional perspective which demonstrates that different components of self-concept (e.g., social, physical, emotional, academic, self-esteem) are highly differentiated and cannot be explained in terms of a single global component, as implied in a unidimensional perspective;

2. Develop a construct validity approach to evaluate the external validity of our multidimensional perspective in relation to important criterion variables from a wide variety of psychological disciplines. In support of the convergent validity of interpretations based on a multidimensional perspective, we show that important criterion variables from many areas of psychological research are substantially related to specific components of self-concept to which they are most logically related (e.g., academic achievement and academic self-concept; physical fitness and physical self-concept). In support of the discriminant validity of interpretations based on a multidimensional perspective, we show that the same criterion variables are substantially less correlated with other domains of self-concept to which they are not logically related (e.g., academic achievement and physical self-concept, physical fitness and academic self-concept);

3. Develop a reciprocal effects model to evaluate the causal ordering of self-concept and important criterion variables based on longitudinal data from different psychological disciplines. In developing this model we argue for a multidimensional perspective in which we focus on relations between specific outcomes of importance and components of self-concept most closely related to those outcomes. In our research program we have focused particularly on the reciprocal effects of academic self-concept and academic achievement in longitudinal panel studies. Thus, for example, we demonstrate that there is good support for the reciprocal effects model when the causal relation of academic achievement and academic self-concept is examined, but not for the causal relation of academic achievement and self-esteem. Furthermore, in this section we demonstrate how this distinction allows us to reconcile and more fully explicate, both those results which focus on self-esteem, reviewed by Baumeister et al. (2003) and those of Marsh and Craven (1997), which emphasize academic self-concept;

4. Demonstrate how findings from our reciprocal effects model generalize to different settings. Historically, our work on the reciprocal effects model has been focused on relations between academic achievement and academic self-concept for adolescent students in Western school settings. In this section of our paper, we demonstrate that our more recent research extends the external validity of the reciprocal effects model. We evaluate developmental aspects of this support with young children, demonstrating support for the reciprocal effects model at younger ages than previously thought possible. We demonstrate the cross-cultural generalizability of these results to non-Western school settings. Importantly, we demonstrate the generalizability of the reciprocal effects model to health settings, non-elite sport, and even to winning gold medals at international swimming championships; and

5. Conclude by mapping the important implications of our research for theory, research and public policy.

### *A Multidimensional Perspective Of Self-Concept.*

Historically, self-concept measurement, theory, research, and application has been plagued by the poor quality of both theoretical models and self-concept measurement instruments (e.g., Shavelson, Hubner & Stanton, 1976; Wells & Marwell, 1976; Wylie, 1979). In an attempt to remedy this situation, Shavelson et al. (1976) reviewed existing self-concept research and instruments, proposed a new theoretical model of self-concept, and provided a blueprint for the development of multidimensional self-concept instruments (see review by Marsh & Hattie, 1996). In the multidimensional, hierarchical model proposed by Shavelson et al. general self-concept at the apex of the model is divided into academic and non-academic components of self-concept. The academic component is divided into self-concepts specific to general school subjects, and non-academic self-concept is divided into physical, social, and emotional components, which are further divided into more specific components.

Over the last two decades, instigated in part by the Shavelson model (see review by Marsh & Hattie, 1996), many subdisciplines of psychology have shifted from primary reliance on a global self-esteem measure to including domain-specific assessments of self-concept in addition to or instead of a global self-esteem measure. This research has consistently shown that the proposed hierarchy is weaker than anticipated by Shavelson et al. (1976) and that the specific components of self-concept (e.g., social, academic, physical, emotional) are highly differentiated (Marsh & Craven, 1997; also see Harter, 1998). Marsh (1993a; Marsh & Craven, 1997) argued logically—and demonstrated empirically—that if specific components of self-concept are highly differentiated, then much variation in the specific components cannot be explained in terms of a

single global component such as self-esteem. Following from this result, they proposed a multidimensional perspective to self-concept in which specific components of self-concept most logically related to the aims of the research will typically be more useful—more strongly related to important criteria, more influenced by interventions, and more predictive of future behavior—than a single, global component of self-concept that is intended to provide an overall index of self-concept. Thus, Marsh and Craven (1997) argued that specific domains of self-concept logically related to goals of a particular study are more useful than a global measure of self-esteem. Based on this logic, a new generation of self-concept instruments stimulated by the Shavelson et al. (1976) model has provided overwhelming support for the multidimensionality of self-concept (Byrne, 1996b) that is increasingly being recognized in different psychological disciplines.

### ***Multidisciplinary Support for a Multidimensional Perspective.***

***Educational psychology*** provides particularly compelling support for the multidimensional perspective (Marsh, 1993a, b). Many important academic outcomes are substantially related to academic self-concept but are relatively unrelated to self-esteem and nonacademic components of self-concept (e.g., Byrne, 1996a; Marsh, 1993a, b; Marsh, Trautwein, Ludtke, & Baumert, in press). For example, Marsh, Trautwein, et al. demonstrated a predictable pattern of substantial relations between eight academic criterion variables (grades, test scores, and coursework selection in different school subjects) and corresponding academic self-concepts, whereas self-esteem was nearly uncorrelated with all these criteria ( $r_s = -.03$  to  $.05$ ). Similarly, Marsh (1992) established that relations between academic self-concepts in eight specific school subjects were substantially related to school grades in the matching school subjects ( $r_s = .45$  to  $.70$ ), offering support for the external validity of specific facets of academic self-concept. In contrast, self-esteem was nearly uncorrelated with school grades in all the school subjects, indicating that it had no validity in relation to this criterion. Marsh and Yeung (1997a, b) also demonstrated that whereas self-concepts in school subjects and matching school grades were substantially correlated, the specific components of academic self-concept predicted subsequent coursework selection much better than did school grades or more general components of self-concept. These results provide empirical evidence calling into question the usefulness of a general self-esteem construct in educational psychology research, and offer strong support for the multidimensional perspective.

***Developmental psychology*** research shows that children as young as five can reliably differentiate between multiple dimensions of self-concept with appropriately constructed self-concept instruments (Marsh, Craven & Debus, 1991; Marsh, Ellis & Craven, 2002; Marsh, Debus & Bornholt, 2005) and that the different facets of self-concept become increasingly distinct with age (Marsh & Ayotte, 2003). Thus, for example, factor analysis of adolescent responses to a recent adaptation of the SDQ III clearly supported the 17 self-concept factors that the instrument was designed to measure (Marsh, Trautwein et al., in press). The average correlation among the 17 self-concept factors, even after controlling for unreliability, was only  $.14$ , attesting to the distinctiveness of these factors. In hierarchical factor analyses the correlations between responses to the self-esteem scale and the highest-order self-concept factor are consistently greater than  $.9$ , thus supporting the construct validity of both these conceptualizations of global self-concept (see Marsh & Craven, 1997; Marsh, Parada, Craven & Finger, 2005). Obviously, however, neither the single higher-order factor nor the self-esteem factor is able to provide an adequate summary of such distinct factors so that provide much useful information beyond that provided by self-esteem.

In ***mental health research***, Marsh, Parada and Ayotte (2004; also see Marsh, Parada, Craven & Finger, 2005) demonstrated that relations between 11 self-concept factors and seven mental health problems varied substantially ( $+ .11$  to  $-.83$ ; mean  $r = -.35$ ) and formed an a priori multivariate pattern of relations that supported a multidimensional perspective. Support for the multidimensional perspective was particularly strong for the externalizing (e.g. delinquent and aggressive behaviors) mental health factor. It was modestly negatively correlated with self-esteem ( $r = -.34$ ), substantially negatively correlated with some specific components of self-concept (e.g., parent relations,  $r = -.70$ ), and nearly uncorrelated or even positively correlated with Physical, Appearance, Same-Sex, and Opposite-Sex SDQII self-concept factors. Self-esteem was able to uniquely explain only 3% of the covariation between mental health and self-concept factors, whereas specific components of self-concept explained 97% of this covariation. Based on higher-order factor analyses, Marsh, Parada and Ayotte noted that single higher-order factors could not explain relations among the self-concept factors, among the mental health factors, or between the self-concept and mental health factors; a unidimensional perspective was not viable.

In ***personality research***, Marsh, Trautwein, et al. (in press) demonstrated a well-defined multivariate pattern of relations between multiple dimensions of self-concept and personality (e.g., Big Five personality factors, positive and negative affect, life satisfaction). Seven higher-order factors resulted from the 25 first-

order (17 self-concept, 8 personality) factors. Each Big Five personality factor loaded primarily on one higher-order factor, along with a distinct set of self-concept factors to which it was most logically related. Importantly, self-esteem contributed substantially to only one of the seven higher-order factors, and even for this one higher-order factor, self-esteem was not the highest loading self-concept factor. In this same study, academic outcomes were logically and substantially related to the academic self-concept factors, but nearly unrelated to self-esteem, other non-academic components of self-concept, and the eight personality factors (except, perhaps, Openness). This highly differentiated multivariate pattern of relations argues against the unidimensional perspective of self-concept still prevalent in personality research.

In *sports and exercise psychology*, there is also broad acceptance of the multidimensional perspective of self-concept (Marsh, 1997, 2002). For example, Marsh and Peart (1988) reported that results of a physical fitness intervention, and physical fitness indicators, were substantially related to physical self-concept but nearly uncorrelated with non-physical components of self-concept. Marsh (1997, 2002) demonstrated that objectively measured components of physical fitness are substantially correlated to the specific components of physical self-concept to which they are most logically related, but are substantially less correlated with self-esteem.

*Gender studies* also support the multidimensional perspective. Although gender differences in self-esteem are small (Wylie, 1979), there are modest differences favoring boys that grow larger through high school and then decline in adulthood (Kling, Hyde, Showers, & Buswell, 1999). However, these small gender differences in self-esteem mask larger, counter-balancing gender-stereotypic differences in specific components of self-concept (e.g., boys have high math, physical, and emotional self-concepts; girls have higher verbal, honesty/trustworthiness, and social self-concepts) and this pattern of gender differences is reasonably consistent from early childhood to adulthood (e.g., Crain, 1996; Eccles, Wigfield, Harold & Blumenfeld, 1993; Marsh, 1989; 1993a, b). This rich pattern of gender differences in multiple dimensions of self-concept could not be understood from a unidimensional perspective.

### **Intervention Studies: A Multidimensional Perspective To Construct Validation**

Following from a multidimensional perspective, Marsh (1993a, b; Marsh & Craven, 1997) argued for a construct validity approach to self-concept interventions in which the specific dimensions of self-concept most relevant to the intervention should be most affected, whilst less relevant dimensions should be less affected and should serve as a control for response biases. This approach was demonstrated in a series of studies based on the Outward Bound program. The Outward Bound standard course is a 26-day residential program based on physically and mentally demanding outdoor activities (Marsh, Richards & Barnes, 1986a, b; also see Hattie, Marsh, Neill & Richards, 1997). Consistent with the primarily nonacademic goals: (a) gains were significantly larger for the SDQIII scales predicted a priori to be most relevant to the goals of the program, compared to less relevant SDQIII scales; (b) the effect sizes were consistent across 27 different Outward Bound groups run by different instructors at different times and in different locations, and (c) the size and pattern of the gains were maintained over an 18-month follow-up period. In contrast, the Outward Bound bridging course is a 6-week residential program designed to produce significant gains in the academic domain for underachieving adolescent males through an integrated program of remedial teaching, normal schoolwork and experiences likely to influence particularly academic self-concept (Marsh & Richards, 1988). Consistent with the primarily academic goals: (a) academic self-concept effects were substantial and significantly larger than nonacademic self-concept effects; and (b) there were also corresponding effects on reading and math achievement. If only self-esteem had been measured in these studies, the interventions would have been concluded to be much weaker and the richness of understanding the match between specific intended goals and actual outcomes would have been lost. The juxtaposition of these two interventions and their contrasting predictions provides a powerful demonstration of the importance of a multidimensional perspective of self-concept.

In a meta-analysis of self-concept intervention studies, Haney and Durlak (1998) found modest—but significantly positive—effect sizes. However, reflecting the prevailing unidimensional perspective in many studies included in their meta-analysis, they considered only one effect size per intervention—the mean effect size averaged across different self-concept dimensions if more than one was considered. In contrast, O'Mara, Craven and Marsh (2003) updated and extended this meta-analysis to embrace a multidimensional perspective, coding the nature of the self-concept outcomes in relation to the intervention. Consistent with our multidimensional perspective, effect sizes were substantially larger for specific components of self-concept logically related to the intended outcomes of the intervention than for self-esteem and other less relevant components of self-concept. Studies designed to enhance global self-esteem were not very successful compared to studies that focused on more specific components of self-concept that were most

relevant to goals of the intervention. In summary, intervention research supports the usefulness of a multidimensional perspective of self-concept.

### ***Summary and Implications: Multidimensional vs. Unidimensional Perspectives***

In research reviewed here, specific components of self-concept and global self-esteem have been integrated into a multidimensional, hierarchical model of self-concept. However, based on research comparing the multidimensional and unidimensional perspectives of self-concept, appropriately selected specific domains of self-concept are more useful than self-esteem in many research settings. Clearly it follows that a multidimensional perspective, which incorporates specific components of self-concept and self-esteem, is more useful than a unidimensional perspective that relies solely on self-esteem. Self-esteem can be ephemeral in that it is more affected by short-term response biases, situation-specific context effects, short-term mood fluctuations, and other short-term, time-specific influences. Self-esteem apparently cannot adequately reflect the diversity of specific self domains. Indeed, as emphasized by Marsh and Yeung (1999), it is worrisome that a construct so central to the self seems to be so easily influenced by apparently trivial laboratory manipulations, bogus feedback, and short-term mood fluctuations. In fact, according to modern ethical requirements, such manipulations would probably be unethical if they did have lasting effects on self-esteem. Despite the overwhelming empirical support for a multidimensional perspective on self-concept, we do not argue that researchers should abandon the self-esteem measures that have been used so widely. In fact, consistent with a multidimensional perspective, self-esteem is one of the scales in each of the SDQI, SDQII, and SDQIII instruments that are the basis of much of the research considered here. Rather, researchers should be encouraged to consider multiple dimensions of self-concept particularly relevant to the concerns of their research, supplemented, perhaps, by self-esteem responses.

Here we have critiqued research relevant to the ongoing debate about the relative usefulness of a *unidimensional perspective* that emphasizes a single, global domain of self-concept, typically referred to as self-esteem, compared to a *multidimensional perspective* based on multiple, relatively distinct components of self-concept with a weak hierarchical ordering. Analogous debates reverberate across different psychological disciplines, where researchers are increasingly recognizing the value of multidimensional perspectives (e.g., multiple intelligences vs. a global measure of IQ to characterize a profile of intellectual abilities). The case for a multidimensional self-concept perspective is particularly strong because the multiple dimensions of self-concept are so distinct that they cannot be explained in terms of a single global component and because they display dramatically different patterns of relations with different background variables, outcomes, and experimental manipulations. These results attest to the powerful explanatory power of specific facets of self-concept to influence and explain relations among a wide range of constructs of practical significance that serve to inform theory and practice.

Although support for this multidimensional perspective is evident in many areas of psychological research, it is particularly strong in educational research where academic outcomes are substantially related to academic self-concept but nearly unrelated to global measures of self-esteem. This emphasis on a multidimensional perspective on relations between self-concept and academic achievement is critical to studies attempting to establish the causal ordering of self-concept and achievement in longitudinal panel studies. Following from the logic of a multidimensional perspective, longitudinal paths models of relations between self-concept and subsequent performance should focus on specific components of self-concept most logically related to the criterion performance rather than, or in addition to, other components of self-concept or self-esteem. Having established the importance of a multidimensional perspective to self-concept, we now demonstrate how a multidimensional perspective is the key to understanding the apparent conflict between Baumeister et al. (2003, 2005) and Marsh and Craven (1997) on the causal ordering of self-concept and subsequent performance.

### **Reciprocal Effects of Academic Self-concept and Performance**

#### **Theoretical Models of the Reciprocal Effects of Self-concept and Performance**

Do changes in academic self-concept lead to changes in subsequent academic achievement? The causal ordering of academic self-concept and academic achievement is, perhaps, the most vexing question in academic self-concept research. This critical question has important theoretical and practical implications, and has been the focus of considerable research. Byrne (1984) emphasized that much of the interest in the self-concept/achievement relation stems from the belief that academic self-concept has motivational properties such that changes in academic self-concept will lead to changes in subsequent academic achievement. Calsyn and Kenny (1977) contrasted self-enhancement and skill development models of the self-concept/achievement relation. According to the self-enhancement model, self-concept is a primary determinant of academic achievement. Support for this model would provide a strong

justification for self-concept enhancement interventions explicit or implicit in many educational programs. In contrast, the skill development model implies that academic self-concept emerges principally as a consequence of academic achievement. According to this model, the best way to enhance academic self-concept is to develop stronger academic skills.

Due largely to limitations in statistical techniques to test these models in the 1980s, researchers argued for “either-or” conclusions. In a review and critique of this research, Marsh (1990a, b, 1993a, b; also see Marsh, Byrne & Yeung, 1999) argued that much of this research was methodologically unsound and inconsistent with the academic self-concept theory. He emphasised that it was widely accepted that prior academic achievement was one determinant of academic self-concept. Hence, the critical question is whether there also exists a causal link from prior academic self-concept to subsequent achievement. The statistical significance and size of this path is of critical importance, whether or not it was larger than the path from prior academic achievement to subsequent academic self-concept. Marsh (1990a; Marsh, Byrne & Yeung, 1999) further argued that a more realistic compromise between the self-enhancement and skill-development models was a “reciprocal effects model” in which, prior self-concept affects subsequent achievement and prior achievement affects subsequent self-concept. Marsh’s reciprocal effects model has major implications for the importance placed on academic self-concept as a means of facilitating other desirable outcomes, as well as being an important outcome variable.

Because self-concept and academic achievement are not readily amenable to experimental manipulations, most research relies on longitudinal panel data in which both self-concept and achievement are measured on at least two occasions (i.e., a 2-wave, 2-variable design). With hindsight and 15 years’ experience, Marsh, et al (1999) offered commentary on potential problems and how they can be avoided in future research; demonstrated new, more defensible models of these data; emphasised more generally the role of researcher as substantive data detective; and updated Byrne’s (1984) standards of an “ideal” study and directions for future research. Ideally, studies will: (a) measure academic self-concept and academic achievement (school performance, standardized test scores, or preferably both) at least twice (i.e., a 2-wave study) and preferably more frequently; (b) infer all latent constructs on the basis of multiple indicators; (c) consider a sufficiently large and diverse sample to justify the use of CFA and the generality of the findings, and; (d) fit the data to a variety of CFA models that incorporate measurement error and test for likely residual covariation among measured variables. In Figure 1 we offer a prototype for a causal ordering study.

Despite Byrne’s guidelines and the growing popularity of the SEM techniques, Marsh (1990a) was able to find only three studies meeting Byrne’s criteria (Byrne, 1986; Newman, 1984; Shavelson & Bolus, 1982). Despite some methodological inconsistency in the results of these studies, Marsh suggested that they seemed to be consistent with his earlier suggestion that the effect of prior academic self-concept on subsequent achievement is likely to be greater when achievement is based on school grades. Marsh (1990a) tested the causal ordering of academic self-concept and academic achievement with four waves of data (last 3 years of high school and 1 year after graduation) based on standardized test scores, school grades, and academic self-concept. He found support for reciprocal effects in which the largest paths were from prior academic self-concept to subsequent school grades. Marsh and Yeung (1997a; also Byrne, 1996a updated previous reviews to include new research, but found only nine relevant longitudinal causal modeling studies and again judged none to be fully adequate. They concluded, however, that this research provided reasonably consistent support for a reciprocal effects model.

### ***Classic Causal Ordering Study***

Marsh (1990a) tested the causal ordering of academic self-concept and academic achievement with data from the large, nationally representative (of the US) Youth in Transition study (see Figure 2). He considered data from Times 1 (early 10th grade), 2 (late 11th grade), 3 (late 12th grade), and 4 (one year after normal high school graduation). Three latent constructs were considered: academic ability (T1 only) inferred on the basis of four standardized test scores, academic self-concept (T1, T2, and T4) inferred from responses to 2 (T4) or 3 (T1 and T2) self-rating items, and school grades (T1, T2, T3). Analyses were conducted on responses from the 1,456 students who had complete data at T1, T2, and T3. The initial a priori model (Figure 2) was based primarily on the temporal ordering of the data collection (i.e., T1 variables precede T2 variables). At T1, there were three constructs: academic ability, school grades, and academic self-concept. Academic ability was posited to precede school grades because students were asked to report their grades from the previous year. Similarly, at T2, school grades preceded academic self-concept. At T3 and at T4, only one construct was considered and no casual ordering was necessary.

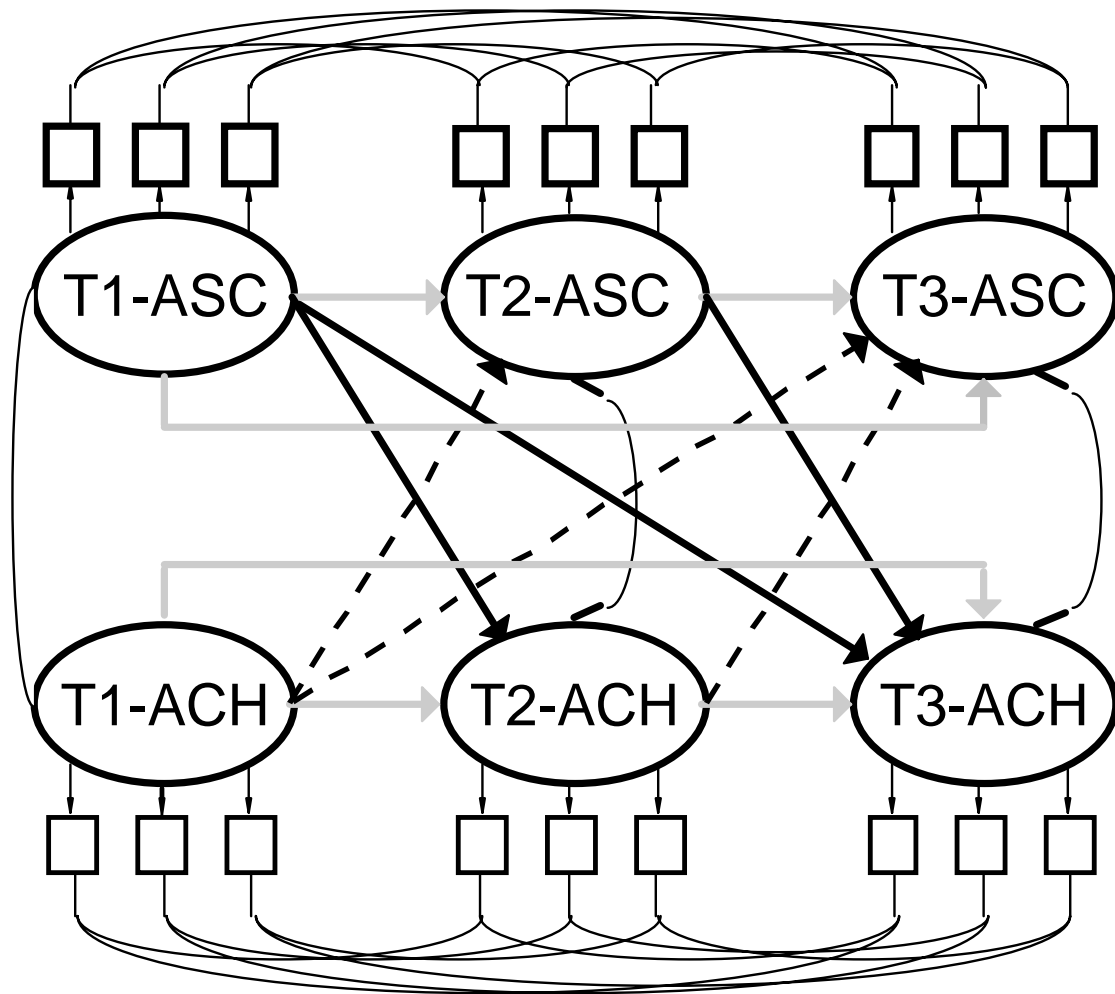
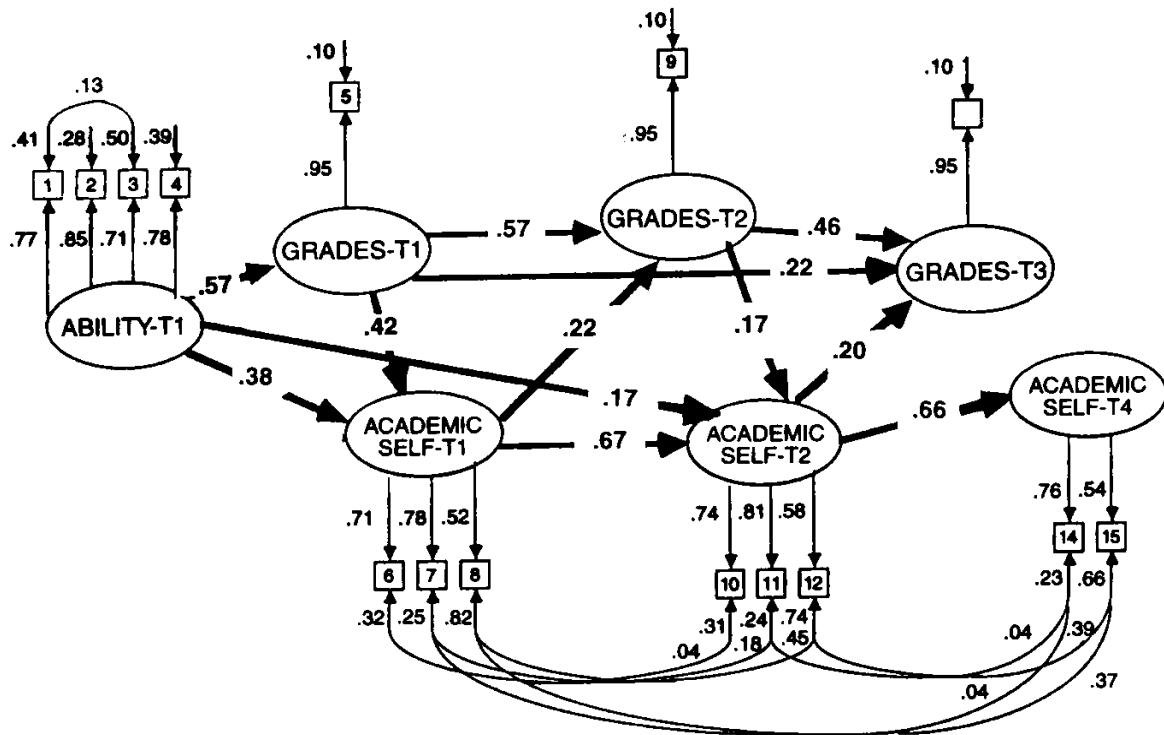


Figure 1. Prototype causal ordering model to test self-enhancement, skill development, and reciprocal effects Models.

[Note: In Figure 1 we present a full-forward multiwave-multivariable model in which multiple indicators of academic self-concept and achievement are collected in three successive waves (T1, T2, and T3). Boxes represent multiple indicators (of self-concept or achievement at each wave), ovals represent latent constructs (self-concept or achievement factors), straight, single-headed arrows represent “causal” paths, and curved lines represent covariances. In the full-forward model, each latent construct has paths leading to all latent constructs in subsequent waves. Within each wave, academic self-concept and achievement are assumed to be correlated; in the first wave this is a covariance between two latent constructs; in subsequent waves this is a covariance between residual factors. Correlated uniquenesses (covariances between measured variable residuals) associated with each measured variable are included between occurrences of the same indicator in different waves. Paths connecting the same variable on multiple occasions reflect stability (the solid gray paths in Figure 4), but will typically differ from the corresponding test-retest correlations (which do not include the effects of other variables).]



**Figure 2**

A structural equation model of the longitudinal panel design relating academic achievement and academic self-concept on multiple occasions: the standardized effects of prior ability, school grades, and academic self-concept on subsequent school grades and academic self-concept. The boxes represent measured variables used to infer each latent construct (the ovals). The straight lines (in bold) connecting the different latent constructs represent path coefficients. Nonsignificant path coefficients are excluded for purposes of clarity. The curved lines represent correlated residuals between measured variables. (From Marsh, 1990. Reprinted with permission.)

Of particular importance are the effects of latent constructs in one wave on latent constructs in subsequent waves. Parameter estimates for the final model showed that at T2, academic self-concept is influenced by academic ability and T1 academic self-concept, but not T1 grades. At T2 school grades are influenced both by T1 academic self-concept and by T1 school grades. Similarly, school grades at T3 are influenced significantly both by T2 academic self-concept and by T2 grades. Academic self-concept at T4 was influenced significantly by academic self-concept at T2 (there was no T3 academic self-concept measure) but not by T3 school grades. Particularly since the results were replicated across two different intervals, the findings provide strong support for the effect of prior self-concept on subsequent school grades. The Marsh (1990a) study is important because it was one of the first studies -- along with, perhaps, Shavelson and Bolus (1982) -- to provide defensible evidence for the effect of prior academic self-concept on subsequent academic achievement and because it was apparently methodologically stronger than previous research.

More recent reviews of causal ordering studies (Marsh, Byrne & Yeung, 1999; Marsh & Craven, in press) based on longitudinal structural equation models demonstrate that academic self-concept influences subsequent academic achievement, coursework selection, and accomplishments, beyond what can be explained by prior academic achievement, whereas self-esteem has little or no influence. Thus, for example,

research based on the reciprocal effects model demonstrates that academic self-concept is a cause as well as an effect of academic achievement in that prior academic self-concept influences subsequent academic achievement beyond the effects of prior academic achievement.

### **Developmental Perspectives on the Reciprocal Effects Model**

Young children's understanding of competence changes with age and—compared with older children—their academic self-concepts are more positive and less related to objective outcomes (e.g., Marsh, 1989; Marsh & Craven, 1997; Marsh, Craven & Debus, 1998). Wigfield and Karpathian (1991, p. 255) further argued that: "Once ability perceptions are more firmly established the relation likely becomes reciprocal: Students with high perceptions of ability would approach new tasks with confidence, and success on those tasks is likely to bolster their confidence in their ability." Consistent with these suggestions, Skaalvik and Hagtvet (1990) found support for a reciprocal effects model for older students (sixth and seventh grades) but a skill-development (ACH → ASC) model for younger students. However, although Marsh et al. (1999) also argued that relations between academic self-concept and achievement become stronger with age, they concluded that there was insufficient evidence to determine whether the nature of causal relations between these variables change with age or whether differences reflect underlying processes or researchers' inability to measure these constructs with young children (see Marsh, et al., 2005).

Guay, Marsh and Boivin (2003) took up this challenge, using a multicohort-multioccasion design (i.e., three age cohorts—students in Grades 2, 3, and 4, each with three measurement waves separated by one-year intervals; see Figure 3). They found that, as children grew older, their academic self-concept responses became more reliable, more stable, and more strongly correlated with academic achievement. However, the magnitude of these developmental differences was small. Importantly, there was stronger support for the self-enhancement model (ACH → ASC) than for a skill development model (ACH → ASC) for all three age cohorts, and support for the reciprocal effects model was invariant over age. This study provided good support for the generalizability of reciprocal effects to young children as well as adolescents.

In summary, whereas there is increasing evidence in support of the reciprocal effects model for older students in middle and high schools, there has been a very limited body of strong research and no consistent pattern of results for young students in the early primary school years. This is indeed unfortunate as many researchers and practitioners alike argue that this is a critical time for young children to develop positive self-concepts of themselves as students (e.g., Chapman & Tunmer, 1997; Marsh, Bornholt & Debus, 2005). In contrast to all previous research, Guay et al., (2003) offer a methodologically strong study that provides clear support for this link, is consistent across comparisons based on different age cohorts of young students and different waves within each cohort. Hence, the results of this study provide stronger support for the generality over preadolescent ages of this important link between prior self-concept and subsequent achievement.

### **Valentine, DuBois and Cooper's Meta-analysis of Causal Ordering Studies**

In their recent meta-analysis of relevant research, Valentine, DuBois and Cooper (2004; also see Valentine & Dubois, in press) concluded that there was clear support for the predictions based on a reciprocal effects model over those derived from the self-enhancement and skill development models. An important feature of their study was that they considered a wide variety of self-belief constructs. Whereas the effect of prior self-beliefs on subsequent achievement after controlling for the effects of prior achievement was modest (mean standardized regression coefficient = .1), the effect was significant overall and positive in 90% of the studies in this meta-analysis. These results led Valentine and Dubois to conclude that claims that self-beliefs are unrelated or detrimental to student achievement are inconsistent with the results of their meta-analysis.

In support of the multidimensional perspective, the effects of prior self-beliefs were significantly stronger when the measure of self-belief was based on a domain specific measure of self-concept rather than on global measures such as self-esteem, and when the self-concept and achievement measures were matched in terms of subject area (e.g., mathematics achievement and math self-concept). In particular, Valentine and Dubois (in press) reported little evidence of effects of global or generalized self-beliefs on academic achievement. Speculating on these results, they suggested that: "Constructs such as general self-concept and global self-esteem simply may be too broad and multi-faceted to represent salient influences on outcomes occurring in a relatively specific realm of functioning such as school." Interestingly, however, the meta-analysis found no significant differences associated with academic self-concept and academic self-efficacy measures.

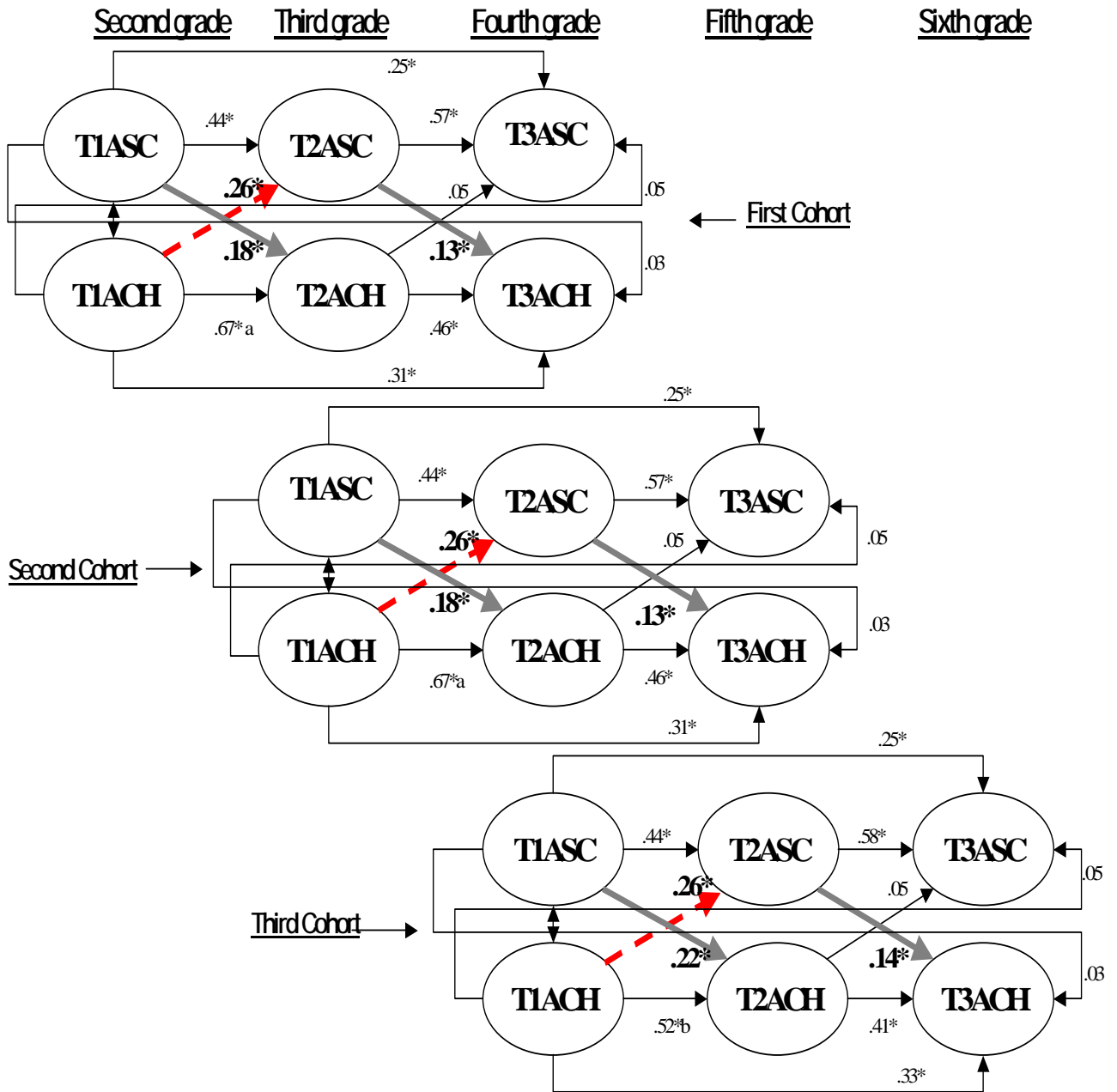


Figure 3. Test of reciprocal effects model across multiple cohorts of young children in Grades 2, 3, and 4, tested in each of three successive years (T1, T2, T3).

ASC = academic self-concept, ACH = academic achievement. (Also see Figure 3A).

In summary, this meta-analysis provides strong support for predictions based on the reciprocal effects model and for the construct validity of the multidimensional perspective of self-concept with its focus on domain specific measures. The results provide strong support for the effect of prior self-concept on subsequent achievement when self-concept is based on a domain specific measure that is logically related to the achievement measure. More generally, the results support a multidimensional perspective in relation to the longitudinal panel studies of the effects of prior self-concept on subsequent achievement, and the reciprocal effects model.

### **Generalizability to Other Domains**

A large body of research in support of the reciprocal effects model of the causal ordering of self-concept and performance is based on academic self-concept and academic achievement in traditional school subjects. However, there apparently are few applications of this model to a physical context with appropriate measures of physical self-concept and physical outcomes. Reflecting historical trends in self-concept research more generally, self-concept instruments used in early physical education and sport/exercise research focused on global self-esteem (Marsh, 1997, 2002). More recently, however, there has been a stronger emphasis on physical self-concept measures designed specifically for physical education, sport and exercise settings (e.g., Fox & Corbin, 1989; Marsh, 1997, 2002), providing clear evidence for their convergent and discriminant validity in relation to other self-concept domains (e.g., academic) and to different physical outcome measures. This follows more general trends in sport/exercise psychology for researchers to develop sport/exercise-specific instruments and to evaluate them within a construct validity framework. This concern has important implications for sport/exercise research, but also has important theoretical implications for the generalizability of the reciprocal effects model and self-concept theory. Following from this emphasis on domain specificity of physical self-concept, we summarize the results from recent studies that apparently represent the first studies to test the generalizability of the reciprocal effects model to the physical domain.

***Gymnastics self-concept and achievement in physical education classes.*** Marsh, Chanal, Sarrazin & Bois (in press) pursued tests of the reciprocal effects, self-enhancement, and skill development models in relation to physical self-concept and performance skills in physical education classes. More specifically, they evaluated predictions about the effects of T1 gymnastics self-concept and T1 gymnastics performance skills collected at the start of a gymnastics training program on T2 gymnastics self-concept and T2 gymnastics performance skills collected at the end of the 10-week program. Achievement was based on videotapes of each student's performance on a standardized gymnastics performance test that was evaluated by three independent expert judges. Inter-judge reliability was extremely good ( $\alpha = .96$  at T1,  $.97$  at T2), and responses to the gymnastics self-concept instrument by students were also very reliable ( $\alpha = .85$  at T1,  $.87$  at T2).

Structural equation models based on responses by 376 adolescents collected at the start (T1) and end (T2) of a gymnastics-training program supported a reciprocal effects model. Even after controlling for the effects of gender and age, the effect of T1 gymnastics self-concept on T2 gymnastics performance (.20) and the effect of T1 gymnastics performance on T2 gymnastics self-concept (.14) were both highly significant. Although there were gender and age effects (girls and older participants had better gymnastics skills, boys had higher self-concepts), multiple group structural equation models indicated that support for the reciprocal effect model generalized over responses by boys and girls and by younger and older students. In summary, consistent with the reciprocal effects models, gymnastics self-concept and gymnastics performance were both determinants and consequences of each other.

***Physical self-concept and physical activity.*** The potential role of physical self-concept in promoting exercise behavior is a critical issue. Physical inactivity and sedentary lifestyles--leading to poor physical fitness, obesity, and a multitude of related health problems--constitute a worldwide health problem for which traditional preventive-medicine interventions have had limited success (Bouchard, Shephard & Stephens, 1994; Pate et al., 1995). The 1996 U.S. Surgeon General's report on physical activity and health singled out the need for research on psychological factors that influence adoption of a more active lifestyle and the maintenance of such behavior. Related concerns are also evident in the shift in emphasis in sport, exercise and physical education research from a narrow focus on sport to a broader focus on health-related outcomes. Despite promotion of the health benefits of physical activity, individuals have difficulty starting, and adhering to, exercise programs. To assist individuals toward regular physical activity, more consideration must be given to constructs such as physical self-concept, motivation, quality of their experience, and how participants feel about themselves in relation to physical activity. Hence, researchers and practitioners have increasingly emphasised psychological constructs such as self-concept, enjoyment, intrinsic motivation, and

quality of life as important means to increasing physical activity. As emphasised by Marsh and Peart (1988), interventions that simultaneously seek to enhance both physical self-concept and physical fitness are likely to be more successful than interventions that focus exclusively on physical activity.

Hagger, Culverhous, Chatzisarantis and Biddle (2003) indicated that one aim of physical education in school settings is to reinforce students' participation in health-related physical activity outside of school and to develop life-long healthy life styles. Although physical education teachers and programs are in a unique position to pursue this aim, there is little research on how effective they are at accomplishing it. In order to address these issues, Marsh, Papaioannou, and Theodorakis (in press) adapted the reciprocal effects model in a study of the causal ordering of physical self-concept and exercise behavior. Based on a large sample of Greek physical education classes (2,786 students, 200 classes, 67 teachers) collected early (T1) and late (T2) in the school year, analyses supported a reciprocal effects model in which prior (T1) physical self-concept and exercise behavior both influence subsequent (T2) physical self-concept and exercise behavior. Consistent with the predictions from the reciprocal effects model, the effect of T1 physical self-concept on T2 exercise behavior (.17) and the effect of T1 exercise behavior on T2 physical self-concept paths (.10) were both highly significant. Extended models that included gender and age showed that for both T2 physical self-concept and exercise behavior, girls had systematically lower scores than boys, and the scores declined with age. There were, however, no significant age x gender interactions.

***Generalisability to Championship Performances in Elite Swimming.*** Support for the benefits of a positive self-concept on subsequent performance and achievement, as reviewed by Marsh et al. (1999) and Valentine et al. (2004), is based substantially on the effects of academic self-concept on school performance and achievement. Recent physical education research (Marsh, Chanal, et al., in press; Marsh, Papaioannou, & Theodorakis, in press) provides an important extension of this research to a physical context in which the focus is on physical components of self-concept and desirable physical outcomes. Nevertheless, this more recent research into physical self-concept-- like most of the research in the Marsh et al. and the Valentine reviews--is based on responses by general populations of students in school settings. Marsh and Perry (2005) extended this research to elite sport, testing the causal ordering of self-concept and performance with a large sample of many of the best swimmers in the world competing at international swimming championships. They measured elite swimming self-concepts of participants in the Pan Pacific Swimming Championships in Australia and the World Short Course Championships in Greece. Top swimmers from 30 countries completed the EASDQ instrument on the first day for each of these championships--prior to actually competing in any events. Also available for all participants were world rankings and previous personal best performances (PPBs) in each of their events. Following from reciprocal effects model, it was predicted a priori that elite swimmer self-concept would affect subsequent championship performance even after controlling for the substantial effects of PPBs (see Figure 4).

Whereas championship performance was highly related to PPB performance ( $r = .90$ ), structural equation models demonstrated that elite athlete self-concept also contributed significantly to the prediction of subsequent championship performance, explaining approximately 10% of the residual variance after controlling for PPB performance. This is an important contribution, particularly in relation to championship performances of elite swimmers at this level where winning margins are so small. Furthermore, for swimmers who competed in two or more events, these results based on the first event were replicated by results in the second event. The results show that elite athlete self-concept has an effect on the subsequent championship performances of elite swimmers beyond that which can be explained in terms of PPBs.

#### **An Alternative Perspective on Causal-Ordering.**

There also exists, however, an alternative perspective suggesting that self-esteem has little or no positive influence on achievement and other performance outcomes, and may even be counter-productive (e.g., Baumeister, Campbell, Krueger, & Vohs, et al. 2003). In a highly influential review, Baumeister et al. addressed the question: "Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles?" Although Baumeister et al. considered a variety of outcome measures, there was a particular focus on school performance, which "has been studied more carefully and thoroughly than other outcomes we discuss in this review" (p. 13). As did Marsh, et al. (1999), Baumeister focused on longitudinal panel designs, emphasizing that this was a potentially conservative approach in that: "Insisting that self-esteem [at Time 1] must predict achievement at Time 2 after controlling for achievement at Time 1 could obscure some actual causal relationships, so it should be regarded as a highly conservative way of testing the hypothesis ... one may be throwing a very large baby out with the statistical bathwater" (p. 9).

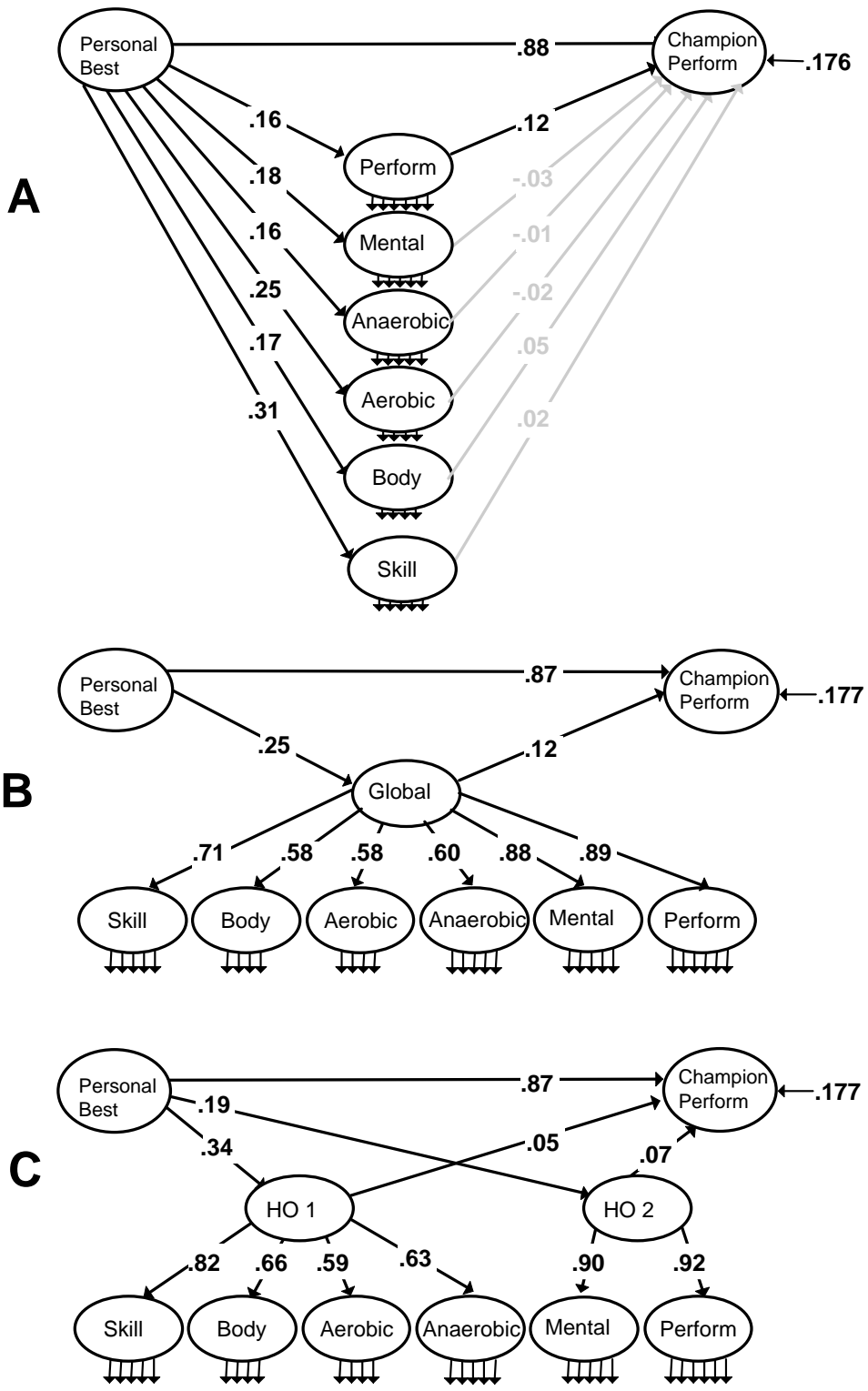


Figure 4. Summary of structural equation models predicting subsequent championship performance on the basis of prior personal best and self-concept responses. Self-concept responses are represented as six first-order factors (A), a single higher-order global factor (B), or as two higher-order factors (HO1, HO2 in 2C). All paths in gray are not statistically significant.

However, in contrast to the Marsh, et al. (1999) and Valentine et al. (2004) reviews, Baumeister et al. concluded that there was little or no evidence to support the causal effects of self-esteem on any school performance measures. The reasons for these discrepant conclusions are that Baumeister et al. focused almost exclusively on global measures of self-esteem and relied mostly on research conducted in the 1970s and 1980s—before current methodological and statistical procedures recommended by Marsh et al. (1999) and others were readily available. In particular, Baumeister et al. specifically excluded research that focused on academic components of self-concept, the basis of nearly all the research considered by Marsh et al. and by the Valentine meta-analysis. Baumeister et al. clearly recognized the need to distinguish between global and domain specific measures of self, noting that: “If relevant domains are hierarchically ordered, then it is important to measure self-esteem at the appropriate level of specificity” (p. 6), but subsequently argued that studies “at the level of domain-specific self-esteem would arguably become more fragmented and less affectively charged. For these reasons, we focus our review on global self-esteem” (p.7). On this basis, Baumeister et al. largely ignored the increasing emphasis on the multidimensional perspective of self-concept and excluded the more recent and highly developed body of academic self-concept research specifically designed to address the question they have sought to answer. A better-balanced approach might have been to recognize that there was a substantial body of research providing results contrary to their conclusions, but then to argue why they felt that it should be ignored.

At the heart of our concern about potential misinterpretations of Baumeister et al.’s (2003) review is the ongoing debate about the relative usefulness of a *unidimensional perspective* that emphasizes a single, global domain of self-concept, typically referred to as self-esteem, and a *multidimensional perspective* based on multiple, relatively distinct components of self-concept with a weak hierarchical ordering. The case for a multidimensional self-concept perspective is very strong because the multiple dimensions of self-concept are so distinct that they cannot be explained in terms of a single global component, and have dramatically distinct patterns of relations with different background variables, outcomes, and experimental manipulations (e.g., see Marsh & Craven, 1997; Marsh, Craven & Martin, in press; Marsh, Parada, & Ayotte, 2004). The juxtaposition between Baumeister et al.’s (2003) conclusions based on self-esteem and our conclusions based on academic self-concept provides clear support for a multidimensional perspective.

### **Integration of Apparently Conflicting Positions**

In this paper, there are dramatically different viewpoints about the potential benefits of a positive self-concept on academic performance. In this section we attempt to explain how such diametrically opposed perspectives can exist in an area that has been so thoroughly researched. As is often the case, apparently conflicting answers stem from differences in the questions that are asked and the evidence that is considered (or not considered). Baumeister et al. (2003) limit consideration to relatively unidimensional measures of self-esteem, adopting an implicit unidimensional perspective to self-concept research. However recent advances in theory and research have demonstrated that self-concept cannot be adequately understood if its multidimensionality is ignored (see Marsh & Craven, 1997). Particularly given that research has clearly shown that global self-esteem is only modestly correlated with school performance (which, in the context of a multidimensional model of self-concept is inherently logical), it does not make a lot of sense to focus on self-esteem instead of academic self-concept. Hence, the chief shortcoming of Baumeister et al.’s review is their failure to consider causal-ordering studies based on academic self-concept that have been the emphasis of most recent educational psychological research into this issue. The appropriateness of basing conclusions on dated research that relied on older unidimensional theories and methodological approaches no longer considered appropriate by current standards, particularly when there is a substantial body of current, methodologically appropriate research available, must also be questioned.

Both the Baumeister et al. (2003) and the Marsh and Craven (1997) claims fail to fully evaluate the alternative perspectives. Whereas Baumeister et al. focused almost exclusively on self-esteem to the exclusion of academic self-concept, reciprocal effects models reviewed by Marsh and Craven (1997) focused primarily on academic self-concept to the virtual exclusion of self-esteem. In fact, the only major point of overlap between the two reviews was the separate analyses of data from the Youth In Transition study, showing (as reported by Baumeister et al.) that self-esteem had little effect on subsequent academic achievement, whereas academic self-concept (see Figure 2) had a systematic substantial affect on subsequent achievement that was replicated across different waves of the study. Whereas the juxtaposition of these two studies is significant, particularly given the importance placed on this study in both sets of claims, there is clearly a need for research that compares the effects of academic self-concept and self-esteem in the same study.

Valentine, DuBois and Cooper (2004; also see Valentine & DuBois, in press), in their meta-analysis of causal ordering studies, have adopted a more inclusive approach than either Marsh and Craven (1997) or

Baumeister et al. (2003). In particular, they included studies based on both global and domain specific self constructs. It is also important to note that meta-analysis is a stronger approach to synthesizing research than traditional literature reviews. Based on their meta-analysis, Valentine and DuBois concluded that there was a preponderance of support for the reciprocal effects model posited by Marsh (1993a; Marsh, Byrne & Yeung, 1999). Whereas the effect sizes averaged across all self-measures were modest, Valentine and DuBois emphasized that the effect on subsequent school performance was stronger for academic self-beliefs such as academic self-concept than for more global self-belief constructs such as global self-esteem, and even stronger when the self-belief term logically matched the achievement construct in terms of domain specificity (i.e., mathematics achievement and math self-concept). Valentine and Dubois (in press) conclude that: "Any claims that self-beliefs are either irrelevant or detrimental to student achievement are not consistent with the cumulative evidence".

Baumeister et al. (2003) implicitly recognize the validity of the multidimensional perspective and a focus on academic self-concept, noting that: "If researchers can effectively identify the adaptive, desirable subcategories of high self-esteem, it may yet be possible to say that certain ways of thinking about oneself can cause good things to happen" (p. 38). The strong support for the reciprocal effects model of academic self-concept and school performance clearly demonstrates this to be the case.

### **Summary: Educational Implications**

The results of causal modeling studies provide a clear affirmative answer to the question "Do changes in academic self-concept lead to changes in subsequent academic achievement?" This research is critically important in that it has established that increases in academic self-concept lead to increases in subsequent academic achievement and other desirable educational outcomes. Hence, not only is self-concept an important outcome variable in itself, it also plays a central role in mediating the effects of other desirable educational outcomes. These findings have significant implications for international educational policy and practice.

It is important to emphasize that the direction of causality between academic self-concept and achievement has very important practical implications for educators. If the direction of causality was from academic self-concept to achievement (the self-enhancement model), then teachers might be justified in placing more effort into enhancing students' self-concepts rather than fostering achievement. On the other hand, if the direction of causality was from achievement to self-concept (the skill development model), then teachers should focus primarily on improving academic skills as the best way to improve self-concept. In contrast to both these apparently overly simplistic (either-or) models, the reciprocal effects model implies that academic self-concept and academic achievement are reciprocally related and mutually reinforcing. Improved academic self-concepts will lead to better achievement AND improved achievement will lead to better academic self-concepts. For example, if teachers enhance students' academic self-concepts without improving achievement, then the gains in self-concept are likely to be short-lived. However, if teachers improve students' academic achievement without also fostering students' self-beliefs in their academic capabilities, then the achievement gains are also unlikely to be long lasting. If teachers focus on either one of these constructs to the exclusion of the other, then both are likely to suffer. Hence, according to the reciprocal effects model, teachers should strive to improve simultaneously both academic self-concept and achievement.

There now exists good support for the reciprocal effects model. However, there is also a need to pursue further research into processes that mediate the positive effects of prior academic self-concept on subsequent academic achievement. Implicit in our discussion is the untested assumption that the effect of prior self-concept on subsequent achievement was mediated by student characteristics such as increased conscientious effort, persistence in the face of difficulties, enhanced intrinsic motivation, academic choice, and coursework selection (see Marsh et al., 1999). Thus, for example, Marsh and Yeung (1997a; 1997b) found that coursework selection partially mediated the effects of prior academic self-concept in a specific school subject on subsequent achievement in the same subject (e.g., high math self-concept led to taking more advanced math courses which led to higher levels of math achievement). Clearly, there is a need for more research exploring the psychological processes that mediate the effects of prior academic self-concept on subsequent achievement.

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