Big Fish Little Pond Effects on Academic Self-concept: Counterbalancing Contrast and Reflected Glory Effects in Hong Kong High Schools

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30 May, 1999

This paper is part of a symposium sponsored by the SELF Research Centre at the 1999 joint meeting of the Australian and New Zealand Associations of Research in Education (Melbourne, 29 Nov - 2 Dec, 1999) and the basis of discussion by the Discussion Group of the SELF Research Center that is available through its Home Page (http://edweb.macarthur.uws.edu.au/self/ ). This longitudinal study is part of an ongoing educational policy research project that was initiated by the Educational Research Section of the Hong Kong Education Department. The achievement data have been graciously provided to the authors for purposes of the present investigation, in part during visits by the first author to the Faculty of Education at The Chinese University of Hong Kong that were partially funded by the Chinese University of Hong Kong. The research was also supported through a Special Investigator Grant to the first author from the Australian Research Council. We thank Alexander Yeung, Ray Debus, Olaf Koeller, John Hattie, Rhonda Craven and Kate Johnson for helpful comments on earlier versions of this paper. Correspondence in relation to this study should be sent to Professor Herbert W. Marsh, Faculty of Education, University of Western Sydney, Macarthur, PO Box 555, Campbelltown, NSW 2560 Australia (h.marsh@uws.edu.au) or to Professor Kit-Tai HAU, Faculty of Education, The Chinese University of Hong Kong, Shatin, N.T., Hong Kong (kthau@cuhk.edu.hk).

Abstract

We evaluated the effects of school-average achievement and perceived school status on academic self-concept in Hong Kong (7,997 students, 44 high schools, 4 years), a collectivist culture with one of the most achievement-segregated high school systems in the world. Consistent with a priori predictions based on the big-fish-little-pond effect (BFLPE), being in schools where higher school-average achievements is high led to initially lower academic self-concepts and further declines over time (contrast effects) whereas higher perceived school status had a counter-balancing positive effect on self-concept (reflected glory, assimilation effects). Prior self-concept also had a positive effect on subsequent achievement even after controlling for prior achievement. The negative BFLPE is the net effect of counterbalancing influences, stronger negative contrast effects and weaker positive assimilation effects, so that controlling perceived school status led to purer - and even more negative - contrast effects. This study more clearly identifies the simultaneous operation of assimilation and contrast effects than previous BFLPE studies or, perhaps, any research based on the imposed social comparison paradigm. In summary, attending a school where school-average achievement is high simultaneously results in a more demanding basis of comparison for one's students within the school to compare their own accomplishments (leading to the stronger a negative contrast effect) and a source of pride for students within the school (leading to ane weaker positive assimilation effect).
Longitudinal Multilevel Modeling of the Big Fish Little Pond Effect on Academic Self-concept: Counterbalancing Social Comparison and Reflected Glory Effects in Hong Kong High Schools

Social comparison processes lead students attending academically selective schools to experience lower academic self-concepts than equally able students attending less academically selective schools, a negative big-fish-little-pond effect (BFLPE). In the typical demonstration of this effect (see e.g., Marsh, 1987; 1993), school-average achievement is negatively related to academic self-concept after controlling the effects of individual student achievement. (Because the BFLPE is typically negative, it should, perhaps, be called the "little fish in a big pond" effect, but we retain the traditional BFLPE label.) According to this theoretical position, equally able students who attend schools in which school-average achievement differs will use correspondingly different frames of reference in evaluating their own academic accomplishments, and this process will affect academic self-concept and subsequent academic outcomes.

The historical, theoretical underpinnings of this research come from research in psychophysical and social judgment, social psychology, sociology, social comparison theory, and the theory of relative deprivation. Coming from a psychometric tradition, the term contrast is used when the judgment of a target stimulus shifts away from the background or context, whereas the term assimilation is used when the judgment shifts toward the context. In the BFLPE, contrast occurs when higher school-average achievement levels (the context) lead to lower individual student academic self-concepts (target judgment), whereas assimilation occurs when higher school-average achievement leads to higher academic self-concepts (Marsh, 1984). For present purposes, we treat the BFLPE as a generic social-comparison process that can result in either (or both) contrast (negative social comparison) or assimilation (positive social comparison, reflected glory) effects.

Whereas previous BFLPE research has focused on negative contrast or contrast effects research, the BFLPE is hypothesized to be the net effect of two counterbalancing processes: (1) negative contrast effects that have been emphasized and, (2) positive, reflected-glory, assimilation effects. Because the BFLPE is consistently negative, the negative contrast effect is apparently much stronger than the positive assimilation effect. Although there is a clear theoretical basis for reflected-glory assimilation effects have a clear theoretical basis, these effects have been implicit and have not been adequately operationalized in BFLPE studies. Hence, a major focus of the present investigation is to simultaneously identify both the contrast (contrast) and assimilation (reflected glory) assimilation effects posited to underlie the BFLPE.

Big Fish Little Pond Effect

Domain Specificity of the BFLPE

The BFLPE is very specific to academic self-concept. This supports Consistent with the clearly established multidimensionality of self-concept and the need to distinguish between academic and non-academic components of self-concept (Byrne, 1996; Marsh, 199388; Marsh & Hattie, 1996). Marsh (199387) showed that there were large negative BFLPEs for academic self-concept, but little or no systematic effects on nonacademic components of self-concept, general self-concept, or self-esteem.

The size of the BFLPE should also vary with the size of contextual differences (i.e., if the distribution of abilities is the same in all schools there should be no BFLPE). Marsh, Chessor, Craven, and Roche (1995) reported Hence, whereas Marsh and Parker (1984)
reported a contrast effect of -.36 based on schools specifically chosen to be extreme in terms of school-average ability, more modest contrast effects of -.23 (Marsh, 1987) and -.21 (Marsh, 1991) were found in nationally representative samples. Marsh (1990b) simultaneously evaluated school-average abilities in mathematics and English. He found that school-average math achievement had a negative effect on math self-concept but not verbal self-concept, whereas school-average English achievement had a negative effect on verbal self-concept but not math self-concept.

The BFLPE is central to a wide range of educational outcomes. Is the lowered academic self-concept associated with attending an academically selective high school necessarily bad and what are the effects on a broader selection of academic outcomes? In a very large, nationally representative sample of US students (based on the high school and beyond data), Marsh (1991) greatly expanded the number range of outcome variables to include: academic and general self-concept, selection of advanced coursework selection, academic effort, educational and occupational aspirations, school grades, performance on standardized achievement test scores collected in the sophomore year and again in the senior years of high school; and college attendance, educational aspirations, and occupational aspirations measured two years after high school graduation. The effects of attending higher-ability high schools were negative for almost all 23 outcomes and were not significantly positive for any of the outcomes. Much of the negative effects of school-average ability on this extensive set of outcome variables were mediated by academic self-concept and educational aspirations., thus expanding the implications of the BFLPE.

The Juxtaposition of BFLPE Contrast and Assimilation (Reflected Glory) Effects

If students compare their own accomplishments with those of classmates use the other students in their academically selective schools, then their academic self-concept should decline as a basis of comparison, then participation in academically selective schools should result in lowered academic self-concepts consistent with the ; a negative BFLPE or -- contrast effect (e.g., there are a lot of students better than I am so I must not be as good as I thought). Alternatively, affect, identification, self-perceptions, and self-concept may be enhanced by membership in groups that are positively valued by an individual through the reflected glory of accomplishments or good qualities of other group members that should result in a positive BFLPE. There is ample evidence that people enjoy basking in the reflected glory of successful others by merely associating with distinguished individuals or joining highly valued social groups. Thus, it would be reasonable for students in academically selective schools mightto have more positive academic self-concepts by virtue of being chosen to be in a highly selective educational program -- an assimilation, reflected glory, identification, or labeling effect (e.g., if I am good enough to be in this selective school ed to be in this prestigious program with all these other very smart students, then I must be very smart).

Many social comparison studies emphasize how Social comparison research suggests that people Buunk and Ybema (1997) proposed similar processes to those considered here in their identification-contrast model which "assumes that individuals compete for status and prestige and have a strong desire to identify upward and contrast downward in order to maintain a perception of themselves as doing better than others on dimensions they consider important." (p. 380) prefer upward comparisons that facilitate identification and being like the comparison targets, but not when forced to contrast their own poorer attributes with the better attributes of upward comparison targets. Downward comparisons are preferable when they facilitate contrast of one's own attributes with those of others who have poorer attributes, but not when the comparison leads to identification with or perceiving oneself (or being perceived by others) as being similar to the downward comparison target. Although such coping and impression management strategies are relevant, our focus is
more on social comparison processes associated with how well-established group
membership (the school one attends) affects self-concept rather than how individuals
chose, manipulate, or construct their comparison targets. Diener and Fujita's (1997) refer to
this as situationally imposed comparisons or forced comparisons with people who are
already in a context that is situationally imposed as opposed to a more flexible situation in
which individuals have considerable freedom to consciously select or construct a
comparison target so as to maximize various goals. They suggested that there is limited support for social comparison theory in this forced comparison setting, going so far as to pose the provocative question: "Do imposed social comparisons ever matter?" (p. 350). In contrast to much of the research that they review, there is clear support for the
effects of situationally imposed comparisons in BFLPE studies reviewed here. Indeed, this
setting is probably the ideal setting to study forced comparisons because there are so many
inherent constraints and a natural emphasis on social comparison of achievement levels in a
school setting. Consistent with this perspective, Diener and Fujita, but emphasized that
school closely approximates a "total environment" (where the frame of reference affecting
judgment is limited to the immediate context) implicit in the forced comparison and cited this
BFLPE research as one of the few well-validated examples showing that imposed
comparisons do have a substantial, lasting impact.

Marsh (1984, 1987, 1993; Marsh, Chessor, et al., 1995) argued that both the counter-
balancing negative contrast effects and positive assimilation effects processes are likely to
affect self-concept so that the typically observed BFLPE is actually the net effect of these
negative social comparison effects and positive reflected glory effects (Marsh, 1984, 1993).
Thus, an assimilation effect may be operating even though its effect is overshadowed and
masked by (contrast) effects, but little research has attempted to disentangle the two effects
in BFLPE studies. Furthermore, controlling for the positive assimilation effects by including
relevant variables in the model should result in purer, more negative contrast effects and, perh
perhaps, controlling for the contrast effects should lead to more positive reflected glory
effects.

Consistent with these theoretical perspectives, we define the BFLPE to be the net effect of
the negative social comparison contrast effects that have been emphasized in previous
BFLPE studies and the positive reflected glory assimilation effects that have remained
largely implicit in previous BFLPE research. This focus on the BFLPE as the net effect of two
processes makes it clear that an important limitation of previous BFLPE research has been
the failure to operationalize the reflected glory assimilation effect that has remained implicit
and to systematically explore the juxtaposition of these two processes.

Our Investigation: The Juxtaposition of
BFLPE and Reflected Glory Effects in Hong Kong

In our four-year longitudinal study, we evaluate the BFLPE and the juxtaposition between
assimilation and contrast effects for a large cohort of high schools in Hong Kong. On the one
hand, this is the most highly achievement segregated high school system in the world, which
might be expected to lead to more negative contrast effects (i.e., the contextual differences
are larger). On the other hand, because the Chinese culture Hong Kong was a British colony
but became a special administrative region of the People's Republic of China on July 1,
1997. During both periods Chinese culture and values have been strongly felt and
emphasized in Hong Kong. For example, study of cultural values showed is low on to be low
on individualism and a similar study (Chinese Culture Connection, 1987) showed Hong Kong
to be high on collectivism, it should be less susceptible to the negative contrast effects due
to social comparison processes and should have a greater tendency to value their social
group than those in individualistic settings. Consistent with this perspective, face -- one's
reputation -- is of great concern in the Chinese culture and admission to a prestigious high school is highly valued in Hong Kong. Hence, the gain in status and face for oneself and one's family due to attending a prestigious high school (reflected glory, assimilation) may possibly overshadow the loss in academic self-concept due to negative contrast resulting from comparisons with high achieving classmates. Also consistent with this potential deemphasis of social comparison processes, Hong Kong students attribute their examination results more to effort than to ability and concentrate more on their own improvement over time than on comparison with other students as determinants of perceived academic achievement. If Chinese students do value being members of a high average achievement school (stronger assimilation effects) and their collective orientation reduces attention to social comparison processes (weaker contrast effects), the net BFLPE may be substantially less negative or close to zero.

Our Consistent with this perspective, face -- one's reputation -- is of great concern in the Chinese culture (e.g., Ho, 1976). Admission to a prestigious high school is highly valued in Hong Kong. Hence, the gain in status and face for oneself and one's family in attending a prestigious high school (assimilation) may possibly overshadow the loss in academic self-concept due to social comparisons with high achieving classmates. Also consistent with this potential deemphasis of social comparison processes, Hau and Salili (1991, 1996) found that Hong Kong students attribute their examination results more to effort than to ability and that they concentrate more on own improvement over time than on comparison with other students as determinants of perceived academic achievement. investigation also incorporates several advantages over most previous BFLPE research in that it: specifically includes a new measure of perceived school status to infer reflected glory; uses particularly good measures of pretest achievement collected prior to the start of high school that are not confounded with true school effects; and employs multilevel modeling that more appropriately disentangles effects due to individual students and schools than inappropriate multiple regression analyses used in most previous research.

In summary, Hong Kong is a an ideal setting in which to test the generalizability of the BFLPE that is based primarily on Western research and the new emphasis on particularly interesting setting to evaluate the BFLPE and the juxtaposition between assimilation and contrast effects. Because Hong Kong ; it is one of the most highly achievement segregated high school systems in the world, the negative contrast effects might be stronger. On the other hand, cultural differences may weaken the social comparison processes and strengthen the reflected glory processes. should undermine the negative contrast effects and reinforce the positive reflected glory assimilation effects. These differences -- along with the methodological advances incorporated into this study - have important theoretical and practical implications for BFLPE studies and their integration with the larger body of social comparison research.

In addition to the importance of the Hong Kong setting, the present investigation has several other features that provide important extensions to most previous research in this area. Analyses in the present investigation are based on multilevel models that more appropriately incorporate variables representing different units of analysis (e.g., individual students and schools). Also, pretest achievement measures that were the basis of selecting and allocating all Hong Kong students to attend different high schools (secondary school places allocation scores) are used to control for prior achievement and to determine school-average achievement levels. Hence, these pretest measures are logically independent of the subsequent effects attributable to the different schools. This is important because many BFLPE studies do not have true pretest measures, relying instead on measures collected after students have begun their new school, thus confounding the effects of prior achievement levels and school effects. Most importantly, the juxtaposition of assimilation and contrast effects is evaluated by a scale specifically designed to measure individual
students’ perceived status of the school they attend in addition to the school-average achievement measures used in most other BFLPE research. Based on theory and previous research reviewed earlier, it is predicted that for academic self-concept the effect of perceived school status is positive (a reflected glory assimilation effect), the effect of school-average achievement is negative (a social comparison contrast effect), and that controlling for perceived school status will result in a more negative contrast effect of school-average achievement than in models excluding school status.

Method

Sample

In Hong Kong, schooling through Grade 9 is compulsory and free. At the end of Grade 6, secondary school places for YearGrade 7 are allocated according to parental choice in the order of merit of students’ internal school examination results moderated by public examination performance. This placement score is then placed into five broad bands of equal size (20% of the students per band). Students in the higher achievement bands are allocated by their parental choice, but students within the same band applying to the same school are allocated randomly, so that even the most selective schools will have an achievement mix of students within the top 20% of all students. In addition, a small number of primary and secondary schools are linked so that some secondary school places are reserved for the linked primary schools if these students can meet minimum placement score standards. Within these constraints, students are largely free to choose any high school in Hong Kong. Schools select students largely on the basis of merit, their school and schools attracting better students are those with better examination results, higher university admission rates, a history of positive results, and a good reputation among parents as well as other desirable characteristics (e.g., proximity to home). Our study is part of a large-scale investigation on different types of secondary schools in Hong Kong. The sample (7,997 students from 44 high schools) is broadly representative of Hong Kong schools.

Procedures and Measures

Measures were pretest (T0Ach) achievement, scores from standardized achievement tests administered at T1, T2, and T3 (T1Ach, T2Ach, T3Ach), academic self-concept responses collected at T2 and T3 (T2ASC, T3ASC), and a measure of perceived school status (Pstat). At T1, T2, and T3, students completed achievement tests according to a modified random matrix sampling design. In the first 40-minute session, each student was randomly assigned an achievement test in one of three core subjects (: Chinese, English, and mathematics) in the first testing session and . Thus, for example, the likelihood of a student completing a math exam in any one year was 1/3 and the likelihood of any one student completing a math exam in all three years was 1/27 = 1/3 x 1/3 x 1/3. In the second test session, students were randomly assigned to take a test in one of three additional subjects (: geography, history, and science) in the second session. A total achievement test was obtained for each student in each year of the study by taking the mean of the tests completed by each student in each of the three years (T1Ach, T2Ach, and T3Ach) of the study. The survey instrument administered was administered during an additional testing session conducted separately by each school at the end of the study in each of the three years (T1Ach, T2Ach, and T3Ach) of the study. The survey materials included a Chinese translation of the SDQ-II, but for purposes of our investigation, only responses to the academic self-concept scale from the SDQ-II are considered. The survey materials also contained a four-
item School Status scale (e.g., "My school has a good reputation", "The academic standard of my school is high, many students want to get in").

**Statistical Analysis**

A detailed presentation of the conduct of multilevel modeling (also referred to as hierarchical linear modeling) is available elsewhere (e.g., Bryk & Raudenbush, 1992; Goldstein, 1987, 19952, Kenny, 1996; Raudenbush & Bryk, 1988). Particularly in social, organizational, and educational research, characteristics associated with individuals who are clustered within groups (e.g., students in schools) pose special problems related to appropriate levels of analysis, aggregation bias, heterogeneity of regression, and associated problems of model misspecification due to lack of independence between measurements at different levels. It is generally inappropriate to pool responses of individuals without regard to groups. Furthermore, unless it can be shown that groups do not differ significantly from each other (see Pedhazur & Schmelkin, 1991). Moreover, relations observed at one level may not bear any straightforward connection to relations observed at another level (e.g., the positive effects of individual achievement and negative effects of school-average achievement on academic self-concept being a particularly dramatic example).

Models considered here are two-level models in which level-1 is the student level and level-2 is the school level. To illustrate, consider a simple level 1 model relating the dependent variable (Y) which, in this case, is T3 academic self-concept (T3ASC) to pretest achievement (T0Ach) with an intercept (B0), a slope (B1), and a residual variance (R).

\[(1) \text{T3ASC} = B0 + B1*(T0Ach) + R [\text{Level-1 model}]\]

Unlike the typical regression model, the slope and intercept are allowed to vary from school to school rather than being the same across all schools. In the (school) level-2 model there are separate regression equations for the intercept and the slope terms that can also include school-level variables such as school-average pretest achievement (S_Ach). Thus, the intercept for each school (B0 from equation 1 that is modeled in equation 2) is a function of a grand mean of intercepts across all schools (G00), a slope representing the effect of S_Ach (G01), and a residual term (U0) that is specific to the particular school.

\[(2) B0 = G00 + G01*(S_Ach) + U0 [\text{Level-2 model}]\]

Similarly, the slope for each school (B1 from equation 1 that is modeled in equation 3) is a function of a grand mean of slopes across all schools (G10), an effect of S_Ach (G11) on the slope, and a residual term (U1) for each school. G11, the extent to which the effect of T0Ach on T3ASC varies as a function of S_Ach, is an interaction term.

\[(3) B1 = G10 + G11*(S_Ach) + U1 [\text{Level-2 model}]\]

This approach is quite flexible in that other (student) level-1 predictors can be added to equation 1 such as T1 achievement (T1Ach), T2Ach, T3Ach, T2 academic self-concept (T2ASC), and perceived school status (PStat). For each additional level 1 variable it is possible to model the effect (e.g., additional slope terms B2, B3, etc.) as a function of a grand mean slope across all schools (G20, G30, etc.), the extent to which this effect varies with school-average achievement (G21, G31, etc.) and a residual term for each school (U2, U3, etc.). Although school-average achievement is the only (school) level-2 explanatory variable considered in this study, it would be possible to include other school-level variables. In the multilevel modeling approach, there are fixed effects (e.g., G00, G01, G10, G11) and random effects (R, U0, U1). For each fixed effect there is a parameter estimate and a standard error that is used to assess its statistical significance. For each residual effect there
is a residual variance term indicating how much residual variance there is in the prediction of the student level variable (variance of R) or for the level 2 residuals (e.g., U0, U1, etc.)

Results

Preliminary Analyses

Prior to presentation of the multilevel analyses, some preliminary results may explicate the BFLPE. Academic self-concept is positively correlated with achievement; pretest achievement (from Grade 6, prior to the start of high school) is positively correlated with academic self-concept at Grade 8 (.23) and Grade 9 (.25), whereas Grade 9 achievement is correlated more highly with Grade 9 academic self-concept (.37). Students who attend schools with higher school-average pretest achievement have slightly higher academic self-concepts than do students who attend schools with lower school-average achievement. These small differences, however, are substantially smaller than would be expected based on differences in pretest achievement levels of students in these schools. For example, when both individual and school-average (pretest) achievement are regressed on academic self-concept, the effect of individual achievement is positive (b = .34 for Grade 8, .39 for Grade 9) whereas the effect of school-average achievement is negative (b = -.20 for Grade 8, -.22 for Grade 9). Although comparisons of beta-weights from different studies should be made cautiously, the sizes of these negative effects are comparable to those found in nationally representative samples of US students (e.g., -.21, Marsh, 1987; -.23, Marsh, 1991).

We now turn to the multilevel results (Tables 2-5) that are presented as a series of multilevel regression analyses in which different predictor variables are related to different outcome variables. The main findings are the juxtaposition of the negative (contrast) effects of school-average ability on academic self-concept and the positive (assimilation, reflected glory) effects of school status on academic self-concept. Also of interest are how these effects are related to academic achievement.

Negative Effects of School-average Ability Effects on Academic Self-concept

The negative contrast effect is reflected in the negative effect of school average pretest achievement (S_Ach) on academic self-concept after controlling at least individual pretest achievement (T0Ach). In the first set of models (Models 1 - 3, see Table 1 & Figure 1), the negative effect of school-average achievement on T2 academic self-concept varies from -.22 (when only T0Ach is controlled) to -.24 (when T0Ach, T1Ach, and T2Ach are controlled). This replicates the negative (contrast) effect found in many other BFLPE studies.

Because academic self-concept was measured on two occasions, it is possible to evaluate the additional negative effects of school-average achievement at T3 beyond the negative effects at T2 (Models 7 - 9, Table 1). These are models of self-concept change because the effects of T2 self-concept are partialled out of T3 self-concept. Not surprisingly, the largest effect on T3 self-concept in each of these models is T2 academic self-concept, although academic achievement continues to have a positive effect. Of critical importance, the negative (contrast) effect of school-average achievement on T3 academic self-concept is still significantly negative even after controlling for the negative effect of school-average achievement mediated by T2 self-concept. Hence, there are new, additional negative effects of school-average achievement on T3 academic self-concept beyond the negative effects at T2.

In summary, Models 1- 9 provide clear support for the negative BFLPE in Hong Kong high schools. Not only are there negative BFLPEs for T2 and T3 academic self-concept
considered separately, but the negative BFLPEs for T3 academic self-concept are larger than those that can be explained by the negative BFLPE already experienced at T2.

**School-average Ability Effects on Academic Achievement**

In Models 10 - 15 (Table 2), T1, T2 and T3 achievement scores are related to pretest achievement (T0Ach) and school-average pretest achievement (S_Ach). Not surprisingly, the largest effects are those of prior achievement. None of the effects of school-average achievement on subsequent achievement is significant. Growth in achievement is not much affected by school-average achievement.

**Positive Effects of Academic Self-concept Effects on Subsequent Academic Achievement**

In Models 16-21 (Table 3), academic self-concept is added to models predicting T2 and T3 achievement. The effects of self-concept on achievement are positive even after controlling for measures of prior achievement. These results contribute to the growing body of research based on longitudinal path models, showing that self-concept has a "causal" effect on achievement (although models in Table 1 also indicate that prior achievement affects subsequent self-concept, indicating that the relations are reciprocal).

**Perceived School Status**

In models 22-27 (Table 4), perceived school status is modeled as a function of prior achievement, academic self-concept, and school-average achievement. For each model, there is a very large, positive effect of school-average achievement (.56 to .60). Perceived status is substantially a function of the ability levels of students attending the school. There is also a consistently positive effect of academic self-concept. Students who have higher academic self-concepts perceive the status of their school to be higher (although subsequent models show that status has a positive effect on subsequent academic self-concept, so that the effect is reciprocal).

Interestingly, individual student achievement has a negative effect on perceived school status; better students perceive the status of their school to be lower than do poorer students. Furthermore, this negative effect, however, varies somewhat depending on the school-average achievement. The the negative effect of student achievement on school status is more negative when school-average achievement is low. Although not predicted a priori, this pattern of results is logical and consistent with our interpretation of reflected glory effects. Very high performing students perform better than most of the other students in their school - particularly if school-average achievement is low - so they do not experience as much "reflected glory" as do students not doing as well who can look up to the best students. Consistent with Buunk and Ybema's (1997) identification-contrast model, when students perceive themselves as being more able than their classmates there is little benefit in identifying with them. A more effective strategy, at least in terms of maximizing academic self-concept, is to contrast their relatively superior skills with the weaker skills of their classmates. However, when students perceive their academic skills to be weaker than those of their classmates, then it is a more effective strategy to identify with the high perceived status of the school rather than to contrast their poorer skills with the superior skills of their classmates.
Juxtaposition of Social Comparison Contrast and Reflected Glory Assimilation Effects

The effects of students' perceived status of their school are added to models of T3 academic self-concept (Models 28-31, Table 5). The critical features of these models is the juxtaposition of the effects of school-average pretest achievement (S_Ach), perceived status, and these effects of school-average achievement with those in corresponding models already considered (in Tables 1 and 3) that do not include school status.

The effect of perceived school status on T3 academic self-concept is positive (.17 in both Models 28 and 29, Table 5; also see Fig 1) and continues to be positive even after controlling for T2 self-concept. In marked contrast, the effects of school-average achievement on T3 academic self-concept are substantially negative (-.33 and -.31). These negative effects of school-average achievement are substantially more negative than in corresponding models that did not include school status. Thus, for example, Model 5 (Table 1) and Model 28 (Table 5) differ only in the inclusion of school status, but the negative effect of school-average achievement is -.33 in Model 28 that included school status but is only -.23 in Model 4 that excludes school status. Similarly, the negative effect of school-average achievement is -.31 in Model 29 that included school status but is only -.21 in Model 5 that excludes school status. The negative effect of school-average ability is more negative when school status is controlled.

In summary, the juxtaposition of the positive reflected glory assimilation effects of school status and the negative contrast effects of school-average achievement support a priori predictions. Furthermore, also consistent with a priori predictions, the inclusion of school status into models of academic self-concept resulted in the negative effects of school-average achievement becoming more negative. These suppression effects are consistent with theoretical predictions that the BFLPE is a net effect of the positive assimilation and negative contrast effects. Hence, when the positive assimilation effects are controlled by the inclusion of school status, the negative effect of school-average achievement becomes a more pure measure of the negative contrast effects and school-average achievement effects become more negative.

Discussion

Hong Kong is an ideal setting for testing the generalizability of the BFLPE and extending this research to more fully evaluate the juxtaposition between negative contrast and positive assimilation effects. The contextual differences are larger - because it is one of the most highly achievement segregated Because of the secondary school systems in the world - and so the contrast effects should be more negative than in most Western settings. Also, because assignments to schools are based in part on random allocation of students within broad achievement bands who apply to a particular school, initial achievement differences are less likely to be confounded with other influences than in most school systems where allocation is more heavily influenced by other factors. On the other hand, due to collectivist values in this Chinese setting and the value placed on attending a prestigious high school the typical social comparison processes underlying the negative BFLPE should be weaker, whereas the reflected glory processes may be stronger. Apparently reflecting these counter-balancing predictions, the size of the negative contrast effects in this study appear roughly comparable to those found in nationally representative US samples (e.g., Marsh, 1987; 1991).

Based on our hypothesis, as we predicted, the inclusion of perceived school status into the BFLPE model would resulted in a positive effect of school status on academic self-concept (the reflected-glory assimilation effect) and an even more negative effect of school-average
achievement on academic self-concept (the social comparison contrast effect). More specifically: . The results provided clear support for the predictions in that: (a) there was a strong negative contrast effect of school-average achievement on academic self-concept when both individual and school-average pretest achievement (but not perceived school status) were included in the model; (b) the negative effect of school-average achievement became more negative when school status was included in the model whereas the effect of school status was positive; and (c) even in models of self-concept change there was evidence of new, additional contrast effects on T3 self-concept beyond the substantial negative effects on T2 self-concept and these additional negative effects also became more negative by with the inclusion of perceived school status. The results imply that attending a school where school-average achievement is high -- particularly in Hong Kong -- simultaneously results in a more demanding basis of comparison for students within the school to compare their own accomplishments (the basis of the negative contrast effects) and a source of pride for students within the school (the basis of the positive reflected glory, assimilation effects). By including a separate measure of perceived school status, we partialled out some of the reflected glory effects associated with school-average achievement so that it became a better (less confounded) basis for inferring social comparison contrast effects, leading to a more negative BFLPE. These results also imply that previous research may have underestimated the size of the negative contrast effects. However, because reflected glory effects were predicted to be particularly important in Hong Kong, further research is needed to determine the generality of counter-balancing assimilation and contrast effects.

In summary, as emphasized by Diener and Fujita (1997) and consistent with the growing body of BFLPE research, the results of the present investigation demonstrate that imposed social comparisons do matter. Even in a collectivist cultural setting hypothesized to minimize negative social comparison contrast effects, there is strong support for a negative BFLPE. More clearly than any previous BFLPE research and, perhaps, any other studies using the imposed social comparison paradigm, the our results of the present investigation unmistakably differentiated between negative social comparison contrast effects and positive reflected glory assimilation effects that comprise the BFLPE. Whereas this finding is certainly consistent with theoretical predictions and is implicit in previous explanations of the BFLPE, previous research has not operationalized the reflected glory effect. In particular, consistent with a priori predictions, the effect of school-average ability on academic self-concept was negative prior to controlling for perceived school status and was even more negative after controlling for perceived school status. For example, in high-achieving schools, school-average achievement was primarily a demanding basis of comparison against which students must contrast their own academic accomplishments but also a source of pride with which students could identify. When a direct measure of perceived school status was added to the model - controlling the reflected glory component of school-average achievement - school-average ability became a more pure measure of the negative social comparison processes. A major focus of BFLPE research has been on the substantively important and surprising implications of this research, undermining the assumed advantages of attending academically selective schools. Although obviously supportive of these well-established concerns, the present investigation provides stronger links between BFLPE and broader areas of social comparison theory.
References


**Table 1**

**Models of Academic Self-concept (T2 T3 and Change) As A Function of Individual and School-Average Achievement**

<table>
<thead>
<tr>
<th>T2 Academic Self Concept</th>
<th>T3 Academic Self-concept (not change)</th>
<th>Change in T3 Academic Self-concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Effects Coeff SE Coeff SE Coeff SE Coeff SE Coeff SE Coeff SE Coeff SE Coeff SE Coeff SE Coeff SE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S_Ach G01</td>
<td>-.24** .04 -.23** .04 -.22** .04 -.21** .04 -.20** 039 -.09** .03 -.08** .03 -.07* .03</td>
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</tr>
<tr>
<td>T0Ach G10</td>
<td>.13** .02 .22** .02 .32** .02 .10** .02 .14** .02 .21** 018 .06** .02 .09** .02 .11** .02</td>
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<tr>
<td>T0Ach X S_Ach G11</td>
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</tr>
<tr>
<td>T1Ach G20</td>
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<td></td>
</tr>
<tr>
<td>T1Ach X S_Ach G21</td>
<td>.01 .02 .04 .02 .02 .03 .03 .03 .03 .03 .07** 023 .02 .02 .02 .04* .02</td>
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<tr>
<td>T2Ach G30</td>
<td>.29** .02 .12 .02 .22** .02 .03 .02 .09** .02</td>
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</table>
T2Ach x S_Ach G31 .07** .02 .02 .02 .03 .02
T3Ach G40 .25** .02 .17** .02
T3Ach x S_Ach G41 .05** .03 .04 .03
T2ASC G50 .38** .01 .39** .01 .40** .02
T3Ach x S_Ach G51 .10** .02 .11** .02 .11** .02
level-1 Residual .77 .80 .82 .67 .70 .72 .54 .56 .56

Note. T0, T1, T2, and T3 are pretest, and years 1, 2 and 3 of the four-year study. Ach = achievement. S_Ach = pretest school-average achievement, ASC = academic self-concept. Following standard notation (see appendix): fixed effects are labeled with a G followed by two numbers; the first number refers to the independent variable and the second number is either a 0 (an effect on an intercept term) or 1 (an effect on a slope term). Random effects are excluded to save space, but the residual variance at the student level (level 1) is presented.

Table 2
Models of Achievement (T1 T2 T3) As A Function of Prior Achievement and School-Average Achievement

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Coeff</th>
<th>SE</th>
<th>Coeff</th>
<th>SE</th>
<th>Coeff</th>
<th>SE</th>
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<th>SE</th>
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<td>.08</td>
<td>.01</td>
<td>.04</td>
<td>.04</td>
<td>.07</td>
<td>.10</td>
<td>.05</td>
<td>.10</td>
<td>.06</td>
</tr>
<tr>
<td>T0Ach G10</td>
<td>.61**</td>
<td>.02</td>
<td>.31**</td>
<td>.02</td>
<td>.59**</td>
<td>.02</td>
<td>.20**</td>
<td>.02</td>
<td>.30**</td>
<td>.02</td>
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<tr>
<td>T0Ach x S_Ach G11</td>
<td>-.08**</td>
<td>.02</td>
<td>.00</td>
<td>.02</td>
<td>-.03</td>
<td>.02</td>
<td>-.02</td>
<td>.02</td>
<td>-.01</td>
<td>.03</td>
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<tr>
<td>T0Ach, G20</td>
<td>.45**</td>
<td>.02</td>
<td>.18**</td>
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<td>.35**</td>
<td>.02</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>T1Ach x S_Ach G21</td>
<td>.01</td>
<td>.02</td>
<td>-.00</td>
<td>.02</td>
<td>-.00</td>
<td>.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2Ach G30</td>
<td>.36**</td>
<td>.01</td>
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</tr>
<tr>
<td>T2Ach x S_Ach G31</td>
<td>.01</td>
<td>.02</td>
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<td>level-1 Residual</td>
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<td>.36</td>
<td>.66</td>
<td>.31</td>
<td>.36</td>
<td>.41</td>
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</table>
Note. T0, T1, T2, and T3 are pretest, and years 1, 2 and 3 of the four-year study. Ach = achievement. S_Ach = pretest school-average achievement, ASC = academic self-concept. Following standard notation: fixed effects are labeled with a G followed by two numbers; the first number refers to the independent variable and the second number is either a 0 (an effect on an intercept term) or 1 (an effect on a slope term). Random effects are variance components at the school level or residual variance of the individual student level.

Table 3

Models of Achievement (T2 T3) as a Function of Prior Achievement School-Average Achievement and Academic Self-concept

<table>
<thead>
<tr>
<th></th>
<th>Model 16</th>
<th>Model 17</th>
<th>Model 18</th>
<th>Model 19</th>
<th>Model 20</th>
<th>Model 21</th>
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<tbody>
<tr>
<td>S_Ach G0</td>
<td>.04 .05</td>
<td>.08 .07</td>
<td>.12* .05</td>
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<td>T1Ach G1</td>
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<tr>
<td>T1Ach x S_Ach G11</td>
<td>.01 .02</td>
<td>.06* .02</td>
<td>.02 .02</td>
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<td>.02 .03</td>
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<td>T2Ach G3</td>
<td>.30 .34*</td>
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<td>.00 .02</td>
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<td>T3Ach G4</td>
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<td>.09** .01</td>
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<tr>
<td>T3Ach x S_Ach G41</td>
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<td>.01 .01</td>
<td>.01 .01</td>
<td>.02* .01</td>
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<td>.31 .31</td>
<td>.35 .40</td>
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Note. T0, T1, T2, and T3 are pretest, and years 1, 2 and 3 of the four-year study. Ach = achievement. S_Ach = pretest school-average achievement, ASC = academic self-concept. Following standard notation: fixed effects are labeled with a G followed by two numbers; the first number refers to the independent variable and the second number is either a 0 (an effect on an intercept term) or 1 (an effect on a slope term). Random effects are excluded to save space, but the residual variance at the student level (level 1) is presented.

Table 4

Models of Perceived School Status as a Function of: Achievement School-Average Ability and Academic Self-concept
Perceived School Status

Model 22 Model 23 Model 24 Model 25 Model 25 Model 27

Fixed Effects Coeff SE Coeff SE Coeff SE Coeff SE Coeff SE Coeff SE

Intercept G00 -0.08 .05 -0.08 .05 -0.09 .05 -.10* .05 -0.09 .04 -.10* .05
S_Ach G01 .60** .06 .60** .06 .55** .06 .55** .06 .60** .06 .56** .06
T0Ach G10 -.14** .02 -.15** .02 -.12** .02 -.12** .02 -.22** .02 -.17** .02
T0Ach x S_Ach G11 .06** .02 .08** .02 .07** .02 .09** .02 .12** .02 .13** .02
T1Ach G20 -.09** .02 -.11** .02 -.08** .02 -.08** .02 -.22** .02 -.17** .02
T1Ach x S_Ach G21 .02 .02 .05* .02 .02 .02 .06** .02
T2Ach G30 -.05** .02 -.00 .02
T2Ach x S_Ach G31 .06* .02 .07** .02
T2ASC G40 .16** .01 .15** .01 .14** .01
T2ASC x S_Ach G41 .01 .01 .01 .02 .01
level-1 Residual .66 .66 .68 .68 .67 .69

Note. T0, T1, T2, and T3 are pretest, and years 1, 2 and 3 of the four-year study. Ach = achievement. S_Ach = pretest school-average achievement, ASC = academic self-concept. Following standard notation: fixed effects are labeled with a G followed by two numbers; the first number refers to the independent variable and the second number is either 0 (an effect on an intercept term) or 1 (an effect on a slope term). Random effects are excluded to save space, but the residual variance at the student level (level 1) is presented.

Table 5

Models of T3 Academic Self-concept and T3 Achievement as a Function of: Prior Achievement School-Average Ability Prior Academic Self-concept and Perceived School Status

T3 Academic Self-concept T3 Self-concept Change T3 Achievement

Model 28 Model 29 Model 30 Model 31 Model 32 Model 33 Model 34 Model 35

Fixed Effects Coeff SE Coeff SE Coeff SE Coeff SE Coeff SE Coeff SE Coeff SE

S_Ach G01 -.33** .05 -.31** .04 -.14** .03 -.12** .03 .13* .05 .12* .05 .13* .06 .08 .06
T0Ach G10 .12** .02 .16** .02 .07** .02 .10** .02 .18** .02 .19** .02 .28** .02 .30** .02
T1Ach x S_Ach G11 -.06* .02 -.06* .02 -.07** .02 -.06** .02 -.02 .02 -.02 .02 -.02 .02 .01 .03
T1Ach G20 .02 .02 .08** .02 .01 .02 .05** .02 .17** .01 .17** .01 .33** .02 .35** .02
T1Ach x S_Ach G21 .03 .03 .03 .02 .02 .02 .02 .02 .01 .02 .00 .02 .01 .02 .00 .02
T2Ach G30 .12** .02 .22** .02 .03 .02 .10** .02 .33** .01 .34** .01
T2Ach x S_Ach G31 .06* .02 .07** .02 .02 .02 .03 .02 .00 .02 .00 .02
T3Ach G40 .25** .02 .18** .02
T3Ach x S_Ach G41 .04 .03 .03 .03
T2ASC G50 .36** .01 .38** .02 .00 .01 .05** .01 .09** .01
T2ASC x S_Ach G51 .10** .02 .10** .02 -.01 .01 .01 .01 .02 .01
T3ASC G60 .08** .01
T3ASC x S_Ach G61 .03 .01
Status G70 .17** .01 .17** .01 .09** .01 .09** .01 -.02* .01 -.02 .01 -.02* .01 -.00 .01
Status x S_Ach G71 .01 .01 .01 -.02 .01 -.02 .01 -.02 .01 -.02 .01 -.03* .01 .04** .01

level-1 Residual .65 .68 .54 .55 .30 .31 .35 .36

Note. T0, T1, T2, and T3 are pretest, and years 1, 2 and 3 of the four-year study. Ach = achievement. S_Ach = pretest school-average achievement, ASC = academic self-concept, Status = perceived school status. Following standard notation: fixed effects are labeled with a G followed by two numbers; the first number refers to the independent variable and the second number is either a 0 (an effect on an intercept term) or 1 (an effect on a slope term). Random effects are excluded to save space, but the residual variance at the student level (level 1) is presented.
Figure 1. Selected Models of the Big-Fish-Little-Pond Effect. Only significant effects are shown (For more detail see Table 1 (Models 3 and 5) and Table 5 (Model 29)). T0, T1, T2, and T3 are pretest, and years 1, 2 and 3 of the four-year study. Ach = achievement. S_Ach = pretest school-average achievement, ASC = academic self-concept, Status = perceived school status; T0xS_Ach, T1xS_Ach, and T2xS_Ach are interaction effects that test the extent to which the effects of T0, T1, and T2 Achievement vary with school-average achievement.