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**Self-concept and Academic Motivation of
Chinese Students in Hong Kong**

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We examined the frame-of-reference effects of potentially important self-constructs (e.g., self-concepts, values, goals) among Grade 7 Hong Kong Chinese students (N=1950). Specifically, the study analysed how the immediate context of schoolmates' ability affected students' perceptions of their own ability. It was postulated that students formulated their self-concept by comparing their own performance (e.g., math achievement) with that of other students (i.e., the external frame) as well as their own performance in other academic areas (e.g., language; the internal frame). This would have negative effects on the self-concept of students studying in schools with high average student ability (big-fish-little-pond effects, BFLPE). In this study, we explored how other individual difference attributes moderate the frame-of-reference effects on self-concept. Results showed that in general stronger mastery goal, persistence strategies, and utility (value) helped to reduce the negative BFLPE, while stronger avoidance goal, and ability attribution (for Mathematics) further increased this negative BFLPE.

High self-concept has been considered both important and desirable to students' learning and development. The enhancement of self-concept is identified as a major focus of concern in various settings, including education and child development (e.g. Marsh & Craven, 1997). Thus, educational policy statements throughout the world list self-concept enhancement as a central goal of education and an important vehicle for addressing social inequities experienced by disadvantaged groups. For example, in their model of effective schools, Brookover and Lezotte (1979) proposed academic self-concept, self-reliance, and academic achievement as the major outcome variables for schools to foster in their students. In addition to being an important outcome variable, self-concept is an important mediating construct that facilitates the attainment of other desirable psychological and behavioral outcomes.

From a social-cognition perspective, self-concept is a 'hot' variable that makes things happen. The need to think and feel positively about oneself and the profound benefits of these positive cognitions for choice, planning, and subsequent accomplishments transcend traditional disciplinary barriers and are central to goals in many social policy areas. More generally, individuals in all walks of life are likely to accomplish more if they feel competent in what they do, are self-confident, and feel positively about themselves. Programs or societal changes that undermine self-concepts are also likely to have negative effects on accomplishments.

These basic ideas can easily be translated into many different disciplines. Thus, for example, Marsh (2002) reported that physical self-concept contributed to the prediction of the performances of elite swimmers at international events beyond what could be explained in terms of their previous performances (personal bests and international rankings). In an organizational setting, Parker (1998) summarized research showing that employees who feel more able to perform particular tasks will actually perform better on these tasks, will persist in the face of adversity, and will cope more effectively with change. Judge and Bono (2001) presented a meta-analysis showing that components of a positive self-concept construct were among the best predictors of job performance and job satisfaction. Marsh, Byrne, and Yeung (1999) reviewed educational research showing that prior academic self-concept had a positive effect on subsequent academic achievement (school grades and standardized test scores) beyond what could be explained by prior levels of academic achievement.

Historically, self-concept research has focused on a relatively unidimensional global component of self. More recently, however, researchers have emphasized the multidimensionality of self-concept and the

specific components of self-concept most appropriate to a particular setting. Because the same person can have a positive self-concept in one domain (e.g., social) and a negative self-concept in another domain (e.g., academic), global measures cannot adequately describe self-concepts in different domains. Particularly if researchers are concerned with outcomes in a particular domain, measures of global self-concept and self-concepts in other domains may be of limited relevance. Thus, for example, academic self-concept is especially important in the educational settings and the educational psychology research that are the focus of the present investigation.

Self-concept research continues to emphasize that self-concept cannot be adequately understood if the role of frames of reference is ignored. The same objective characteristics and accomplishments can lead to disparate self-concepts depending on the frames of reference or standards of comparison that individuals use to evaluate themselves. Whereas this phenomenon is evident in many different domains, the focus of the present investigation is academic self-concept in educational settings. According to the big-fish–little-pond effect (BFLPE), an individual student's academic self-concept is based partly on the academic achievement levels of the individual student and partly on the average of achievement levels of other students in the same school that the student attends.

In the present investigation we demonstrate how students' self-concept is negatively affected by the mean achievement of the school. More importantly, we explore how such negative BFLPE could be reduced by certain students' individual attributes (e.g., learning goals). For schools, particularly those competitive and prestigious schools admitting a lot of high achievers, the negative BFLPE is always a great concern for the teachers and school administrators. Thus, the finding of individual differences or classroom context factors that can reduce or moderate such negative BFLPE will be useful. In this research, we explore the existence of such moderator variables.

Importance of Academic Self-Concept in Educational Settings

The emphasis on the multidimensionality of self-concept is particularly important in educational settings. Whereas academic achievement, persistence, coursework selection, and long-term educational aspirations are systematically related to academic self-concept, they are nearly uncorrelated (or even negatively related) to nonacademic (social and physical) self-concept responses (e.g., Byrne, 1996a; Hattie, 1992; Marsh, 1990, 1993; Marsh & Craven, 1997; Marsh & Yeung, 1997a, 1997b, 1998).

Theoretical models of the relations among self-cognitions, behavior, and subsequent attainment suggest that such changes in academic self-perceptions may affect academic choices, academic effort, and subsequent achievement (Bandura, 1986; Marsh & Craven, 1997). In particular, important research has focused on disentangling the causal ordering of academic self-concept and academic achievement (see Marsh & Craven, 1997; Marsh et al., 1999). Whereas researchers recognize academic self-concept as an important outcome variable in its own right, much of the interest in the self-concept and 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. According to the self-enhancement model, self-concept is a primary determinant of academic achievement, thus supporting self-concept enhancement interventions that are explicit or implicit in many educational programs.

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 multiple occasions. Hence, the theoretical question is what comes first: academic self-concept (how I think and feel about myself academically) or academic achievement (how well I perform in academic settings)? Not surprisingly, either-or answers to this question are too simplistic, and a growing body of research supports a reciprocal effects model in which academic self-concept both affects and is affected by academic achievement (Byrne, 1996; Marsh et al., 1999; Marsh & Yeung, 1997a). Importantly, this research shows that prior academic self-concept has an effect on subsequent academic achievement beyond what can be explained in terms of prior achievement.

Marsh and Yeung (1997b) also evaluated the impact of academic self-concept on future coursework selection. In a longitudinal study, they related students' prior school grades and academic self-concepts in specific school subjects to subsequent decisions about what school subjects were pursued by these same

students. Although academic self-concept and school grades in specific school subjects were substantially correlated, academic self-concepts were better predictors of the school subjects that students subsequently pursued. In related research, Marsh (1991) used the nationally representative U.S. High School and Beyond database to demonstrate that academic self-concept information collected in high school was an important determinant of a student's subsequent decision about whether to attend university.

In summary, previous research in educational settings has demonstrated the importance of considering the multidimensionality of self-concept and the critical relationship between academic self-concept and desirable educational outcomes. This research demonstrated that self-concept has an important influence on students—how they feel about themselves, their accomplishments, persistence, and educational decisions. This research is 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, but 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.

Frame-of-Reference Effects in the Formation of Academic Self-Concept: The BFLPE

Psychologists from the time of William James (1890/1963) have recognized that objective accomplishments are evaluated in relation to frames of reference. Thus James indicated, "We have the paradox of a man shamed to death because he is only the second pugilist or the second oarsman in the world" (p. 310). Social comparison theory (Festinger, 1954) is one approach to studying frame-of-reference effects that has a long history in social psychology and provides the theoretical underpinning for the present investigation. In an educational context, Marsh (1984; Marsh & Parker, 1984) proposed the BFLPE to encapsulate frame-of-reference effects posited in social comparison theory. This study attempts to examine this BFLPE effect as well as to explore potential factors which can reduce this negative BFLPE.

The BFLPE hypothesizes that students compare their own academic achievements with the academic achievements of their peers and use this social comparison impression as one basis for forming their own academic self-concept. Consider a capable student who has been evaluated as a top student throughout primary school. If the student is accepted into an academically selective high school, the student may be average or below average in relation to other students in this school rather than at the top of the class. This can have detrimental effects on the student's academic self-concept as the student is no longer a big fish in a small pond (top of the class) but is in a large pond full of even larger fish (other students who are even brighter), so that this student is average or below average in relation to the achievement levels in this new, academically selective high school.

Case study evidence also supports the underlying processes of the BFLPE (Marsh, 1991). A student named Jane was attending an academically selective Australian high school, but she was doing poorly and not attending school regularly. A change in employment forced her parents to move, and Jane changed to a new high school that was not a selective school. Because of her poor progress at the last school, Jane was initially placed in a class with low-achieving students in the new school. It quickly became evident, however, that she was a high-achieving student, and she soon worked her way into the most advanced classes in the new school. Her parents found that she was taking school more seriously and spending more time on her homework. Jane indicated that at the old (selective) school she had to work really hard to get just average marks that were not worth the effort. However, if she worked hard in her new school, she could be one of the best, which was apparently worth the effort.

The BFLPE is very specific to academic self-concept. Marsh and Parker (1984) and Marsh (1987) showed that there were large negative BFLPEs for academic self-concept but little or no BFLPEs on general self-concept or self-esteem. Marsh, Chessor, Craven, and Roche (1995) reported two studies of the effects of participation in gifted and talented programs on different components of self-concept over time and in relation to a matched comparison group. There was clear evidence for negative BFLPEs in that academic self-concept in the gifted and talented programs declined over time and in relation to the comparison group. These BFLPEs were consistently large for Math, Verbal, and Academic self-concepts but were small and largely nonsignificant for four nonacademic self-concepts and for general esteem.

Theoretical Basis and Implications of the BFLPE

The historical and theoretical underpinnings of this research (see Marsh, 1974, 1984, 1991, 1993; Marsh & Parker, 1984) were derived from research in psychophysical judgment (e.g., Helson, 1964; Marsh, 1974; Parducci, 1995), social judgment (e.g., Morse & Gergen, 1970; Sherif & Sherif, 1969; Upshaw, 1969), sociology (e.g., Alwin & Otto, 1977; Hyman, 1942; Meyer, 1970), social comparison theory (e.g., Festinger, 1954; Suls, 1977), and the theory of relative deprivation (e.g., Davis, 1966; Stouffer, Suchman, DeVinney, Star, & Williams, 1949). In the theoretical model underlying the BFLPE (Marsh, 1984), it is hypothesized that students compare their own academic achievement with the academic achievements of their peers and use this social comparison impression as one basis for forming their own academic self-concept. For example, if students with average levels of achievement attend a high-achievement school (i.e., a school in which the average achievement level of other students is high) such that their academic achievements are below the average of other students in the school, it is predicted that this educational context will foster social comparison processes that will lead to academic self-concepts that are lower than if the same students attended an average-achievement school.

Thus, academic self-concepts depend not only on one's academic accomplishments but also on the accomplishments of those in the school that a student attends. According to this model, academic self-concept will be affected positively with individual achievement (higher achieving children will have higher academic self-concepts). However, academic self-concept should be affected negatively by school-average achievement (equally able students will have lower academic self-concepts in a school in which the average achievement is high and will have higher academic self-concepts in a school in which the average achievement is low).

Empirical support for this negative effect of school-average achievement on academic self-concept (the BFLPE) comes from numerous studies based on a variety of different experimental/analytical approaches (see review by Marsh & Craven, 2001). Davis (1966) previously proposed a theoretical model similar to the BFLPE in a study of career decisions of American college men. He sought support for a theoretical explanation of why the academic quality of a college had such little effect on career choice. Expanding the educational policy implications of his research, Davis (1966) concluded,

Counselors and parents might well consider the drawbacks as well as the advantages of sending a boy to a "fine" college, if, when doing so, it is fairly certain that he will end up in the bottom ranks of his graduating class. The aphorism "It is better to be a big frog in a small pond than a small frog in a big pond" is not perfect advice but it is not trivial. (p. 31)

A theoretically important issue with profound educational implications is the extent to which the BFLPEs vary across different individual student achievement levels. In particular, is the BFLPE limited primarily to the lowest achieving students in academically selective settings (i.e., settings in which the average level of achievement is high), or do the BFLPEs generalize across the achievement continuum?

There is some theoretical and empirical disagreement about this issue. Coleman and Fults (1985), for example, predicted and found that students in the top half of academically selective classes experienced little or no decline in self-concepts. By contrast, Marsh (1984, 1987, 1991, 1993; Marsh et al., 1995; Marsh & Rowe, 1996) argued that attending selective schools should lead to reduced academic self-concepts for students of all achievement levels based on several different theoretical perspectives. For a large, nationally representative (United States) database, Marsh and Rowe (1996) found that the BFLPE was clearly evident for students of all achievement levels and that the size of the BFLPE varied only slightly with individual student achievement. In two studies demonstrating BFLPEs in students attending gifted and talented programs, Marsh et al. (1995) found no significant interaction between the size of the BFLPE and the achievement level of individual students. However, Marsh, Köller, and Baumert (2001) found small interaction effects in their large German study based on three waves of data. Whereas the size of the BFLPE—the negative effect of class-average achievement—did not vary with individual student achievement at any of the three times considered separately, or for self-concept changes between Time 1 and Time 2, the size of this negative effect diminished slightly for the most able students over the three occasions.

Diener and Fujita (1997) related BFLPE research to the broader social comparison literature in which the focus of research is typically not academic self-concept per se. They emphasized that Marsh's BFLPE provided the clearest support for predictions based on social comparison theory in an imposed social comparison paradigm. They also emphasized that the frame of reference, based on classmates within the same school, is more clearly defined than in most other research settings. It is clear that the importance of the school setting and the relevance of the social comparisons in school settings are much more ecologically valid than manipulations in the typical social psychology experiments involving introductory psychology students in contrived settings. Indeed, except for opting out altogether, it is difficult for students to avoid the relevance of achievement as a reference point within a school setting or the social comparisons provided by the academic accomplishments of their classmates.

Following from Diener and Fujita's review, Marsh and Craven (2001) highlighted strong links between social comparison theory and BFLPE research, emphasizing that the BFLPE in educational settings provides an ideal opportunity to evaluate social comparison theory predictions that have broad theoretical implications for many psychology disciplines.

Broader Policy Implications of the BFLPE

The results of the BFLPE are important for understanding the formation of academic self-concept, testing theoretical models based on social comparison theory, and evaluating the effects of frames of reference. However, classroom teachers, policymakers, and parents might ask, "So what?" What are the consequences of attending high-achievement schools for academic outcomes other than academic self-concept? Educators and particularly parents often assume that there are academic benefits associated with attending higher achievement schools. After all, academic achievement, aspirations, and subsequent attainment are typically higher in these schools. This naive analysis, however, fails to account for the initially higher achievement levels and other preexisting differences of students who attend academically selective high schools. A better test would be to compare academic outcomes after controlling the preexisting differences.

Marsh (1991) considered the influence of school-average achievement on a much wider array of outcomes in a very large, nationally representative, longitudinal study of U.S. high school students. In this High School and Beyond Study, 36 students each from 1,000 high schools were surveyed in Year 10 (Time 1), Year 12 (Time 2), and again two years after graduation from high school (Time 3). The outcomes in this study included most of the important outcomes of education. After background and initial achievement were controlled for, the effects of school-average achievement were negative for almost all of the Year 10, Year 12, and postsecondary outcomes: 15 of the 17 effects were significantly negative and 2 were nonsignificant. School-average achievement most negatively affected academic self-concept (the BFLPE) and educational aspirations, but school-average achievement also negatively affected general self-concept, selection of advanced coursework, school grades, standardized test scores, occupational aspirations, and subsequent college attendance.

Even after controlling for all Year 10 outcomes, school-average achievement negatively affected many subsequent outcomes. This implies that school-average achievement continued to affect negatively Year 12 and postsecondary outcomes beyond the negative effects experienced at Year 10. Consistent with the proposal that these negative effects were substantially mediated by academic self-concept, controlling for the negative effects of school-average achievement on academic self-concept substantially reduced the size of negative effects on other outcomes.

The focus of BFLPE research has been on the negative effects that achievement segregation has on academically gifted students, but the theoretical basis of the BFLPE has important policy implications for the placement of learning disadvantaged students as well (see also Robinson, Zigler, & Gallagher, 2000). Tracey, Marsh and Craven (2003) extended this research to focus on BFLPE predictions for special classes for academically disadvantaged students (also see Chapman, 1988; Marsh & Johnston, 1993). They studied 211 special education students in Grades 2–6 who had learning difficulties (IQ of 56 to 75). These students were either in regular classroom settings or in full-time special education classes with other students who had learning difficulties. Consistent with BFLPE predictions, students in full-time special education classes had significantly higher self-concepts for all three academic scales (Reading, Math, School) but did not differ

significantly from other special education students in regular classes for Parents, Physical Ability, and Physical Appearance self-concepts. Somewhat unexpectedly, students in the special education classes also had significantly higher Peer self-concepts.

Cross-Cultural Support for the BFLPE

Cross-cultural comparisons provide researchers with a valuable, heuristic basis to test the external validity and generalizability of their measures, theories, and models. Matsumoto (2001) argued, "Cultural differences challenge mainstream theoretical notions about the nature of people and force us to rethink basic theories of personality, perception, cognition, emotion, development, social psychology, and the like in fundamental and profound ways" (p. 9).

In their influential overview of cross-cultural research, Segall, Lonner, and Berry (1998) emphasized that cross-cultural research's three complementary goals were to transport and test our current psychological knowledge and perspectives by using them in other cultures; to explore and discover new aspects of the phenomenon being studied in local cultural terms; and to integrate what has been learned from these first two approaches in order to generate more nearly universal psychology, one that has pan-human validity (p. 1102). Similarly, Sue (1999) argued that researchers have not taken sufficient advantage of cross-cultural comparisons that allow them to test the external validity of their interpretations and to gain insights about the applicability of their theories and models. From this perspective, it is important to note that there is clear support for the BFLPE outside Australia and the United States, countries that have been the basis for most of this research. Jerusalem (1984) examined the self-concepts of West German students who moved from nonselective, primary schools to secondary schools in which selection was based on academic achievement. At the transition point, students who were selected to enter the high-achievement schools had substantially higher academic self-concepts than did those entering the low-achievement schools. However, by the end of the first year in the new schools, no differences in academic self-concepts were present for the two groups. Path analyses indicated that the direct influence of school type on academic self-concept was negative. The most able students in the low-achievement schools were less able, but had much higher academic self-concepts, than the least able children in the high-achievement schools.

In 1991, former East and West German students experienced a remarkable social experiment—the reunification of very different school systems after the fall of the Berlin Wall. Self-concepts were collected at the start, middle, and end of the first school year after reunification (Marsh et al., 2001). East German students had *not* previously been grouped according to achievement. For them, the BFLPE was initially small, then moderate, and then substantial by the end of the year. West German students had attended schools based on achievement grouping for the two years prior to the reunification. For them, the BFLPE was substantial at all three times. A large East–West difference in the size of the BFLPE at the start of the year disappeared completely by the end of the year. The evolution of the BFLPE in the East and West German settings supported the social comparison process posited to underlie the BFLPE and its cross-cultural generalizability.

In Hong Kong, schools are more highly segregated in relation to achievement than anywhere else in the world. However, collectivist cultural values prevail that are posited to counter social comparison processes (compared with more individualistic values in most Western countries). Marsh, Kong, and Hau (2000) followed a large, nationally representative sample of Grade 7 students through high school (7,997 students in 44 high schools followed for four years) based on a Chinese translation of the Self-Description Questionnaire II (SDQII). Consistent with the BFLPE, school-average achievement (based on measures collected in Grade 6, prior to the start of high school) had negative effects on academic self-concept in Grades 8 and 9. The sizes of these effects ($bs = -.22$ to $-.24$) were similar to those found in U.S. studies based on nationally representative samples. Even after controlling for the negative effect in Grade 8, there was an additional negative effect in Grade 9 (beyond those already experienced in Grade 8).

Zeidner and Schleyer (1999) tested the BFLPE in a large-scale study based on a nationally representative sample ($N=1,020$) of Israeli gifted students participating in either special homogeneous classes for the gifted or mixed-achievement classes. Path analyses indicated that gifted students in mixed-achievement classes evidenced markedly higher academic self-concepts, lower anxiety, and higher school grades than did gifted students in specialized classes.

Replication of the BFLPE in different countries provides strong support for its cross-cultural generalizability. In support of this theoretical model, Marsh and Craven (2003) summarized results from a diverse range of studies using different samples and methodological approaches showing that: (a) educationally disadvantaged students have higher academic self-concepts in special education classes than in regular mixed-ability (mainstreamed) classes, whereas (b) academically gifted students have higher academic self-concepts in regular, mixed-ability classes than in specialized education settings for gifted students. Hence, academic achievement measured at the individual child level has a positive effect on academic self-concept (i.e., one's own high levels of individual achievement lead to high self-concept) whereas the academic achievement measured at the group level has a negative effect (i.e., high average school achievement leads to low self-concept).

Marsh and Hau (2003) conducted the most comprehensive cross-cultural study of the BFLPE, based on nationally representative samples of approximately 4,000, 15-year olds from each of 26 countries (103,558 students, 3,848 schools, 26 countries), who completed the same self-concept instrument and achievement tests. Consistent with the BFLPE, the effects of school-average achievement were negative in all 26 countries ($M = -.20$, $SD = .08$). Results of their three-level multilevel model (level 1 = students, level 2 = schools, level 3 = country) indicated that the effects of individual achievement were positive (linear term = .384, quadratic term = .069), whereas the effects of school-average achievement—the BFLPE—were negative (-.206). The interaction between individual student achievement and school-average achievement was not significant, indicating that the negative effect of school-average achievement was consistent across the range of student achievement levels. Variation on the school-average achievement effect (.007) was small, but highly significant—indicating that there was statistically significant variation from country to country in the size of the BFLPE. In separate analyses of each of the 26 countries, the BFLPE varied from -.02 to -.36 and was significantly negative in 24 of 26 countries. In each of the 26 countries, the effect of individual achievement on academic self-concept (.14 to .63; Mean = .38, $SD = .11$) was significantly positive. The averages across results from the separate two-level models for each of the 26 countries agreed closely with those from the three-level analyses for the total group. Support for the generalizability of the BFLPE across countries suggested that the social comparison processes leading to the BFLPE may approach what Segall et al. (1998, p. 1102) refer to as a “nearly universal psychology, one that has pan-human validity”—one goal of cross-cultural research.

A framework for the assessment of Students' Approaches to Learning

In the present study, we explore a number of individual difference variables used in PISA that are potential moderators of BFLPE (Artelt, in press; Artelt et al., 2000; Baumert, Fend, O'Neil, & Peschar, 1998; Peschar, 2004). These individual difference attributes, broadly labeled as self-regulated learning variables, are considered as desirable traits for learning. Students who are capable of effective learning are able to choose appropriate learning goals, use the appropriate knowledge and skills to direct their learning, and select self-regulated learning strategies appropriate to the task at hand. They are able to regulate their learning and take responsibility for the acquisition and maintenance of new skills. There is a broad consensus at the descriptive level of what it is that distinguishes self-regulated learners from those who need more external regulation. Those processes are cognitive, motivational and metacognitive in nature (see also Boekaerts, 1999, Zimmerman & Schunk, 2001).

According to Zimmerman (1989): “Students can be described as self-regulated to the degree that they are metacognitively, motivationally, and behaviourally active participants in their own learning process” (p. 4). According to this theory, self-regulated learners have the motivational advantage of high levels of self-efficacy and intrinsic motivation. On the behavioural (strategic) level, self-regulated learners actively select, structure, and create social and material environments that optimize their learning processes. Extensive planning, organizing, and evaluating characterize the metacognitive activities of self-regulated learners. Thus, self-regulated learning is a goal-directed process of active and constructive acquisition of knowledge. A central feature of self-regulation is the guided interaction of an individual's cognitive, metacognitive and motivational resources.

Weinert (1994) defined self-regulated, successful approaches to learning in a similar way. According to him these are dependent not only on the existence of a repertoire of cognitive and metacognitive

information-processing strategies but also on the readiness of individuals to define their own goals, to be proactive, to interpret success and failure appropriately, to translate wishes into intentions and plans, and to shield learning from competing intentions. Similarly, according to Simons (1992): (a) learning must be prepared (e.g., prior knowledge activated, goals defined, the relevance of goals made clear), (b) learning-related actions must be executed (e.g., the cognitive strategies and processes necessary for understanding, retention, and transfer activated), (c) the learning process must be regulated by means of control and intervention strategies, (d) outcomes must be assessed (e.g., by self-evaluation of achievement), and (e) motivation and concentration must be maintained.

As described by Boekaerts (1997), self-regulated learning is a complex, interactive process involving motivational as well as cognitive self-regulation. Her model was used as a theoretical framework for the selection and development of the constructs in PISA and the present study. In this model, cognitive and motivational self-regulation is represented by three levels; goals, strategies, and domain-specific knowledge. Each component must be available to a learner in order for self-regulated learning to occur. The model thus describes the relations between different types of knowledge, strategy use, and goals. It allows teachers and researchers to specify the preconditions for self-regulated learning in specific courses or tasks, as well as to describe which aspects of self-regulated learning the learner has already mastered in a given domain, which aspects are still lacking, and where the learner still needs further support. In this respect, it is a diagnostic model that can be used to direct teaching and research on teaching. Boekaerts (1997, 1999) emphasized the mutual dependency of the components of self-regulated learning. Students' motivation to learn, for example, has a profound impact on their choice of learning strategies, whereas knowledge about learning strategies is dependent on prior knowledge in the respective content domain. Knowledge deficits in one part can impede or prohibit self-regulated learning.

Because the focus in these constructs is on the assessment of students' capacity for, or possession of the prerequisites of, effective learning, student characteristics that are typical of effective approaches to learning are assessed individually (Artelt, Baument, Julius-McElvany, & Peschar, 2003). These are students' tendencies to use learning strategies to control their learning, as well as their motivation and self-efficiency beliefs. A preference for certain learning strategies, coupled with particular self-beliefs and motivations constitutes an approach to learning. By the age of 15, students' knowledge about their own learning and their ability to give valid answers to questionnaire items has developed considerably (Schneider, 1996) so that students' characteristics or approaches to learning can be measured with a self-report questionnaire. Students' approaches to learning in general cannot necessarily be equated with current learning behavior or with their adaptation and self-regulation during a specific learning episode. Nevertheless, students' approaches to learning do reflect potential strengths and weaknesses in current learning. In the present study, we investigated whether these desirable individual self-regulated approaches can reduce the negative BFLPE or not.

Measures and Constructs

An adapted version of Boekaert's (1997) model of self-regulated learning was used as the basis for the assessment of students' approaches to learning in PISA. In measuring the necessary prerequisites for self-regulated learning (12 scales), PISA concentrates on the assessment of cognitive and metacognitive learning strategies (Elaboration Strategies, Memorization Strategies, Control Strategies), motivational preferences (Interest in Reading, Interest in Mathematics, Instrumental Motivation, Effort and Persistence in Learning), and self-related cognitions and beliefs (Verbal Self-concept, Math Self-concept, Academic self-concept, Self efficacy, and Control Expectations). Additionally, two scales measuring students' preferences for learning situations (Owens & Barnes, 1992) were assessed. These are not direct preferences for effective self-regulation, but instead, conditions under which self-regulated learning takes place (see below).

Motivational preferences and volition: interest in reading, interest in mathematics, instrumental motivation, effort and persistence in learning. A central requirement of effective learning is motivation to learn. Motivation can be regarded as the driving force behind learning. Two SAL scales measure intrinsic motivation as represented by domain-specific interest (interest in reading and interest in mathematics). A third scale is aimed at assessing students' instrumental motivation, and a fourth scale measures a volitional process, namely their effort and persistence in learning. From the perspective of developmental psychology,

Deci and Ryan (1985) have devised a theory of learning motivation that differentiates between extrinsic and intrinsic motivation. The attributes “external” versus “internal” refer to the loci of motivation. Extrinsically motivated students pursue learning goals associated with consequences located outside the person, such as positive feedback or rewards for good performance. Instrumental motivation is an example of primarily extrinsically motivated behavior. Longitudinal studies (Eccles, 1994; Eccles & Wigfield, 1995; Wigfield, Eccles, & Rodriguez, 1998) have found that career-related instrumental motivation is an important predictor of course selection, choices of college major, and performance.

Intrinsically motivated learners, by contrast, are motivated by internal rather than external incentives. They might, for example, learn in order to find out more about a subject domain or to achieve the positive emotional state that learning can engender (Csikszentmihalyi, 1990). Interest is a classic example of intrinsic motivation (Renninger, Hidi & Krapp, 1992). Interest is a relatively stable evaluative orientation towards certain topics or domains. It is often accompanied by positive feelings (e.g., feelings of involvement or stimulation) and attribution of personal significance to an object or domain. Subject-specific interest affects the intensity and continuity of engagement in learning situations, the selection of learning strategies, and the depth of understanding achieved (Schiefele, 2001).

A scale measuring effort and persistence in learning (i.e., a volitional aspect), complements the three motivational scales. Volition is concerned with the control processes activated shortly before and during the actual performance of the action. During the volitional phase, priority is given to students’ effort and persistence during learning (O’Neil & Herl, 1998).

Preference for Learning Situations: Cooperative and Competitive Learning Preferences

Self-regulated learning involves the ability to learn both independently and in groups (cf. Baumert et al., 1998). In the context of lifelong learning, the acquisition of knowledge will increasingly occur in situations in which people work together and are dependent on one another. A preference for either cooperative or competitive learning is not a necessary precondition for the self-regulation of learning. Both motives are compatible with effective self-regulated learning. However, the extent to which students voice a preference for cooperative or for competitive learning might give some indication of the approach they will take to cooperative projects in working life. A typical item for measuring the preference for cooperative learning would be: I learn the most when I work with other students.

Reducing the Negative BFLPE

The negative effects of school-average achievement in previous studies of BFLPE represented an average, across responses by all subjects attending a large number of schools. Hence, an important direction of research as pointed out by Marsh and Hau (2003) is the identification of individual-level and school-level characteristics that can moderate or reduce the negative BFLPE. In particular, it would be most useful “to identify student characteristics that will predict students who may benefit from academically selective schools and to evaluate school policies that maximize benefits” (Marsh & Hau, 2003, p. 375).

Though seldom demonstrated through empirical data, we believe the damaging effects of the BFLPE on self-concept can be reduced if students are taught to concentrate more on their own performance than to compare their own performance with others (Marsh & Hau, 2003). That is, students in a school surrounded by higher achievers would be less defeated on their self-concept if they concentrate more on their own improvement. Particularly in the more recent formulation of the expectancy-value theory (Eccles and Wigfield, 2002) that encapsulates a much broader array of psychological and social/cultural determinants of students’ motivation, the analyses of the interplay among these situational and individual difference constructs are important. In the present study, we examined a wide range of potential moderator variables on BFLPE as measured in a large-scale study.

Method

Participants

The participants were N=1950 Grade 7 Chinese students in Hong Kong. They came from diversified school settings and were highly varied in level of averaged within-school competitiveness.

Measures

Self-related Constructs

Students filled in a questionnaire measuring a wide range of self-related constructs:

- (i) Expectancy related constructs: self-concept, self-efficacy;
- (ii) Achievement task values: importance, interest, usefulness;
- (iii) Goals: mastery, performance, avoidance;
- (iv) Learning strategies: elaboration, rehearsal, control, effort/persistence, cooperation, competitive;
- (v) Subjective theories about ability, causal attributions for academic results.

These constructs and items were mainly taken and adapted from Eccles and Wigfield (2002) and the Organisation for Economic Co-operation and Development (2001) PISA study.

Standardized Test and School Examination Results

Students' standardized achievement test and school examination/test results in Chinese, English and Mathematics were collected. As examinations of different schools were graded with different standards, the examination scores in each school were adjusted using the common standardized test performance of that school. Thus, each student would have two sets of achievement scores which were comparable across all students in the study. The standardized test score was based on an identical test taken by all students in the study. The school examination score was the student's relative score in the school examinations put on a common scale across all schools.

Results and Discussion

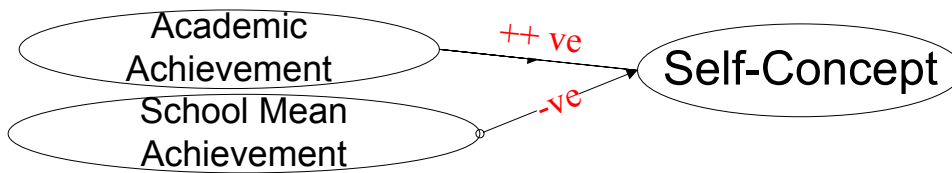
We started with the examination of the BFLPE. In accordance with previous BFLPE analyses (e.g., Marsh & Hau, 2003), this is examined by a regression analyses in which the school mean achievement is used simultaneously with individual achievement in predicting self-concept (see Table 1, column 2 under Chinese, English and Mathematics respectively). Separate analyses were conducted for the three main subjects, Chinese, English and Mathematics, respectively. For example, for Chinese (see row 1 in Table 1), individual students' Chinese achievement (column 1), mean school achievement in Chinese (i.e., the BFLPE) and the interaction between mastery goal \times mean school achievement (i.e., interaction between mastery goal and BFLPE) were used to predict students' Chinese self-concept.

Table 1 Moderator of Big-Fish-Little-Pond Effects (standardized beta)

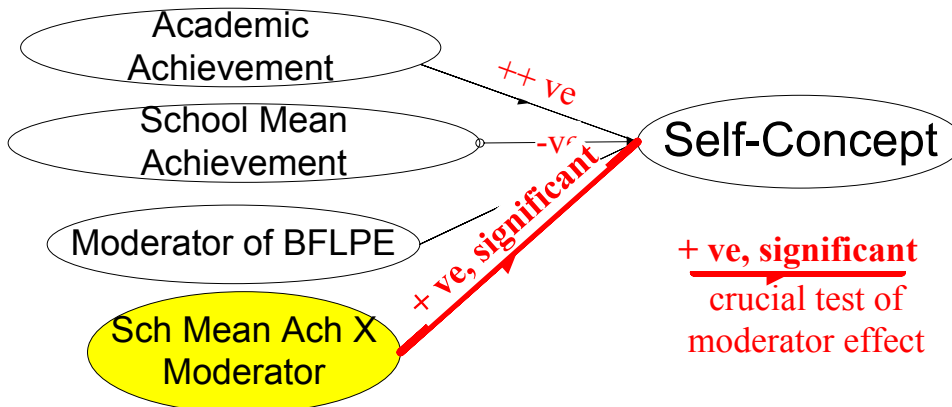
Moderator	Chinese			English			Maths		
	Ach	Mean Sch Ach BFLPE	Moderator effect on BFLPE	Ach	Mean Sch Ach BFLPE	Moderator effect on BFLPE	Ach	Mean Sch Ach BFLPE	Moderator effect on BFLPE
Mastery Goal	.136	-.180	.124	.619	-.556	.247	.438	-.535	.390
Performance Goal	.136	-.119	-.040	.619	-.521	.089	.439	-.412	.146
Avoidance Goal	.136	-.172	-.087	.619	-.512	-.120	.438	-.428	-1.087
Cooperative strategies	.136	-.091	-.223	.620	-.457	-.108	.438	-.383	.007
Competitive strategies	.135	-.135	-.171	.619	-.535	.069	.438	-.410	.245
Persistence strategy	.136	-.229	-.044	.619	-.629	.178	.439	-.583	.186
Ability attribution	.137	-.139	.314	.620	-.492	.085	.439	-.313	-.551
Utility (value)	.136	-.107	-.062	.620	-.509	.161	.439	-.397	.346
Interest (value)	.095	-.025	-.199	.618	-.547	-.021	.439	-.449	.071
Importance (value)	.136	-.100	-.023	.620	-.464	.087	.439	-.413	.161

Figure 1 Reducing/Moderating the negative Big-Fish-Little-Pond Effects

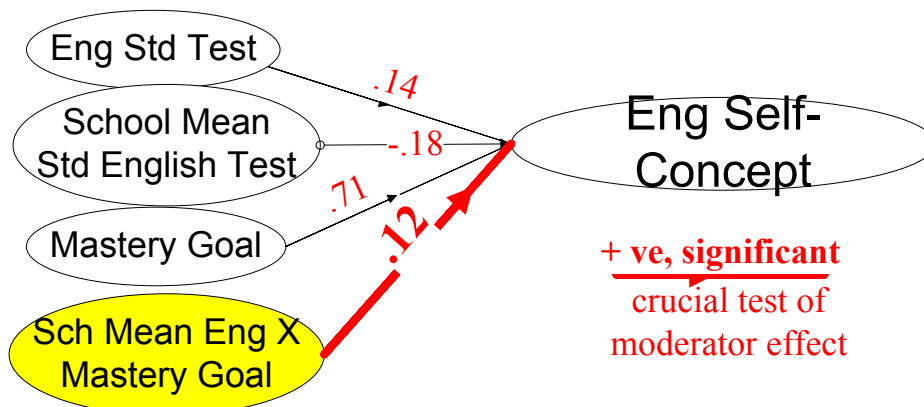
BFLPE



Moderator of BFLPE



Moderator of BFLPE



In the above regression, the last term (interaction between mastery goal and BFLPE) represents the potential moderation effect of mastery goal on BFLPE. As shown in Figure 1, a potentially useful moderator to reduce the negative BFLPE was indicated mathematically by a significant interaction term between the particular beneficial moderation (e.g., mastery goal) and school mean achievement. A positive and significant path of this interaction term would support the usefulness of this moderator in reducing the negative BFLPE.

A perusal of all the BFLPE effects (second column under Chinese, English, Mathematics in Table 1) shows that all BFLPE were negative, which reaffirms the universality of BFLPE among these Chinese students. The most important and interesting objective of the present research is to examine the potential moderation of BFLPE. Specifically a positive effect implies that the BFLPE can be reduced by the respective individual difference attribute (e.g., mastery goal), while negative effects actually increase the BFLPE. An inspection of the moderator effects in Table 1 shows that in general stronger mastery goal, persistence strategies, and utility (value) help to reduce the negative BFLPE, while stronger avoidance goal and ability attribution (for Mathematics) further increase this negative BFLPE.

The results are consistent with the general belief about achievement goals that mastery goals, persistence, and value are desirable traits to cultivate. With mastery goals, for example, students are more concerned with their own improvement and learning than with comparison with their peers. Understandably, students with stronger performance rather than mastery goals pay constant attention to classmates' performance and make social comparison a more salient process. This subsequently leads to a stronger BFLPE. Thus, it is particularly important for prestigious and competitive elite schools in which BFLPE is obviously affecting a lot of the high-achieving students to adopt and emphasize a school culture where learning and mastery, rather than competition and outperforming others, are important.

While there is consistent support for the mastery goal that can reduce BFLPE in all academic subjects, the effects of other individual difference attributes are not as consistent as that. Future research can further investigate why and how these attributes may have differential effects on different academic subjects.

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