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Specificity of Components of Self-Concept

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Abstract

Researchers have suggested the separation of the competency and affect components of academic self-concept but have not investigated the domain specificity and their differential impacts on the development of self-esteem. A sample of 7th grade students in China ($N = 580$) responded to survey items examining their self-concepts of competency and affect in Chinese, maths and general schoolwork and their self-esteem. Confirmatory factor analysis supported the distinct components in each of the subject domains. Path models supported Marsh's (1986) internal/external frame of reference model such that the paths from Chinese and maths achievement scores to Chinese and maths competency and affect constructs were positive only for corresponding domains. The paths from Chinese and maths components to general school self-concept were component specific such that competency had positive impacts only on the competency component whereas affect had impacts only on the affect component. Finally, the impact of general school competency was more pronounced than that of affect on students' self-esteem. The results provided strong support for the distinctiveness of the competency and affect components of academic self-concept.

Recent research has typically placed a strong emphasis on the domain specificity of academic self-concepts (e.g., Marsh, 1986, 1990; Vispoel, 1995; Yeung & Lee, 1999). To demonstrate the domain specificity of self-concept, Marsh (1986) has proposed an internal-external frame of reference (I/E) model of self-concept development. More recently, researchers have further considered the separation of two major components of self-concept, viz., the competency and affect components, respectively (Marsh, Craven, & Debus, 1999). The separation of the competency and affect components is important because the distinctiveness of the two constructs may imply that students' perceptions of a high level of competency may not guarantee their liking of academic work. Likewise, students who like schoolwork may not feel good about their competency. However, although Marsh et al. (1999) have demonstrated that students' self-concepts of competency and affect are distinguishable, they have not examined their domain specificity and their relations with other constructs. Whereas the distinction between self-concepts in different domains has been found to have important theoretical and practical implications, the distinction between the two components of self-concepts (competency and affect) and the domain specificity of these components may also have important implications (Yeung et al., 2004). The

present study attempts to more vigorously examine the distinctiveness of the two components in specific academic domains and their relations with school self-concept and self-esteem.

Domain Specificity Of Self-Concept

In the school context, the understanding of self-concept is essential because it is an important educational outcome and also an important factor that contributes to other valued educational outcomes (Craven, Marsh, & Burnett, 2003; Marsh, 1990). Numerous studies have shown good relations of academic self-concept to academic achievement and academic behaviour (e.g., Chapman & Tunmer, 1995, 1997; Eccles & Wigfield, 1995; Hay, 1997; Helmke & Aken, 1995; Marsh & Yeung, 1997a, 1997b; Muijs, 1997; Wigfield & Eccles, 1992; Yeung & Lee, 1999), and Marsh, Byrne, and Yeung (1999) have proposed a reciprocal model showing the mutual enhancing effects of achievement and self-concept. For example, Marsh and Yeung (1997a) have demonstrated that self-concept has significant positive effects on subsequent academic achievement whereas prior academic achievement also has significant positive effects on academic self-concept. Marsh and Yeung (1997b) have also shown that self-concept has positive effects on coursework selection. These studies have also shown that academic self-concepts and their relations to other constructs are very domain specific. Thus recent research on academic self-concept has emphasized its domain specificity and multidimensional nature (e.g., Byrne, 1996a; Byrne & Gavin, 1996; Cross & Markus, 1994; Harter, 1996; Hattie, 1992; Lau, Yeung, & Jin, 1998; Marsh, 1993; Marsh, Byrne, & Shavelson, 1988; Marsh, Craven, & Debus, 1998; Marsh, Kong, & Hau, 2001; Marsh & Yeung, 1996, 1998; Yeung, Chui, Lau, McInerney, Suliman, & Russell-Bowie, 2000; Yeung & Lee, 1999), although the hierarchical nature of self-concept cannot be neglected (Marsh, 1987; Marsh, Byrne, & Shavelson, 1988; Yeung et al., 2000). The emphasis on domain specificity has also led to the development of instruments that measure self-concepts in distinctively different areas. The Marsh (1987, 1992, 1993) series of Self-Description Questionnaires (SDQ) for a wide age range, The Vispoel (1995) Artistic Self-Perception Inventory, and the Marsh (1990) Academic SDQ are some examples of some promising multidimensional self-concept instruments that have been used worldwide (see review by Byrne, 1996b).

The Internal-External Frame of Reference Model

The emphasis on domain specificity is primarily due to the consistent finding of distinct self-concept constructs and their domain-specific relations to other constructs. Despite an apparently reasonable assumption that self-concepts in various curriculum domains should be positively correlated, studies have often found a nonpositive (often near-zero) correlation between high school students' verbal and maths self-concepts (e.g., Marsh, 1987; Marsh, Byrne, & Shavelson, 1988; Yeung & Lee, 1999). Findings of a high correlation between verbal and maths achievements but a relatively low correlation between verbal and maths self-concepts have led to a revision of the original self-concept model proposed by Shavelson, Hubner, and Stanton (1976) to a modified model that separately considers the maths and verbal domains (Marsh & Shavelson, 1985).

Marsh (1986) also proposed an internal-external frame of reference (I/E) model to

provide a plausible account for the near-zero correlation between the domain-specific self-concepts (also see Bong, 1998; Skaalvik & Rankin, 1995; Tay, Licht, & Tate, 1995). Marsh (1986) argued that the development of students' academic self-concepts is primarily based on their achievement compared to their peers. By comparing externally with other students in class, those students who are strong in their verbal scores tend to have a high verbal self-concept. However, for those students whose verbal ability is not as good as their ability in math, an internal comparison across subject domains tends to give them a lower verbal self-concept. Marsh suggested that the combined operation of both the internal and external comparisons leads to their responses to the self-concept measures. Since Marsh's (1986) introduction of the I/E model, researchers have replicated the patterns of the I/E model in various cultural and language backgrounds (e.g., Lee, Yeung, Low, & Jin, 2000; Marsh, Kong, & Hau, 2001; Skaalvik & Rankin, 1995; Tay, Licht, & Tate, 1995; Yeung, Chow, Chow, Luk, & Wong, 2004; Yeung & Lee, 1999). Whereas the I/E model has provided an explanation of the development of self-concepts, it has also provided a strong approach to examining the domain specificity of academic self-concepts.

Components Of Academic Self-Concept

Whereas there is ample evidence for the domain specificity and distinctiveness of academic self-concepts across a range of curriculum domains, more recently research has also suggested the distinctiveness of two components of self-concept. Marsh, Craven, and Debus (1999) tested the hypothesis of a separation of two components of academic self-concept, viz., the competency and affect components, respectively. They provided evidence for the separation of the two components, which tends to be more pronounced in more matured students. Thus for high school students, although their personal perceptions of competency in maths, for example, tends to be reasonably associated with their affect in maths, perceptions of a high level of competency may not guarantee their liking of maths. Likewise, those students who like maths may not find themselves competent in maths.

However, although Marsh et al. have demonstrated that students' self-concepts of competency and affect are distinguishable, they have not seriously examined their domain specificity and their relations with other constructs. Neither have they tested whether each component in a curriculum domain is associated with the same component in another domain, which would provide a much stronger scrutiny of the distinctiveness of these constructs. Yeung et al. (2004) tested the competency and affect components of gifted students' self-concepts. They demonstrated a social comparison process between gifted and non-gifted students with the competency measure, but not the affect measure. They argued that the separation of the two components was important for examining the effects of intervention programs on students' competency and on how much they like the learning process. They suggested that social comparison effects may be found only in the competency component, and not necessarily in the affect component. However, they did not test whether the two components were domain specific and whether the I/E patterns found in previous studies (e.g., Lee, Yeung, Low, & Jin, 2000; Marsh, Kong, & Hau, 2001; Skaalvik & Rankin, 1995; Tay, Licht, & Tate, 1995) would apply for both components. Hence, a

strong validation of the components in terms of domain specificity will have significant contributions to the theory of self-concept.

For a strong validation of the competency and affect components of self-concept, and for the separation of the two components to be practically useful, the matching components across various domains should be more highly correlated than would the nonmatching components across domains. An even stronger test of this hypothesis would involve also parallel components (competency and affect respectively) of a general school self-concept used as external criteria in the validation process. Thus, path analysis using a confirmatory factor analysis approach should demonstrate that the competency component of a domain-specific self-concept would be positively related to the competency component, but not to the affect component, of school self-concept whereas the affect component of the domain-specific self-concept should be positively related to the affect component, but not to the competency component, of school self-concept. Furthermore, the Marsh (1986) I/E model should be applicable for at least the competency component such that perceived competency in one curriculum area would lead to lowered perceived competency in another curriculum area. The present study attempts to provide such a rigorous scrutiny of the distinctiveness of the two components of self-concepts in the verbal and maths domains respectively, and of their domain-specific relations with other constructs including self-esteem.

Development of Self-esteem

Self-esteem is believed to be associated with important outcomes and other psychological constructs. It has therefore become a hot topic considered by educators, politicians, business managers, religious leaders, and many other disciplines (Brown, 1993). In the broad definition of self-concept offered by Shavelson, Hubner, and Stanton (1976), self-esteem is equivalent to a general, global self-concept under which multiple dimensions of self-concepts are subsumed (e.g., social, physical, academic self-concepts). Self-esteem is typically assumed to be a content-free representation of self-worth in personality and social psychology. Hence, one's self-esteem is often believed to be an aggregate representation of one's self-concepts in social, physical, academic and other aspects of the self and that it is developed through a combination of impacts from self-concepts in these various aspects. However, it is unclear how significant each of these multiple dimensions of self-concept may contribute, relative to other aspects, to the development of self-esteem. In considering the two components of students' school self-concept (competency and affect), for example, it is unclear whether the component of competency or the component of affect would have a relatively stronger contribution to the development of their self-esteem. The present study thus attempts to examine the relations of the two components of school self-concept with self-esteem.

The Present Study

By examining the relations of students' achievement scores in the verbal and maths domains with their self-concepts in the respective curriculum domains, the present study attempts to (a) test the applicability of the I/E theory to the two components of self-concept (i.e., competency and affect) in the specific verbal and maths domains. By

examining the relations of their component-specific self-concepts in the verbal and maths domains with the two components of school self-concept, the present study attempts also to (b) test whether students' academic self-concepts are not only domain specific but also component specific. Finally, an examination of the relations of the two components of school self-concept with the students' self-esteem, we can also examine (c) which of the two components (i.e., competency or affect) may have a relatively stronger contribution to the development of students' self-esteem. The investigation on the distinctiveness and domain-specificity of the two components is significant for both theoretical and practical reasons. From a practical viewpoint, the separate measurement of the components may provide a more comprehensive evaluation of educational programs (Yeung et al., 2004), but in programs where various curriculum areas may undergo change, it is necessary for a strong validation of the components from a domain-specific perspective. It is also important to understand whether these components would have differential associations with other educational outcomes. Hence, the findings would have significant theoretical and practical implications to educators and educational researchers.

Method

Participants

The participants were 627 7th graders in a high school in the southern part of China (age ranging from 11 to 13; 48% girls), who were involved in a study on self-concept enhancement. Survey data were obtained from the students and achievement data were obtained from the school. The school was the largest in the district, with a total enrolment of 3,000 students. There were a total of 12 classes in 7th grade. The students were of a wide range of abilities and they came from families of a wide range of socio-economic backgrounds, from the wealthiest to the poorest in the district. All the students spoke Mandarin Chinese (also known as Putonghua) and at least one Chinese dialect, and they also learnt English as a foreign language. Consent to participate in the study was obtained from the students before they completed the survey. After listwise deletion of missing data, the analysis used a sample size of 580.

Material and Procedure

All students completed a survey on the constructs of competency and affect when the school year began in 7th grade (see Appendix). A total of 33 items were used. Responses to the items ranged from 1 (strongly disagree) to 5 (strongly agree) and were coded such that higher scores reflected more favourable responses. The items were:

1. Five items each for Chinese, Maths, and School self-concepts of Competency,
2. Four items each for Chinese, Maths, and School self-concepts of Affect, and
3. Six items for the Self-esteem construct.

Components of self-concept. The self-concepts of competency and affect were adapted from the Marsh, Craven, and Debus (1999) and Yeung et al. (2004) studies. All the items for self-concepts of competency and affect were parallel across the Chinese and maths domains and the general school self-concept construct respectively (see Appendix).

Self-esteem. The self-esteem items were adapted from the Marsh (1992) SDQ

instrument (see Appendix). These self-esteem items were designed by Marsh on the basis of Rosenberg's (1979) self-perception measures. The self-esteem scale measures individuals' perceptions of the self in general terms and has demonstrated reliability in numerous previous studies.

School self-concept. The school self-concept items were also adapted from Marsh's SDQII (see Appendix). The school self-concept scale measures students' perceptions of themselves in academic work, but in the present study, the items were divided into the competency and affect components like the domain-specific self-concept constructs.

Statistical Analyses

Preliminary analysis included alpha estimates of internal consistency of each of the a priori measures and principal component analysis with the self-concept items for each domain to test their ability to form the two expected factors (i.e., Competency and Affect). Confirmatory factor analysis (CFA) models were then tested. The conduct of CFA has been described elsewhere (e.g., Bollen, 1989; Byrne, 1998; Joreskog & Sorborm, 1993; Marsh & Hocevar, 1985; Pedhazur & Schmelkin, 1991) and is not further detailed here. All analyses throughout this paper were conducted with the SPSS version of PRELIS and LISREL (Joreskog & Sorbom, 1988). The goodness of fit of models is evaluated based on suggestions of Marsh, Balla, and McDonald (1988) and Marsh, Balla, and Hau (1996) with an emphasis on the Tucker-Lewis index (TLI), but we present also the chi-square test statistic, the relative noncentrality index (RNI), and the root mean square error of approximation. For an acceptable model fit, the values of TLI and RNI should be greater than .9.

A series of CFA models were tested based on a 33 x 33 (15 Competency + 12 Affect + 6 Self-esteem items) covariance matrix. Table 1 shows the models tested in the present study. Models 1 to 8 were measurement models testing the construct validity of the a priori factors (Table 1). Model 1 tested whether the components of Chinese self-concept (competency and affect) were distinguishable from each other whereas Model 2 examined whether the nine items of Chinese self-concept was a single factor. Similarly, Model 3 tested whether the maths self-concepts of competency and affect were distinguishable from each other whereas Model 4 examined whether the nine items of maths self-concept was a single factor. In the same way, Model 5 tested whether the global school self-concepts of competency and affect were distinguishable from each other whereas Model 6 examined whether the nine items of school self-concept would form a single factor. Support for Models 1, 3, and 5 would provide evidence for the distinctiveness of the competency and affect constructs of academic self-concept.

Table 1. *Goodness-of-fit Summary for Models*

Models	$\chi 2$	(*df*)	TLI	RNI	RMSEA	Null χ^2	(*df*)
Measurement Models							
1. 2 Chinese self-concept factors	89.73	(26)	.963	.974	.065	2442.72	(36)
2. 1 Chinese self-concept factor	380.11	(27)	.804	.853	.150	2442.72	(36)
3. 2 Math self-concept factors	50.59	(26)	.986	.989	.040	2388.82	(36)

4. 1 Math self-concept factor	341.37	(27)	.822	.866	.142	2388.82	(36)
5. 2 School self-concept factors	99.16	(26)	.939	.956	.070	1683.48	(36)
6. 1 School self-concept factor	543.88	(27)	.582	.686	.182	1683.48	(36)
7. 9 factors	1766.42	(526)	.858	.875	.064	10509.08	(595)
8. 9 factors, 27 CUs	912.47	(499)	.950	.958	.038	10509.08	(595)
Path Models							
9. Achievement to 4 self-concepts	266.72	(148)	.973	.979	.038	5764.74	(190)
10. 9 factors path model (27 CUs)	912.47	(499)	.950	.958	.038	10509.08	(595)
11. 9 factors no remote paths (27 CUs)	934.53	(509)	.950	.957	.038	10509.08	(595)

Note: N = 580. RNI= Relative noncentrality index. TLI= Tucker-Lewis index. RMSEA=Root mean square error of approximation. FacCoeff=Factor Coefficient.

Model 7 was a model incorporating nine factors, viz., Chinese achievement, maths achievement, Chinese self-concept of competency, Chinese self-concept of affect, maths self-concept of competency, maths self-concept of affect, school self-concept of competency, school self-concept of affect, and self-esteem (i.e., general self-concept). Whereas the Chinese and maths achievements were single items, the other constructs were derived from multiple items. Because the items for Chinese, maths, and school self-concepts were parallel across domains, we expected that for the model to fit the data, the residual variances for the parallel items should be correlated. Thus Model 8 differed from Model 7 in that Model 8 included 27 correlated uniquenesses. Support for Model 8 would provide evidence for the construct validity of the nine a priori factors.

Upon validation of the constructs, we would examine the paths from the achievement scores to the Chinese and maths self-concepts of competency and affect (Model 9). We hypothesized that the paths from each of the subject domains to the self-concepts of competency and affect of its matching domain would be significant whereas the paths for nonmatching domains would be nonsignificant. Support for this hypothesis would provide evidence for the domain specificity of the impact of achievement on both components of academic self-concept.

Model 10 is a model equivalent to Model 8 but examines paths from the achievement scores to the Chinese and maths self-concepts, which lead to the school self-concepts that subsequently lead to self-esteem (Figure 2). To test the hypothesis that the self-concepts of competency and affect are component specific, the critical paths to examine are the paths from Chinese and maths self-concepts of competency to school self-concept of competency and also from Chinese and maths self-concepts of affect to school self-concept of affect. Statistical significance of these matching paths together with nonsignificance of the paths for nonmatching components would provide evidence for the component specificity. Finally, we would examine the paths from school self-concepts of competency and affect to self-esteem. We hypothesized that self-concept of school competency would have a relatively stronger impact on self-esteem. Thus a significant path from school self-concept of competency to self-esteem and a nonsignificant path from school self-concept of affect to self-esteem would provide support for this hypothesis (Figure 2).

Results

Preliminary Analysis

The alpha reliability estimate for each of the a priori self-concept scales was good for the component of competency for Chinese, maths, and school self-concepts (alphas

= .88, .87, and .80, respectively) and for the component of affect for Chinese, maths, and school self-concepts (alphas = .79, .80, and .77, respectively). The alpha reliability estimate for self-esteem was also good (alpha = .75).

For preliminary construct validation, we conducted principal component analysis with the nine self-concept items for Chinese self-concept with varimax rotation (Green, Salkind, & Akey, 2000). The analysis yielded the two distinct factors as expected, explaining 65.8% of total variance, with factor coefficients ranging from .70 to .82. Principal component analysis with the nine self-concept items for maths self-concept with varimax rotation yielded the two distinct maths factors as expected, explaining 65.2% of total variance, with factor coefficients ranging from .73 to .81. For school self-concept, the analysis yielded the two distinct factors as expected, explaining 57.9% of total variance, with factor coefficients ranging from .64 to .83. These results provided preliminary support for the distinction between the two components of academic self-concepts.

We then tested a series of CFA models. A summary of the goodness of fit for each model is given at Table 1.

Measurement Models

Model 1: Two Chinese self-concept components. Using nine items, Model 1 (Table 1) positing two components of Chinese self-concept provided a good fit to the data (TLI = .96, RNI = .97). The factor coefficients were also good (.51 to .69). The correlation between the two components were significant but were small enough for them to be distinguished from each other (r = .69). Model 1 provided good support for the component specificity of the Chinese self-concept constructs.

Model 2: One Chinese self-concept factor. Using the same nine items as for Model 1, Model 2 positing a single Chinese self-concept did not fit the data as well as Model 1 (TLI = .80, RNI = .85). Comparing Models 1 and 2, there was support for the distinctiveness of the two components of Chinese self-concept.

Model 3: Two Maths self-concept components. Using nine items, Model 3 (Table 1) positing two components of Maths self-concept provided a good fit to the data (TLI = .99, RNI = .99). The factor coefficients were also good (.54 to .82). The correlation between the two components were significant but were small enough for them to be distinguished from each other (r = .70). Thus Model 3 provided good support for the component specificity of the Maths self-concept constructs.

Model 4: One Maths self-concept factor. Using the same nine items as for Model 3, Model 4 positing a single Maths self-concept did not fit the data as well as Model 3 (TLI = .82, RNI = .87). Comparing Models 3 and 4, there was support for the distinctiveness of the two components of Maths self-concept.

Model 5: Two School self-concept components. Again using nine items, Model 4 (Table 1) positing two components of School self-concept provided a good fit to the data (TLI = .94, RNI = .96). The factor coefficients were also good (.50 to .83). The correlation between the two components were significant but were small enough for them to be distinguished from each other (r = .45). Thus Model 5 provided good support for the component specificity of the School self-concept constructs.

Model 6: One School self-concept factor. Model 4 positing a single School self-concept did not fit the data as well as Model 5 (TLI = .58, RNI = .69). Comparing

Models 5 and 6, there was support for the distinctiveness of the two components of School self-concept. Thus Models 1 to 6 have provided support for the construct validity and distinctiveness of the two components for Chinese, maths, and school self-concepts.

Model 7: Validation of nine factors. Model 7 provided a vigorous test of the construct validity of the a priori factors together with the domain-specific achievement scores. Model 7 positing nine factors (Chinese achievement, maths achievement, Chinese self-concept of competency, Chinese self-concept of affect, Maths self-concept of competency, Maths self-concept of affect, School self-concept of competency, School self-concept of affect, and Self-esteem) did not provide a very good fit to the data (TLI = .86, RNI = .88). However, the factor coefficients were good (.51 to .85). The correlations among the factors ranged from -.13 to .79, showing that the factors were distinguishable from each other.

Model 8: Validation of nine factors with correlated uniquenesses. Model 8 differed from Model 7 in that Model 8 included correlated uniquenesses for the parallel items in the Chinese, Maths, and School constructs. Because there were nine items for each domain, there were a total of 27 correlated uniquenesses included in the model. Model 8 provided a very good fit to the data (TLI = .95, RNI = .96). The factor coefficients were also good (.50 to .85). The correlations among the factors ranged from -.14 to .78, showing that the factors were distinguishable from each other. Thus apart from the improved model fit, the parameter estimates were almost identical to Model 7. These results provided support for the validity and distinctiveness of the a priori constructs, and therefore support for specificity both in terms of curriculum domains and of components of self-concept.

Path Models

Model 9: Paths from achievement to domain-specific self-concepts. Model 9 examined the applicability of the I/E model with the domain-specific self-concepts in two components. Model 9 (Table 1) provided a good fit to the data (TLI = .97, RNI = .98). The factor coefficients were also good (all > .50) and the correlations among factors were reasonable (all < .80). Support for the I/E model requires the critical paths from achievement to self-concept components for matching domains to be positive and those for nonmatching domains to be non-positive. An inspection of the path coefficients (Figure 1) found that the paths from Chinese achievement to both components of Competency and Affect of Chinese self-concept were significantly positive (βs = .36 and .21, respectively) but the paths to the respective components of the nonmatching maths domain were negative or close to zero (βs = -.14 and .03, respectively). Similarly, the paths from maths achievement to both components of Competency and Affect of Maths self-concept were significantly positive (βs = .62 and .39, respectively) but the paths to the respective components of the nonmatching Chinese domain were significantly negative (βs = -.22 and -.23, respectively). Hence, the positive paths for the matching domain together with the non-positive paths for the nonmatching domains have provided good support for the I/E model not only for the well-documented Competency component but also for the Affect component of self-concept.

Model 10: Full model. Model 10 is a model equivalent to Model 8 with nine factors. Model 10 examined (a) the applicability of the I/E model with the domain-specific self-concepts in two components as in Model 9, (b) the specificity of the components of self-concepts in two specific subject domains, and (c) the differential impacts of the two components of school self-concept on self-esteem. The critical paths were therefore (a) those paths from achievement scores to the components of self-concept in their matching subject domains, (b) those paths from the two components of self-concepts of each subject domain to the matching component of School self-concept, and (c) the paths from each component of School self-concept to Self-esteem. Like Model 8, Model 10 (Table 1) included 27 correlated uniquenesses. The model provided a good fit to the data (TLI = .95, RNI = .96). The parameter estimates and factor correlations were identical to those in Model 8. The solution of

Model 10 is presented in Table 2 and the critical paths are presented in Figure 2. The paths from Chinese achievement to both components of Competency and Affect of Chinese self-concept were significantly positive (βs = .36 and .20, respectively) but the paths to the respective components of the nonmatching maths domain were negative or close to zero. Similarly, the paths from maths achievement to both components of Competency and Affect of Maths self-concept were significantly positive (βs = .62 and .39, respectively) but the paths to the respective components of the nonmatching Chinese domain were negative. As reported earlier, these results provided support for the I/E model for both components of self-concept.

Furthermore, the paths from the Competency components of Chinese and Maths self-concepts to the Competency component of School self-concept were both significant (βs = .58 and .57, respectively) and the paths from the Affect components of Chinese and Maths self-concept to the Affect component of School self-concept were also significant (βs = .70 and .43, respectively). In contrast, all the paths for nonmatching components were non-positive. These results provided support for the component specificity of the students' academic self-concepts. In comparing the association of the Competency and the Affect components of School self-concept with Self-esteem (Table 2), it was found that although both components of School self-concept were positively correlated with Self-esteem (*r*s = .78 and .37, respectively), the path from the Competency component of School self-concept to Self-esteem was substantially positive (β = .92) but the path from the Affect component of School self-concept to Self-esteem was negative (β = -.10). These results show that the Competency component of School self-concept tended to have a much stronger impact on the students' development of self-esteem than did the Affect component of School self-concept.

Table 2. *CFA Solution for Model 10*

Item/Factor	CHIMARK	MATMARK	CHICOM	CHIAFF	MATCOM	MATAFF	SCHCOM	SCHAFF	ESTEEM
Factor Loadings									
Item 1	1.00*	1.00*	.80*	.77*	.78*	.70*	.68*	.82*	.52*
Item 2	--	--	.75*	.77*	.76*	.75*	.76*	.71*	.54*
Item 3	--	--	.68*	.54*	.70*	.53*	.53*	.50*	.57*
Item 4	--	--	.85*	.75*	.79*	.83*	.77*	.70*	.65*

Item 5	--	--	.75*	--	.80*	--	.65*	--	.66*
Item 6	--	--	--	--	--	--	--	--	.60*
Uniquenesses									
Item 1	0.00	0.00	.36*	.41*	.39*	.50*	.54*	.33*	.73*
Item 2	--	--	.44*	.41*	.43*	.44*	.42*	.49*	.71*
Item 3	--	--	.53*	.71*	.51*	.72*	.73*	.77*	.68*
Item 4	--	--	.28*	.44*	.37*	.31*	.41*	.51*	.58*
Item 5	--	--	.43*	--	.37*	--	.58*	--	.56*
Item 6	--	--	--	--	--	--	--	--	.64*
Paths (From column to row variables)									
CHICOM	.36*	-.22*	--	--	--	--	--	--	--
CHIAFF	.20*	-.22*	--	--	--	--	--	--	--
MATCOM	-.13*	.62*	--	--	--	--	--	--	--
MATAFF	-.04	.39*	--	--	--	--	--	--	--
SCHCOM	.14*	-.06	.58*	.02	.57*	-.01	--	--	--
SCHAFF	.00	.01	-.13*	.70*	-.01	.43*	--	--	--
ESTEEM	-.04	-.01	-.07	.08	-.20	.14	.92*	-.10	--
Correlations									
CHIMARK	--								
MATMARK	.44*	--							
CHICOM	.27*	-.06	--						
CHIAFF	.11*	-.14*	.68*	--					
MATCOM	.14*	.56*	.13*	.05	--				
MATAFF	.13*	.37*	.12*	.30*	.69*	--			
SCHCOM	.34*	.28*	.71*	.46*	.63*	.46*	--		
SCHAFF	.10*	.09	.40*	.74*	.32*	.63*	.45*	--	
ESTEEM	.24*	.16*	.58*	.41*	.43*	.37*	.78*	.37*	--
Residuals	1	1	.89*	.95*	.67*	.86*	.19*	.26*	.37*

Note: $N = 580$. Parameter estimates are completely standardized. *$p < .05$. Responses to items ranged from 1 (strongly agree) to 5 (strongly disagree) and were coded such that higher scores reflected more favourable responses. The uniqueness of each item is the residual variance associated uniquely with that item and is independent of residual variances associated with other measured variables.

Discussion

The present study attempted to (a) replicate previous research findings in support of the domain specificity and specifically the I/E model of self-concepts found in the Western school setting with a sample of Chinese students, (b) test the distinctiveness of the two components of self-concept (competency and affect) within the specific curriculum domains of Chinese and maths, and (c) examine the paths from each of the two components of school self-concept to self-esteem. The results showed that (a) the I/E model was not only applicable to the present sample, but it was also applicable for both the competency and affect components, (b) whereas the competency and affect components were domain specific, the two components were distinctive within each curriculum domain, and (c) the competency component of school self-concept had much stronger effects than did the affect component in contributing to the formation of self-esteem.

Support for the Marsh (1986) I/E model here in the Chinese school context implies that like students in the Western school settings, Chinese students undergo a similar social comparison process in which they compare their achievement in each curriculum domain with their peers but at the same time also compare internally their own achievements in different curriculum domains. Hence, higher achievement than other students in Chinese tends to lead to higher self-concept in Chinese and higher achievement in maths tends to lead to higher self-concept in maths. However, higher achievement in Chinese would make the student feel that he or she is not as good in

maths whereas higher achievement in maths would make him or her feel weaker in Chinese. Therefore, the results have reinforced the findings of previous studies in terms of domain specificity and Marsh's (1986) I/E model (e.g., Lee, Yeung, Low, & Jin, 2000; Marsh, Kong, & Hau, 2001; Skaalvik & Rankin, 1995; Tay, Licht, & Tate, 1995; Yeung, Chow, Chow, Luk, & Wong, 2004; Yeung & Lee, 1999).

Furthermore, an interesting extension of previous findings was that this I/E phenomenon may not be limited to social comparison. The internal-external process seems to apply also to the students' affect toward each curriculum domain. Hence, the more a student likes Chinese, the less the student would like maths whereas having a higher preference for maths would mean a lower preference for Chinese. These results imply great challenges to the educators as to how to enhance and maintain the students' self-concepts when both components of competency and affect need to be taken into consideration.

A major focus of the present investigation was the distinctiveness of the competency and affect components of self-concept. The results have not only clearly supported the suggestion of Marsh, Craven, and Debus (1999) of the separation of the two components of academic self-concept, but have also extended their findings to each specific domain. The distinctiveness of the two components within each curriculum domain has important implications for educators. Whereas higher achievement in Chinese would lead to a higher sense of competency in Chinese and a higher preference for Chinese, the achievement in Chinese would not have any positive effect on maths self-concepts, neither in terms of competency nor in terms of affect. Similarly, maths achievement would not have any positive effect on either components of Chinese self-concept. In other words, it would be a waste of effort if we attempt to motivate a student in a certain curriculum area and hope that the student would be similarly motivated in other curriculum areas.

The paths from the two curriculum domains to general school self-concept clearly showed the distinctiveness of the two components of self-concept. Whereas the competency component for both Chinese and maths had positive effects on school competency, the affect component for both domains had positive effects only on the affect component of school self-concept. This finding has even more important implications for educators in the school setting. By improving students' self-concepts of competency in various curriculum domains, we could expect to improve their overall sense of competency in their schoolwork in a general sense, but we should not expect that they would like schoolwork any more than they did. Conversely, by motivating students in various curriculum domains, we could expect them to like school more but we may not be able to improve their sense of competency overall.

The finding of differential effects of the two components of school self-concept on self-esteem is most interesting. It may not be surprising that a higher sense of competency in schoolwork would lead to a student's higher self-esteem, but whether a student would like schoolwork does not seem to have any influence on self-esteem. Marsh and Yeung (1999) have demonstrated that when asked about their self-esteem in a specific context, survey respondents would tend to supply responses in relation to that context. Hence it may not be surprising that the students' responses on self-esteem

tended to be more academic because the items were asked in the context of academic self-concept. However, although the affect component of school self-concept was positively correlated with self-esteem (r = .37), the path from this affect component to self-esteem was not positive (βs = -.10). This result indicated that the competency component had much stronger effects on self-esteem than did the affect component. This finding may be taken as reinforcement of recent research on self-concept, which emphasizes the domain specificity of self-concept.

Nevertheless, whereas the importance of domain specificity should be emphasized because there is evidence that the self-esteem construct may not be sufficient to embrace an individual's self-concepts in various areas, the separation of the competency and affect components of self-concept should also be emphasized because the competency component alone (such as the competency-type items in Marsh's (1990) ASDQ) may not be sufficient to embrace the students' self-concepts in each curriculum domain. Further work is necessary to examine whether the separation of the two components would be applicable to other samples. It is also essential to examine especially the potential effects of the affect component on educational outcomes. Otherwise, it would be unclear why educators would need to make students feel like the school subjects they learn without really achieving any valuable outcome they would like to see.

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Appendix
Self-concept Scales in the Present Study

	Chinese	Math	School
Alpha Reliabilities of Competency Scales	.88	.87	.80
1. I often get good marks in (domain).			
2. I do things well in (domain).			
3. Work in (domain) is easy for me.			
4. I have always done well in (domain).			
5. I learn things quickly in (domain).			
Alpha Reliabilities of Affect Scales	.79	.80	.77
1. I look forward to lessons in (domain).			
2. Lessons in (domain) are enjoyable.			
3. I wish I wouldn't need to do any classes in (domain).			
4. I like (domain) lessons.			
Alpha Reliabilities of Esteem Scale	.75		
1. Overall, I'm no good.			
2. I can do things as well as others.			
3. Most things I do are worthwhile.			
4. I deserve respect from others.			
5. Overall, I have a lot to be proud of.			
6. Most things I do I do well.			

Note: The wording of items in the competency and affect scales was parallel across two subject domains and school self-concept. Thus "I do things well in (domain)" read as "I do things well in Chinese" for Chinese competency, as "I do things well in math" for math competency, and as "I do things well in most school subjects" for School self-concept. The responses ranged from 1 (strongly disagree) to 5 (strongly agree) and were coded such that higher scores reflected more favourable responses.

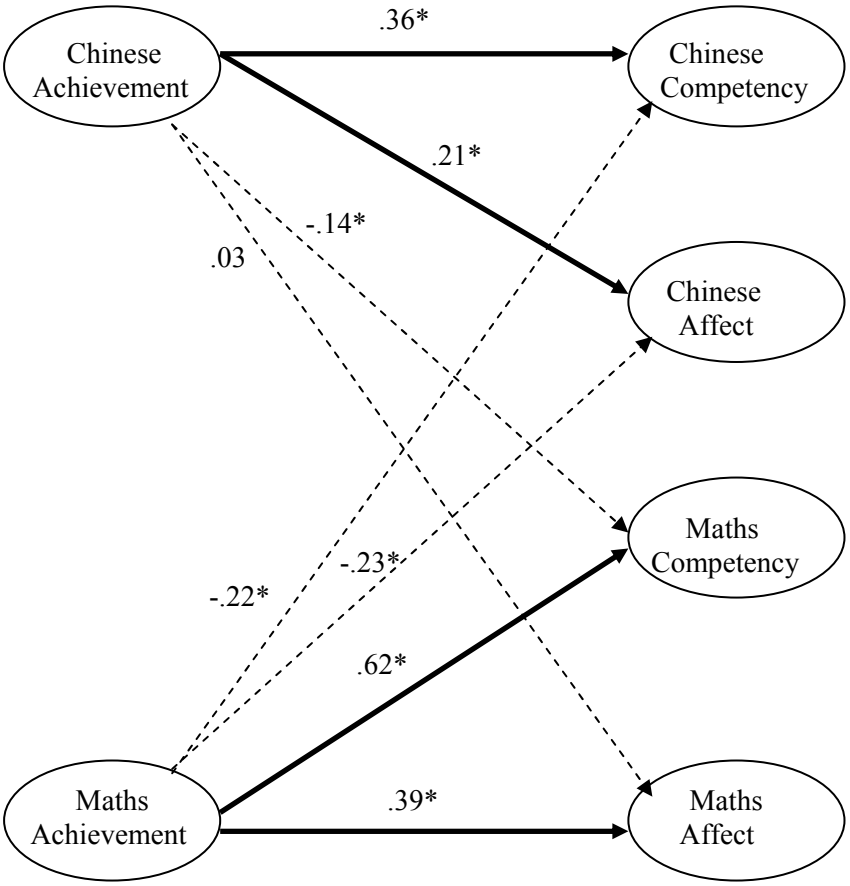

Figure 1. Model 9 testing the internal-external frame of reference hypothesis.

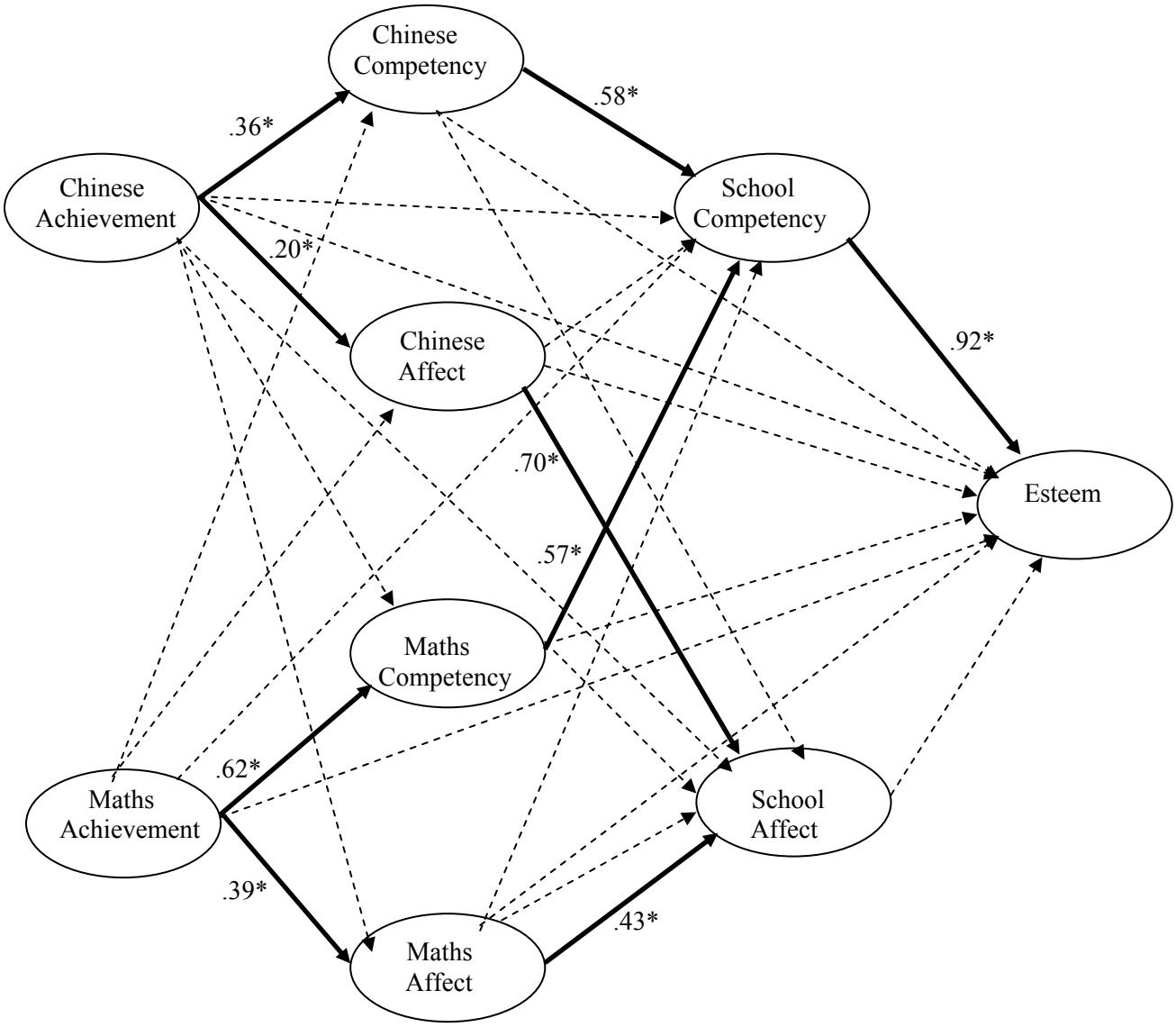

Figure 2. Model 10 testing the component-specific relations.