



**HAL**  
open science

## Clarifying the role of social comparison in the big-fish-little-pond effect (BFLPE): An integrative study

Pascal Huguet, Florence Dumas, Herbert Marsh, Isabelle Regner, Ladd Wheeler, Jerry Suls, Marjorie Seaton, John Nezlek

### ► To cite this version:

Pascal Huguet, Florence Dumas, Herbert Marsh, Isabelle Regner, Ladd Wheeler, et al.. Clarifying the role of social comparison in the big-fish-little-pond effect (BFLPE): An integrative study. *Journal of Personality and Social Psychology*, 2009, 97 (1), pp.156 - 170. 10.1037/a0015558 . hal-01472529

**HAL Id: hal-01472529**

**<https://amu.hal.science/hal-01472529v1>**

Submitted on 31 Dec 2024

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Running head: BFLPE and SOCIAL COMPARISON

Clarifying the Role of Social Comparison in the Big-Fish-Little-Pond Effect (BFLPE):

An Integrative Study

Pascal Huguet and Florence Dumas

Aix-Marseille University & CNRS, France

Herbert Marsh

Oxford University, UK

Isabelle Régner

Aix-Marseille University, University of Toulouse & CNRS, France

Ladd Wheeler

Macquarie University, Australia

Jerry Suls

University of Iowa, USA

Marjorie Seaton

Centre for Educational Research, University of Western Sydney, Australia

John Nezlek

William & Mary College, USA

Key Words: Big-Fish-Little-Pond-Effect, Social Comparison, Academic Self-Concept

Correspondence should be addressed to Pascal Huguet : [pascal.huguet@univ-provence.fr](mailto:pascal.huguet@univ-provence.fr)

## Abstract

It has been speculated that the Big-Fish-Little-Pond Effect or BFLPE (the negative impact of attending highly selective academic settings on academic self-concept) is a consequence of invidious social comparisons experienced in higher ability schools. However, the direct role of such comparisons for the BFLPE has not heretofore been documented. The present study comprises the *first evidence* that the BFLPE 1) is eliminated after controlling for students' invidious comparisons with their class, and 2) coexists with the assimilative and contrastive effects of upward social comparison choices on academic self-concept. These results increase our understanding of the BFLPE and offer support for integrative approaches of social comparison (Selective Accessibility and Interpretation-Comparison models) in a natural setting. They also lend support for the distinction between forced and deliberate social comparisons and the usefulness of distinguishing between absolute and relative comparison-level choice in self-assessment.

## Clarifying the Role of Social Comparison in the Big-Fish-Little-Pond Effect (BFLPE):

## An integrative study

Many educators and parents assume that there are academic benefits associated with attending schools where the average ability level of students is high (as measured by standardized tests). However, considerable evidence indicates that students enrolled in high-ability schools actually fare worse than their counterparts in low-ability schools (Marsh, 1987, 1991, 2005; Marsh & Craven, 2002; Marsh & Hau, 2003; Marsh & Parker, 1984; see also Davis, 1966; Diener & Fujita, 1977). Davis (1966) was the first to demonstrate that a high school graduate at any given level of scholastic aptitude achieved a lower GPA in a highly selective college than in a less selective college which, in turn, was associated with lower self-evaluations and career aspirations. These results suggested to Davis that it is better to be a « big frog in a small pond » than a « small frog in a big pond ». They were taken as support for the theory of relative deprivation (Stouffer, Suchman, DeVinney, Star, & Williams, 1949), because they showed that students evaluated their ability relative to those on the same campus rather than according to criteria recognizing school differences in ability level. However, Davis acknowledged that he had no direct evidence that comparison with other students drove the process.

Going further than Davis (1966), Marsh and colleagues have shown for more than twenty years that *students with the same ability* (as measured by standardized tests) typically have *lower* academic self-concept when they attend *higher*-ability schools than when they attend lower-ability schools, a finding known as the *big-fish-little-pond effect* ('BFLPE' ; Marsh, 1987; for recent reviews, see Marsh, Seaton, Trautwein, Lüdtke,

Hau, O'Mara, & Craven, 2008a; Seaton, 2007). In the typical path model used to test the BFLPE, it is predicted that individual student ability has a positive effect on academic self-concept (e.g., the brighter one is in math, the higher one's self-concept of ability in math), whereas school-average ability has a negative effect (e.g., the brighter one's classmates in math, the lower one's self-concept of ability in math). It is this negative (contrast) effect of school-average ability on students' academic self-concept that characterises the BFLPE. In the largest cross-cultural investigation of the BFLPE to date, Marsh and Hau (2003) examined this phenomenon on nationally representative samples of approximately 4,000 15-year-old students from each of 26 countries ( $N = 103,558$ ). The associations between school-average achievement and academic self-concept were negative in all 26 countries ( $M$  beta =  $-.20$ ,  $SD = .08$ ), and exhibited across all individual student ability levels. The BFLPE is especially problematic, because lowered academic self-concept is associated with negative effects on students' academic choices, academic efforts, and subsequent achievements (e.g., Marsh, 1987, 1990a ; 1991; Marsh & Yeung, 1997).

#### *The BFLPE and Social Comparison*

The BFLPE has been explained from a number of different perspectives (see Marsh & Hau, 2003), but its relation with social comparison theory (Festinger, 1954) has been particularly important in recent research (e.g., Marsh, Trautwein, Ludtke, & Köller, 2008b; Seaton et al., 2008). According to the comparison explanation, a relatively successful student in a classroom with a majority of less academically talented peers should form a high positive academic self-concept because of the abundance of favorable comparisons with less successful students and paucity of more successful students. The same student should compare less favorably in a higher-ability

school where there are more highly talented peers, but few who are more incapable than themselves, leading to lower academic self-concept. This is consistent with research indicating that social comparison is pervasive in schools, particularly in the classroom context (e.g., Altermatt, Pomerantz, Ruble, Frey, & Greulich, 2002 ; Frey & Ruble, 1985 ; Huguet & Kuyper, 2008; Levine, 1983 ; Monteil & Huguet, 1999 ; Pomerantz, Ruble, & Frey, 1995). More to the point, Tracey, Marsh, and Craven (2003), and Marsh, Tracey, and Craven (2006) found that the academic self-concepts of academically disadvantaged students in mixed-ability (regular) classes decreased over time, whereas the academic self-concepts of those in homogeneously lower ability classes increased. Similarly, Reuman (1989) found that within-school (between-class) ability grouping was associated with lower academic self-concepts for high-ability children and higher academic self-concepts for low-ability children.

Thus far, however, there is no direct evidence that the BFLPE is based on comparisons with classmates. The few social comparison studies that have examined students' comparisons with more successful classmates have not found them to be associated with negative educational outcomes (e.g., Blanton, Buunk, Gibbons, & Kuyper, 1999; Huguet, Dumas, Monteil, & Genestoux, 2001). In fact, in these studies (hereafter referred to as the *comparison choice studies*), the performance of middle school (grade 6) children in a variety of academic domains (math, biology, etc.) was more likely to improve if they compared their exam grades with specific classmates who performed (slightly) *better* than themselves. In addition, choosing a more capable classmate (upward comparison) did not lower students' perceived relative standing in class ('how do you compare with most of your classmates?'), suggesting that students found their upward targets to be inspirational rather than threatening (Collins, 1996;

Lockwood & Kunda, 1997, 1999). This pattern seems hard to reconcile with Marsh and colleagues' view of higher-ability schools as producing invidious, ego-deflating comparisons.

*Resolving the Discrepancy : An earlier attempt*

Wheeler and Suls (2005) noted that the discrepancy between results of BFLPE studies and comparison choice studies may be more apparent than real if one recognizes the two streams of research involve different types of social comparison. In the comparison choice studies, participants nominated whom they deliberately compared with in the classroom; these can be considered as self-initiated or *deliberate* comparisons. In contrast, the BFLPE is assumed to result from *forced* comparisons with the entire class or school (e.g., Diener & Fujita, 1997; Marsh, Hau, & Craven, 2004). Indeed, in the classroom (as well as many other natural settings), feedback about relative performance standing probably is also acquired through forced social comparison even if the student is indifferent or wants to avoid it (Brickman & Bulman, 1977; Levine, 1983; Wood, 1996). The distribution of grades (but possibly not the names) are often read aloud by the teacher or posted on a bulletin board so that each student knows exactly how he/she stands relative to his/her classmates. Such practices may have negative effects on students' behavior, particularly when this information forces unfamiliar upward comparisons (e.g., Huguet, Monteil, & Dumas, 2004; Monteil & Huguet, 1999).

If comparison choices and the BFLPE rely on different kinds of social comparison processes, then the fact that students choose more talented classmates with whom to compare, but also are affected by their relative standing with respect to the entire class or school is not so surprising. In the classroom context, both deliberate and

forced upward social comparisons may coexist. According to Wheeler and Suls (2005), students in both low- and high-ability schools deliberately select classmates with *slightly better* grades (and therefore attainable accomplishments) as comparison targets, but those in high-ability schools are also involuntarily exposed to ‘superstars’ (whose accomplishments might be seen as unattainable), and thus suffer a decline in self-concept (e.g., Lockwood & Kunda, 1997). The net result of these factors is a lower academic self-concept in the high-ability schools or classes.

To examine the possibility that upward comparison choices co-exist with the BFLPE, the authors collaborated (Seaton et al., 2008) in a secondary analysis of the comparison choice data studies (Blanton et al., 1999 ; Huguét et al., 2001) using a more rigorous statistical technique, multilevel modeling (for earlier research on comparison choice using this technique, see Chanal & Sarrazin, 2007 ; Dumas, Huguét, Monteil, Rastoul, & Nezlek, 2005). Upward comparison choices were dominant, and were associated with higher (T2) grades (while controlling for T1 grades). These comparisons with more talented classmates were generally uncorrelated with students’ perceived relative standing in class, indicating that students could keep their chosen comparison distinct from overall class standing (the few associations found in the reanalysis between comparison-level choice and perceived relative standing were positive rather than negative). Above all, the *higher* the average ability of a class, the more *inferior* students felt they were to most of their classmates (controlling for students’ individual levels)—a contrast effect.

The reanalysis by Seaton et al. (2008), however, had two major limitations. The comparison choice studies did not use standardized achievement tests, which made the (post-hoc) assessment of class-average ability (based on students’ grades) not



completely satisfactory. More critically, because the choice studies were not originally designed to test the BFLPE, student academic self-concept was not assessed in those studies. In Seaton et al.'s (2008) reanalysis, therefore, neither the BFLPE nor *a fortiori* the mediating role of invidious comparisons in this phenomenon could be estimated.

Adding further complications to this literature is the Marsh et al. (2008b) BFLPE study, in which students were asked to self-evaluate against their comparison target (« in terms of achievement level, is the comparison student: better than you? not as good as you? similar to you? »). Consistent with their *a priori* predictions based on BFLPE research, Marsh et al. (2008b) found a negative effect of school-average ability (the BFLPE) and a negative (contrast) effect of deliberate upward comparison ; choosing a comparison target who was perceived to be more able was associated with *lower* academic self-concept. Why did upward comparison choice in this more recent study result in contrast whilst it did not previously (Blanton et al., 1999 ; Huguet et al., 2001) ? In the earlier choice studies, participants were not asked how good they were compared to their selected comparison target. Students' actual grades (taken from official school grade records) were used to determine their academic level and that of their targets, and so comparison-level choice (the academic level of the specific classmate with whom students chose to compare) was 'absolute' rather than 'relative'. This distinction is interesting, as students may benefit from high comparison-level choices only when they do not think about these choices in a way that might make them feel worse by comparison. In line with this idea, Gibbons, Blanton, Gerrard, Buunk, and Eggleston (2000) found that college students were more likely to do well in school if they reported (based on a scenario) comparing with other students who scored high on tests, but they were not helped if they reported comparing to specific others who had

done better than them. However, there were limitations to this interpretation for at least two reasons. Gibbons et al. (2000) measured comparison choices that were hypothetical (participants had to imagine a scenario and then indicated how they thought they might respond), which did not necessarily reflect actual comparison habits in the classroom (as noted by Gibbons et al. themselves). In addition, Marsh et al. (2008b) did not include an absolute comparison-level choice measure, whereas Blanton et al. (1999) and Huguet et al. (2001) did not include a relative comparison-level choice measure (as also noted by Marsh et al., 2008a). Hence, there is need for further research into the distinction between absolute and relative comparisons—one focus of the present investigation.

#### The present study

This study builds on Seaton et al. (2008) by including both standardized achievement tests and a psychometrically sound measure of academic self-concept (e.g., Marsh, 1990b), but also went further. Our first goal was to conduct a direct test of the assumption that forced upward social comparison with the entire class underlies the BFLPE. If this is the case, then (i) the higher the average ability of a class, the more students should feel inferior to their classmates taken as a whole (while controlling for individual differences in ability); (ii) the more students feel inferior to their class, the lower their academic self-concept, and more importantly, (iii) the BFLPE should be eliminated after controlling for students' perceived relative standing in class. This (multilevel) mediational finding (for the notion of multilevel mediation, see Krull & MacKinnon, 1999, 2001) should strengthen our confidence that the BFLPE is rooted in invidious, ego-deflating comparisons with the class standard.

A second aim was to investigate students' comparison-level *choice* at the class level and its influence on academic self-concept in the context of the BFLPE. What

remains unclear so far is whether and how the average ability of a class influences comparison-level choice, and perhaps more importantly, whether and how comparison-level choice is associated with academic self-concept. If high ability classes imply invidious comparisons with the class standard, students could make up for a relatively painful experience with a happy one, through comparisons with the few classmates perceived as more incapable than themselves (downward comparisons, Wills, 1981). According to this view, the higher the ability of a class, the lower the comparison-level choice (while controlling for individual differences in ability). As noted by Biernat (2005), however, even upward comparisons may result in self-enhancement, through assimilation to the more successful targets (e.g., Wheeler, 1966, Collins, 1996), a phenomenon that may be intensified in high ability classes. Because comparing upward may also result in self-improvement (e.g., Gibbons et al., 2002 ; Major, Testa, & Bylsma, 1991 ; Taylor & Lobel, 1991 ; Wheeler & Miyake, 1992 ; Wood, 1989, 1996), the downward trend seems less likely than the upward trend.<sup>1</sup> Downward comparison choices typically do not help to self-improve (for a similar argument, see Gibbons et al., 2000 ; Gibbons, Lane, Gerrard, Reis-Bergan, Lautrup, Pexa, & Blanton, 2002), and are therefore not adaptive in high ability classes where outstanding outcomes are expected. Consistent with this idea, Goethals and Darley (1987) suggested that the « unidirectional drive upward » postulated by Festinger (1954) in the case of abilities originates in the pressure toward achieving high performances in the school system, and this pressure is certainly exacerbated in high ability classes. Thus, there are reasons to expect higher class-average ability to be associated with higher comparison-level choice (after controlling for individual differences in ability).

Likewise, there are reasons to expect higher comparison-level choice to be associated with higher academic self-concept. It is already known that higher comparison-level choice is associated with higher grades (Blanton et al., 1999; Huguet et al., 2001; Seaton et al., 2008), a behavioral assimilation tendency (Dijksterhuis & van Knippenberg, 1998). If deliberate comparisons with upward targets lead to self-enhancement, we should also expect positive academic self-evaluations to result from such comparisons. This cognitive upward assimilation tendency would be the direct opposite of that associated with the forced invidious comparisons assumed to underlie the BFLPE.

Wheeler and Suls (2007) defined cognitive upward assimilation as an “increase in the comparer’s self-evaluation on a dimension as a result of comparing with someone better on that dimension” (pp. 31-32). Although assimilation to an upward target had not received much attention until fairly recently (Collins, 1996), it was demonstrated very early in social comparison research (Wheeler, 1966). Based on the hypothesis that the selection of upward targets may result in self-enhancement, Wheeler (1966) offered direct evidence that the comparer can assume similarity with the more successful targets (for a recent replication of Wheeler’s original findings, see Collins, 2000). In line with this idea, cognitive assimilation is typically thought to result from the construal of the self as similar rather than different from the comparison target (Biernat, 2005; Collins, 1996, 2000 ; Nosanchuk & Erickson, 1985; Wheeler & Suls, 2007). Laboratory research indicates that upward assimilation is likely when people expect and test for similarity with their more successful comparison others (e.g., Collins, 1996, 2000; Mussweiler & Strack, 2000a, 2000b), or when they have the time and can hope and strive to match the more successful others around them (e.g., Aspinwall, Hill, & Leaf, 2002 ; Carver &

Scheier, 1998; Lockwood & Kunda, 1997). So far, however, enhanced academic self-concept associated with upward comparison choices has not been demonstrated. Here, not only was this possibility examined, but perceived similarity with the comparison target was also measured, as suggested by the Selective Accessibility Model of social comparison (Mussweiler, 2003a, 2003b; Mussweiler & Strack, 2000b).

According to the Selective Accessibility Model, comparing oneself to a given standard may selectively increase the accessibility of standard-consistent knowledge about the self. Thus, after a comparison with a relatively high standard, the accessibility of knowledge indicating that one's standing is *similar* to the standard (knowledge indicating a high standing of the self) may be increased. On this basis, we expected a positive relationship between students' absolute comparison-level choice and perceived similarity in past grades with their comparison target (e.g., how frequently did you and your comparison target get the same math grades in the past two trimesters?), an assimilative trend that was not tested in the previous comparison choice studies.

According to the Selective Accessibility Model, there is also reasons to believe that evaluating the self in comparison to a salient standard not only renders a standard-consistent subset of self-knowledge more accessible (such as self-other similarities in grades), it also suggests a reference point against which implications of this knowledge can be evaluated. Using the comparison standard as a reference point for self-evaluation, however, is likely to produce a contrast effect. On this basis, we predicted that a contrastive trend should occur when reference point use is made salient, that is, when the students are asked to self-evaluate against their upward (selected) targets (e.g., how good are you in math relative to your comparison choice?, see Marsh et al., 2008b). This comparative judgment was not integrated in the earlier comparison choice studies

(Blanton et al., 1999; Huguet et al., 2001). Thus, based on the Selective Accessibility Model we were able to predict that assimilation and contrast may result from a *single comparison choice*, depending on how relevant the two respective types of informational consequences of comparison (i.e., standard-consistent knowledge about the self vs. reference point use) are for the required judgment.

Stapel and Koomen's (2000, 2001) Interpretation Comparison Model (see also Stapel & Suls, 2004) is of particular interest as well, as it also leads to predict that assimilation and contrast may result from a single comparison choice. According to the Interpretation Comparison Model, social comparison can serve dual roles with opposite effects. It can serve as a standard against which the self is evaluated, resulting in contrast effects, which are especially likely when social comparison is forced and the focus is on self-evaluation (Stapel, 2007) as was probably the case in research on the BFLPE and Marsh et al.'s study (2008b) where the students were explicitly asked to self-evaluate against their comparison targets. Alternatively, social comparison can provide an *interpretative frame*, leading to assimilation effects. This alternative is especially likely when the self-concept is relatively mutable, as would be expected for school children, and when self-evaluation against the comparison target is not highly salient (when the focus is on self-definition rather than self-evaluation, see Stapel & Suls, 2004)—as was probably the case in the earlier (absolute) comparison choice studies (Blanton et al., 1999; Huguet et al., 2001). According to the Interpretation Comparison Model, imposed comparative evaluations may turn what is potentially an interpretative frame into an evaluative standard. If this is the case, the higher the average ability of a class, the more inferior students should feel to their comparison

target, and the more student feel inferior to their target, the lower their academic self-concept.

In sum, both the Selective Accessibility and Interpretation Comparison models predict that imposed comparative evaluations against the comparison target should lead to relationships opposite to those expected from absolute comparison-level choice. Assimilation and contrast related to comparison choice were expected here in the context of the BFLPE, which itself represents a contrast effect at a more integrated level, between the self and the perceived abilities of the class taken as a whole (rather than specific classmates). Because cognitive upward assimilation (on academic self-concept) and contrast effects such as the BFLPE are opposing forces, it was predicted that controlling for the former should result in purer –and even more negative– contrast (BFLPE) effects (a suppression effect rather than a mediation effect, see MacKinnon, Krull, & Lockwood, 2000). We also expected the BFLPE to be reduced, but not eliminated, when controlling for the expected contrastive evaluations against comparison choice. If the BFLPE is rooted in invidious comparisons with the class standard, we reasoned, it should remain clearly significant when removing contrast effects arising from imposed comparative evaluations with specific-*selected* classmates. These findings would add further evidence that the BFLPE is rooted in *forced* upward comparisons with the class taken as a whole.

## Method

### *Sample*

Participants were 2015 students (989 girls and 1026 boys) in their first year of secondary school (i.e., grade 6, 12-14 years old), from 99 classes across 16 French (public) schools, who agreed to take part in the present study described as a research on

students' habits, motivations, and grades (it was indeed part of a larger project in collaboration with school administrators). Student consent and permission from all appropriate authorities were obtained. At the beginning of the school term, all students and parents were informed about the study by teachers at each school (under the supervision of their school administrators). All students, parents, and teachers were given the opportunity not to participate. Only 91 students (4.51%) were not allowed by their parents to participate (2106 students were originally contacted). Participants had been assigned by school administrators to one of the 99 classrooms, with 16 to 28 students in each class and 4 to 8 classes per school. The schools involved both urban and suburban areas and different socioeconomic status. They were randomly selected from among other schools classified as high, medium, and low on the basis of two national standardized academic achievement tests (see next section), one in Math and the other in French. There were 5 high-achievement schools that were defined as those scoring one standard deviation above the mean compared to schools located in the same geographical area, there were 6 low-achievement schools (1 SD below the mean), and the remaining 5 scored close to the mean (medium-achievement schools). Students attended all courses with the same classmates, and each classroom had a similar curriculum. Each course was taught by a teacher who typically taught only that topic.

### *Procedure*

Similar to the comparison choice studies (Blanton et al., 1999; Huguet et al., 2001), the present investigation took place during a transition period. This was the students' first year in a new school, and so they were adjusting to new procedures and, for most of them, to new classmates. The French secondary school also presents students with a more challenging curriculum than the one they experience in primary



school (for more details about this transition period, see Huguet et al., 2001). The French secondary school system uses a trimester system. Student ability data (standardized test scores) were collected at the beginning of the first trimester (September). All other measures were collected at the end of the second trimester (April). Questionnaires were administered in class to all students in attendance. Teachers had been instructed about how to administer the questionnaires, which were completed anonymously. Ability and questionnaire responses were matched on the basis of a code number assigned to each student.

### *Measures*

*Standardized Academic Achievement Tests (Students' ability).* The two National standardized academic achievement tests offered comparable scores in Math and French on a common metric for all students from different classes and schools. These tests (designed for sixth-graders alone) were used to assess individual ability (hereafter referred to as "students' ability"), class-average ability, and to determine the ability of students' comparison choice ("comparison-level choice") in the two academic domains.

*Academic Self-Concept.* The standard 6-items self-concept scale (Marsh, 1990b) was used to assess academic self-concept both in Math and French. A 6-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*), was used to score these items, including for example "you learn things quickly in Math" and "you are hopeless when it comes to French". Negative items were reverse scored so that a higher score indicated a higher academic self-concept (Cronbach alphas = .88 and .89, for Math and French, respectively).

*Perceived Relative Standing in Class.* As in earlier studies (see Blanton et al., 1999; Huguet et al., 2001), students were asked how good they were compared to most

of their classmates in Math and French. These two comparative evaluation ratings were made on a 5-point scale (1 = *much better*, 3 = *the same*, 5 = *much worse*). Participants were also told that if they were unsure, they could indicate this, in which case their data were dropped from analyses using this measure.

*Absolute Comparison-Level Choice.* Comparison choices were measured as before (Blanton et al., 1999; Huguet et al., 2001), by asking students to nominate the classmate with whom they preferred to compare their grades in French and Math courses. Participants listed the subject code numbers of their comparison-targets with a list where all students of their class and their code numbers were indicated. They were told that they could leave this item blank if they did not usually compare their grades. Because the comparison-targets' standardized tests were used to determine comparison-level choice in Math and French, any relationship between students' own ability and ability of their comparison choice could not be due to a self-report bias.

*Similarity with Absolute Comparison-Level Choice.* Students rated how frequently their comparison choice got the same grades as theirs in Math and French during the past two trimesters. These two ratings were made using a 5-point scale (1 = *never*, 2 = *sometimes*, 3 = *one time out of two*, 4 = *often*, 5 = *always*). Unlike the next questionnaire item described below, the perceived similarity item did *not* force students to rate how good they were relative to their comparison choice. By simply focusing on the frequency of self-other similarity in past grades, this item offered the possibility to see the self as similar rather than different from the comparison target, despite the existence of some objective differences (cognitive assimilation).

*Comparative Evaluation with Social Comparison Choice (also called relative comparison-level choice).* Students rated how good they were relative to their

comparison choice in Math and French, and so self-evaluation was made highly salient on this item (expected to be associated with contrast effects). These ratings were made on a 5-point scale (1 = *much better*; 3 = *the same*; 5 = *much worse*). Participants were also told that if they were unsure, they could indicate this, in which case their data were dropped from analyses using this measure.

## Results

### *Overview of analyses*

We treated the data as a hierarchically nested data structure (students nested within classes), and analyzed them with a series of multilevel random coefficient models using the program HLM (Raudenbush, Bryk, Cheong, & Congdon, 2004). All analyses were done in parallel. One set of analyses concerned Math, and a second set (identical in structure) concerned French. The analyses focused on student level (within-class) relationships. Within the nomenclature of multilevel modeling, we added predictors to the level-1 model. Following the advice of multilevel modelers (e.g., Nezlek, 2001; Raudenbush & Bryk, 2002), we used a “forward-stepping” procedure (adding predictors to simpler models) rather than a “backward stepping” procedure (starting with more complex models and deleting predictors).

Our analyses of academic self-concept were conducted with the BFLPE as the starting point. In the nomenclature of multilevel modeling, the BFLPE represents what is called a contextual effect, and it requires two specific features to be modeled. First, a dependent measure (academic self-concept) is modeled as a function of a predictor (students’ ability) that is grand-mean centered (or standardized beforehand). Second, the resulting intercept is predicted at level 2 as a function of the class average of the level 1 predictor (students’ ability). When using a grand-mean centered predictor, the intercept

for each group (each class) represents the expected value for an observation (student) within each group that is at the grand mean of a predictor – i.e., the grand mean of ability. In essence, the intercept from such an analysis is an adjusted mean – adjusted for between group differences in the predictor (for a more detailed description of modeling contextual effects, see Raudenbush & Bryk, 2002). This is the standard technique that has been used to demonstrate the BFLPE in previous research (e.g., Marsh & Hau, 2003), and the base equations for this model are below:

$$y_{ij} = \beta_{0j} + \beta_{1j} (\text{Student Ability}) + r_{ij}$$

$$\beta_{0j} = \gamma_{00} + \gamma_{01} (\text{Class-Average Ability}) + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} (\text{Class-Average Ability}) + u_{1j}$$

In these equations,  $y_{ij}$  was an individual level measure for  $i$  persons in  $j$  classes, and  $\beta_{0j}$  was the mean for  $j$  classes. The variance of  $r_{ij}$  was the within-class variance, and the variance of  $u_{0j}$  was the between-class variance. All coefficients were initially modeled as random, and coefficients were fixed following guidelines offered by Nezlek (2001). All predictors were entered uncentered. Because all variables were standardized before the analyses, entering predictors uncentered was functionally equivalent to entering them grand-mean centered. The BFLPE reflects the fact that there is a negative relationship between these adjusted means (intercepts) and the average ability in a class (the  $\gamma_{01}$  coefficient). As class-average ability increases, the expected self-concept for a student with average ability (average defined in terms of the entire population) decreases.

Student level variables (e.g., perceived relative standing in class, comparison-level choice), were then added to the level 1 model. For each student level variable in each academic domain, we performed a series of separate analyses in three steps (while

controlling for students' ability). First, we estimated relationships between class-average ability and the student level variable of interest. Second, we estimated relationships between this variable of interest and academic self-concept. Third, we re-estimated the coefficients representing the BFLPE after controlling for this same student level variable (for conceptually similar multilevel analyses in three steps, see Krull & MacKinnon, 2001).

As shown in the level 2 equation for the slope for ability ( $\beta_{1j}$ ), class-average ability was also included as a predictor for all slopes in all analyses. This was done because we were interested in knowing if slopes varied as a function of class-average ability. Second, multilevel modelers agree that predictors that are included in one level 2 equation should appear (at least initially) in all level 2 equations (e.g., Raudenbush & Bryk, 2002).

To interpret these cross-level effects, the corresponding models were estimated for classes +/- 1 SD on class-average ability, and self-concept scores were estimated for students who were +/- 1 SD on students' ability, and on the student level variable of interest (for an example of calculating and interpreting interaction terms involving cross-level effects, see Nezlek & Plesko, 2003). Finally, as generally suggested by multilevel modelers, the within-level interaction between students' own ability with the student level variable of interest was included in all analyses of the BFLPE (i.e., in all analyses where academic self-concept was used as dependent variable).

#### *Missing data*

Standardized test data were missing for some students (< 5% in Math and French), which meant that some comparison-level choices were also missing when these students were nominated as comparison targets. Likewise, some targets with

standardized test data could not be identified (6% and 7% in Math and French, respectively). When removing the non-identifiable targets, the percentages of missing data for the comparison choices reached 11.5% and 13% in Math and French, respectively. Participants could opt not to nominate a comparison target (7.38% in Math and 7.75% in French, hereafter referred as the ‘non-choosers’), so abstentions were not counted as missing data. There were minimal missing data for the other questionnaire items, with the average percentage being 0.34% (SD = 0.19%). Only valid cases were used in each analysis reported below. All analyses were also conducted using multiple imputation of missing data, a technique based on the Expectation Maximisation algorithm (see Schafer & Graham, 2002 ; Tabachnick & Fidell, 2007). This technique overcomes problems typically associated with missing data efficiently (Carpenter & Kenward, 2007), and it did not change the basic findings.

### *BFLPE*

Consistent with past research on the BFLPE, whereas the relationship between students’ ability and self-concept was positive in both Math ( $\gamma_{10} = .67, t = 20.39, p < .001$ ) and French ( $\gamma_{10} = .50, t = 14.85, p < .001$ ), there were negative relationships between class-average ability and self-concept in Math and French (Math,  $\gamma_{01} = -.47, t = 6.90, p < .001$  ; French,  $\gamma_{01} = -.45, t = 8.66, p < .001$  ; see Table 1).<sup>2</sup> This negative relationship was moderated by students’ ability in both Math ( $\gamma_{11} = .13, t = 2.66, p < .01$ ) and French ( $\gamma_{11} = .22, t = 4.56, p < .01$ ). Although the BFLPE occurred across all ability levels (in line with past relevant research), it was stronger in low-ability students compared to high-ability students (this interaction is discussed later).

Insert Table 1

### *BFLPE and Perceived Relative Standing in Class*

The first variable of interest was students' perceived relative standing in class, because it is thought to be responsible for the BFLPE. Before it was included in the model, we tested its relationship with class-average ability (while controlling for students' ability). Consistent with Seaton et al.'s (2008) findings, the *higher* the class-average ability, the more students felt *inferior* to their class in both Math ( $\gamma_{01} = .59, t = 9.23, p < .0001$ ) and French ( $\gamma_{01} = .59, t = 10.84, p < .0001$ ).

In addition, for both subjects, the more students felt inferior to their class, the lower their academic self-concept (Math,  $\gamma_{20} = -.60, t = 25.42, p < .001$ ; French,  $\gamma_{20} = -.69, t = 34.34, p < .001$ ). Above all, and consistent with our expectation, including perceived relative standing in class rendered the BFLPE non significant for both academic domains (see Table 2). As would be expected given these findings, further analyses of multilevel mediation modeling based on the Sobel test (Krull & MacKinnon, 1999; 2001) confirmed the elimination of the BFLPE in Math and French (see Figures 1a & 1b).

Insert Table 2 & Figures 1a & 1b

#### *Absolute Comparison-Level Choice*

*Preliminary analyses.* Consistent with prior comparison choice studies (Blanton et al., 1999; Huguet et al., 2001), students nominated classmates who (on average) were somewhat better than themselves in Math and French. These analyses used a difference score: ability of students' comparison choice minus students' own ability (on the achievement tests). For both Math and French, the intercept of an unconditional model of these measures indicated a small positive difference between ability of comparison choice and own ability, which was significantly different from 0 (Math,  $\gamma_{00} = 1.74, t = 4.72, p < .001$ ; French,  $\gamma_{00} = 1.32, t = 4.37, p < .001$ ). Because social comparison in

class relies on grades (rather than ability that students can at best infer from grades), the same analysis was conducted with comparison targets' grades and students' own grades as dependent measures. For both Math and French, the intercept of an unconditional model of these measures (both taken at T2) again indicated a small positive difference that differed significantly from 0 (Math,  $\gamma_{00} = .55$ ,  $t = 6.93$ ,  $p < .001$ ; French,  $\gamma_{00} = .49$ ,  $t = 7.77$ ,  $p < .001$ ). Thus, students chose comparisons with classmates who were somewhat more successful in Math and French, based on two indices.<sup>3</sup> Also consistent with the previous comparison choice studies, a positive relationship was found between students' absolute comparison-level choice (ability of students' target) and students' T2 grades, while controlling for their T1 grades. The higher the ability of students' comparison choice, the higher their own T2 grades in Math ( $\gamma_{20} = .11$ ,  $t = 5.68$ ,  $p < .0001$ ) and French ( $\gamma_{20} = .10$ ,  $t = 5.50$ ,  $p < .0001$ ). More importantly for the present paper, and as expected, the higher the class average ability, the higher the absolute comparison-level choice (based on ability-level or standardized test scores) in Math ( $\gamma_{01} = .68$ ,  $t = 14.32$ ,  $p < .0001$ ) and French ( $\gamma_{01} = .71$ ,  $t = 14.30$ ,  $p < .0001$ ), after controlling for individual differences in ability. The same results were found when absolute comparison-level choice was based on targets' grades (rather than ability or standardized test scores).

#### *Cognitive Assimilation with Absolute Comparison-Level Choice*

Consistent with the cognitive assimilation hypothesis, we found a positive relationship between absolute comparison-level choice and academic self-concept in Math ( $\gamma_{20} = .09$ ,  $t = 3.65$ ,  $p < .001$ ) and French ( $\gamma_{20} = .09$ ,  $t = 3.09$ ,  $p < .002$ ), after controlling for individual differences in ability (see Table 3). These slopes did not vary as a function of class-average ability, indicating that absolute comparison-level choice



did not interact with the BFLPE. Again, the same results were found when absolute comparison-level choice was based on targets' grades (rather than ability or standardized test scores).

Also crucial for the cognitive assimilation hypothesis was whether students felt similar to their more capable comparison targets when they rated the frequency of self-target similarity in past grades. As expected, the higher the absolute comparison-level choice, the more similar students felt to their comparison targets, after controlling for students' ability. This positive relationship was obtained for both Math ( $\gamma_{20} = .09$ ,  $t = 2.89$ ,  $p < .004$ ) and French ( $\gamma_{20} = .12$ ,  $t = 3.56$ ,  $p < .001$ ). Thus, although students compared objectively upward (on average), they also viewed themselves as *similar* to their comparison target, providing direct evidence of cognitive upward assimilation.

Given that absolute comparison-level choice was associated with assimilation rather than contrast, the size of the BFLPE should *increase* (not decrease) when comparison-level choice is controlled, and this is exactly what we found. The size of the BFLPE changed from  $-.47$  to  $-.55$ , in Math, and from  $-.45$  to  $-.55$ , in French (both  $ps < .001$ ; see Figures 2a & 2b).

Insert Table 3 and Figures 2a & 2b about here

#### *Cognitive Contrast with Relative Comparison-Level Choice*

First, we tested the relationship between class-average ability and students' comparative evaluation relative to their target. As expected, the higher the class-average ability, the more *inferior* students felt relative to their comparison target in Math ( $\gamma_{01} = .30$ ,  $t = 5.41$ ,  $p < .0001$ ) and French ( $\gamma_{01} = .30$ ,  $t = 5.93$ ,  $p < .0001$ ), after controlling for individual differences in ability.

We then tested the relationship between students' comparative evaluation against their target and academic self-concept. Consistent with our expectations (based on the Selective Accessibility and Interpretation Comparison models) and Marsh et al.'s (2008b) findings, the more students felt inferior to their comparison target, the lower their academic self-concept (Math,  $\gamma_{20} = -.26$ ,  $t = 13.70$ ,  $p < .001$ ; French,  $\gamma_{20} = -.29$ ,  $t = 12.63$ ,  $p < .001$ ), controlling for individual differences in ability (see Table 4). These slopes did not vary as a function of class-average ability ( $t < 1$  in Math, and  $t = 1.19$ , *ns*, in French), indicating that students' comparative evaluations with their targets did not moderate the BFLPE. Also as expected, whereas the BFLPE decreased substantially (from  $-.47$  to  $-.39$  in Math, and from  $-.45$  to  $-.38$  in French; both  $ps < .001$ ) after controlling for these contrastive evaluations, it remained clearly significant in both academic domains (both  $ps < .001$ ; see Figures 3a & 3b).<sup>4</sup>

Insert Table 4 & Figures 3a & 3b about here

### Discussion

It has been speculated for sometime that the BFLPE is a consequence of invidious social comparisons experienced in higher ability schools. However, the direct role of such comparisons for the BFLPE has not heretofore been documented. This study comprises the *first evidence* that the BFLPE 1) is eliminated after controlling for students' invidious comparisons with their class, and 2) coexists with the assimilative and contrastive effects of upward social comparison choices on academic self-concept (Wheeler & Suls, 2005). In addition, the results offer support for integrative approaches of social comparison (Selective Accessibility and Interpretation-Comparison models) in a natural setting. They also lend support for the distinction between forced and deliberate social comparisons (Wood, 1996) and the usefulness of distinguishing

between absolute and relative comparison-level choice in self-assessment. Thus, beyond their contribution to research on the BFLPE, the present findings also add to our knowledge of social comparison *per se*.

*Specific Contribution to Research on the BFLPE*

Research on the BFLPE has been criticized for not providing direct evidence that social comparison drives the phenomenon (Dai, 2004; Dai & Rinn, 2008). The elimination of the BFLPE after controlling for students' perceived standing relative to most of their classmates offers direct evidence that this effect is rooted in *how students compare with their class taken as a whole*, a comparison which proved to be more invidious as class average ability increased. On purely theoretical ground, Dai and Rinn (2008) also questioned the social roots of the BFLPE. This is valid concern because past BFLPE research has mainly relied on school-average ability, so exactly what reference group(s) students used for their comparative evaluations remained unclear. The present findings provide an answer: students' perceived standing relative to most of their classmates (those in the same class as them) plays a major role in the BFLPE.

The comparison choice findings also show that the BFLPE has more to do with *how* students compare with their classmates than with *whom* they prefer to compare. Consistent with earlier comparison choice findings (Blanton et al., 1999; Huguet et al., 2001), students on average selected a classmate who was somewhat more talented than themselves but who they spontaneously perceived to be of the *same* ability as themselves (based on the perceived similarity ratings). This finding offers evidence of upward cognitive assimilation (consistent with Collins, 1996, 2000 ; Mussweiler & Strack, 2000a, 2000b; Wheeler, 1966; Wheeler & Suls, 2005), which also strengthens our confidence that upward comparison choices may result in self-enhancement.

Consistent with this argument, and perhaps more importantly, the higher the absolute comparison-level choice, the higher the academic self-concept, after controlling for individual differences in ability. This observation is especially critical for research on the BFLPE, which has also been criticized for having disproportionately emphasized the dark side of social comparison where individuals essentially suffer from the presence of more competent peers (Dai 2004; Dai & Rinn, 2008). In their critical review of the BFLPE, Dai and Rinn (2008) offered (but did not test) a broader conception of social comparison effects on academic self-concept, suggesting that individuals also make strategic use of social comparison (Wood, 1989). Central to this conception is the distinction between at least two types of social comparison in the context of the BFLPE: how students compare with most others around them under the pressure of the environment (forced comparisons) and with whom they prefer to compare for adaptive purposes (deliberate comparisons). This is exactly the distinction made throughout the present paper, and it is supported by our findings. The present data indeed teach us that the invidious comparisons underlying the BFLPE do not exclude high absolute comparison-level *choices*, which proved to be positively associated with academic self-concept.

Based on the argument that research on the BFLPE focuses exclusively on forced/invidious upward comparison at the expense of potentially beneficial deliberate upward comparisons, Dai and Rinn (2008) suggested that the BFLPE might be reduced in students who deliberately compare themselves with their superior classmates. However, this is not what we found. Consistent with the coexistence hypothesis (Seaton et al., 2008; Wheeler & Suls, 2005), the BFLPE did not interact with students' absolute comparison-level choice. Moreover, whether students indicated they had or had not a

comparison other in class made no difference for the BFLPE (see Footnote 2). Because assimilation and contrast effects are opposing forces, we predicted that controlling for the former should result in stronger, more negative contrast (BFLPE) effects. Consistent with this prediction, the negative contrast (BFLPE) effects became stronger after adjusting statistically for the positive relationships between absolute comparison-level choice and academic self-concept. Likewise, we found (as predicted) that the BFLPE was reduced, but not eliminated, when controlling for the expected contrastive evaluations against comparison choice. Taken together, these additional findings suggest that the BFLPE is the net effect of counterbalancing influences: stronger negative contrast effects associated with forced exposure to invidious comparisons at the class level and weaker assimilation effects associated with upward social comparison choices. Thus, it seems reasonable to conclude that beyond the relatively uncontrollable comparisons underlying the BFLPE, students may still exercise considerable choice over the target with whom they compare, with sometimes a beneficial effect on their academic self-concept (see also Biernat, 2005, for a similar argument). As Gilbert, Giesler, and Morris (1995) put it, “a lack of complete control is not a complete lack of control” (p. 233).<sup>5</sup>

More generally, the present research offers a ‘new look’ to the BFLPE. It is now clear that this phenomenon is rooted in students’ invidious comparisons with their whole class, and also coexists with the assimilative as well as contrastive effects of upward social comparison choices on academic self-concept. In addition, the relatively complex pattern of assimilative and contrastive trends predicted and found in our research are consistent with integrative approaches of social comparison, such as the

Selective Accessibility and Interpretation Comparison models, which here receive support in the natural context of school.

*Specific Contribution to Research on Social Comparison*

According to the Selective Accessibility Model (Mussweiler, 2003a, 2003b; Mussweiler & Strack, 2000b), comparing oneself to a given standard may selectively increase the accessibility of standard-consistent knowledge about the self, which might result in upward assimilation after a comparison with a relatively high standard. Consistent with this model, not only were higher (absolute) comparison-level choice associated with higher academic self-concept, but the higher (absolute) comparison-level choice, the more students felt *similar* to their comparison targets (after controlling for ability). Whether such similarity judgments resulted from either selectively ignoring grades that were worse than those of the comparison choices, reconstructing lower grades as almost as good as those of the comparison choices, or even from really misremembering grades, is not specified here. Although future research is needed on this important point, the present findings are clearly consistent with the Selective Accessibility Model in a naturalistic setting. More generally, the use of upward assimilation in the literature heavily relies on the idea that the comparer can assume similarity with the more successful targets (e.g., Biernat, 2005). It is therefore surprising that similarity judgements after upward comparison have not received much empirical attention since Wheeler's (1966) original work. The present findings also help strengthen this important point. These findings may give the impression that cognitive assimilation worked better in the case of strongly (rather than slightly) upward comparison choices. Again, however, most students actually engaged in *slightly* upward

comparisons (exactly as Festinger would predict), and so it seems that they simply assumed greater similarity with those slightly above them than with those below.

Our findings also offer support for the Interpretation Comparison Model (Stapel & Koomen, 2000, 2001; Stapel & Suls, 2004). According to this model, assimilation effects are likely when social comparison serves as an interpretative frame, which implies the self to be perceived as relatively mutable and self-evaluation against the comparison target to be not highly salient. This was probably the case during target selection. Not only was comparative evaluation not part of the nomination task *per se*, but the present study was conducted during the transition from primary to secondary school (as also were the previous comparison choice studies; Blanton et al, 1999; Huguet et al., 2001) when most students may feel uncertain about themselves in their new environments (Simmons, 1987). In combination, these two basic features probably enhanced the interpretative aspect of social comparison choice. Thus, the present assimilation findings related to social comparison-level choice in the context of the BFLPE may also be taken as first evidence of interpretative and comparative processes arising in the classroom setting.

Also consistent with both the Selective Accessibility and Interpretation Comparison models, and Marsh et al.'s (2008b) findings, contrastive rather than assimilative trends were found whenever students were asked to self-evaluate against their comparison targets. Comparison-level choice reflecting, on average, a slightly upward tendency (as would also predict Festinger, 1954), this additional finding shows how problematic even deliberate comparisons with better-off others can be when self-evaluation is both highly salient and forced by the situation (as in the BFLPE). As suggested earlier in this paper, it seems that students can benefit from high comparison-

level choices only when they do not think about their targets in a way that might make them feel worse by comparison (Gibbons et al., 2000). Of particular interest for the distinction between the Selective Accessibility and Interpretation Comparison models, the fact that contrast occurred only when students were forced to self-evaluate against their comparison targets suggests that assimilation was the ‘default mindset’ for most of them, consistent with the Selective Accessibility Model (Mussweiler & Strack, 2000a,b; Mussweiler, Rüter, & Epstude, 2004). According to this model, testing for similarity (typically thought to be associated with assimilation effects) is indeed more common than testing for dissimilarity. According to the Inclusion/Exclusion Model (Schwarz & Bless, 1992), spontaneous assimilation is also likely when the comparer and the selected target belong to the same category, as in our research where more than 80% of participants who chose a comparison target did so within their own gender group (see also Mussweiler & Bodenhausen, 2002; for a review of other models compatible with this interpretation, see Suls & Wheeler, 2000; Biernat, 2005). Thus, assimilative trends seemed to be readily associated in our research with upward target selection (i.e., absolute comparison-level choice). The positive links between absolute comparison-level choice and *academic self-concept* were ignored in past relevant research. Although the comparison choice literature has a long history, the present research is the first to examine these links while integrating both absolute and relative comparison-level choice measures.<sup>7</sup> Whenever students were forced to self-evaluate against their comparison targets (relative comparison-level choice), contrastive trends occurred, which offers first evidence for simultaneous assimilation and contrast effects related to social comparison among children in the natural context of school (for first evidence of simultaneous assimilation and contrast effects in social judgments with adults, see



Biernat, Manis & Nelson, 1991). Thus, the present findings can also be taken as evidence that deliberate comparisons taking place within classrooms also matter for the academic self-concept, with sometimes positive and sometimes negative relationships depending on whether self-evaluation is or is not highly salient and forced by the situation.

Finally, none of the assimilative and contrastive trends found in our research interacted with the BFLPE, which strengthens our confidence that the BFLPE has little to do with the selection of specific comparison targets.<sup>6</sup> This does not mean that target selection is unrelated to class-average ability. Quite the contrary: The higher the class average ability, the higher the absolute comparison-level choice (after controlling for individual differences in ability). As noted earlier in this paper, this expected relationship may be taken as evidence that the upward comparison tendency is intensified in high ability classes. Also as expected, the higher the ability of a class, the lower students' comparative evaluations with their comparison targets (still after controlling for individual differences in ability), another contrast effect clearly consistent with both the Selective Accessibility and Interpretation Comparison models of social comparison.

#### *Potential Limitations*

The present research was descriptive and correlational (as most previous BFLPE studies) and so causal interpretations should be made cautiously. Although true random assignment is a desirable design strategy, it is simply not a feasible or ethical alternative for large-scale research in a school setting. In this regard, our investigation should be viewed in the context of the larger body of research on the BFLPE. There is a growing body of research showing that academic self-concept declines when students shift from

mixed-ability schools to academically selective schools –over time and in relation to students matched on academic ability who continue to attend mixed-ability schools (e.g., Marsh, Köller, & Baumert, 2001; Marsh et al., 2008a). Likewise, because features associated with academically selective settings other than achievement grouping *per se* are likely to have a positive effect on subsequent outcomes, the “third variable” problem is not necessarily a threat to BFLPE studies. For example, higher ability schools or classes are likely to be comprised of students from more advantaged SES who have access to more resources. Because of the direction of this bias, interpretations of the negative effects of school- or class-average achievement on academic self-concept are likely to underestimate the BFLPE (for similar arguments, see also Marsh & Hau, 2003; Marsh et al., 2008a).

Although the BFLPE was found across all student ability levels (as in most past relevant research), it was stronger here for the low-ability students than for their high-ability counterparts, suggesting how problematic strongly upward comparisons can be for the academic self-concept. This interaction may seem surprising, however, as the interactions found earlier between the BFLPE and individual student ability levels were typically small in size, generally not significant, and not even consistent in direction (see Marsh et al., 2008a). The present interaction may reflect another unique feature of our research. Because the BFLPE has generally been estimated on very large, nationally representative samples at the school level, it was based on very few students per class (e.g., Marsh et Hau, 2003; Marsh, Walker, & Debus, 1991). Here the BFLPE was estimated at the class level while using *intact classes*, resulting in unbiased estimates of *class-average* ability for each class level. This methodological feature is associated with especially high BFLPE coefficients, -.46 in the base model for the two academic

domains averaged, actually more than twice the size of those reported by Marsh and Hau (2003; -.20), suggesting that the BFLPE may be stronger than previously thought. The use of intact classes may also be responsible for the present interaction between the BFLPE and student ability levels; an interpretation that merits special attention in future research.

#### *Practical Implications and Prospects for Future Research*

Finally, the present findings also contribute to the debate about the practical implications of the BFLPE. They are clearly consistent with the numerous results accumulated by Marsh and colleagues from more than twenty years, showing that higher-ability settings produce academic outcomes that are lower than what would be expected on the basis of the quality of students. This does not mean that *all* bright students will suffer from attending academically selective schools, or that these schools should be closed (for similar arguments, see Marsh et al., 2008a). This rather means that *many* students may suffer lower academic self-concepts, with potentially negative consequences on their academic choices, efforts, and subsequent achievements, compared with what they could experience in less selective schools (for a review, see Marsh et al., 2008a). At the very least, it seems that academic selective schools do not automatically benefit the students who attend them, contrary to a largely uncritical belief. Actually, the BFLPE is so robust that it is not compensated by the pride of the association with the other high-ability classmates (Marsh, Kong, & Hau, 2000) and/or the positive characteristics of higher-ability schools, such as the quality of the education provided (more dedicated, highly trained teachers, better resources) (for reviews, see Hattie, 2002; Marsh & Craven, 2002; Marsh et al., 2008). Thus, less selective otherwise heterogeneous schools may protect students from the BFLPE *while allowing them to*

*benefit from deliberate upward comparisons on academic self-concept* (as well as grades, see Seaton et al., 2008).

This benefit also has a strong implication for the critical question of social comparison in the selective schools where the BFLPE is operating: The struggle against the BFLPE does not imply discouraging any kind of social comparison. Although this solution may be tempting (Marsh & Craven, 2002), the present findings suggest that at least deliberate comparisons can have a beneficial effect on academic self-concept even in higher-ability schools or classes. Thus, the question now is less to discourage any kind of social comparison than to change invidious social comparisons to the whole class into sources of efficacy and inspiration, which implies changing contrast effects in assimilation effects. As noted earlier in this paper, there are reasons to believe that expectations about the outcome of future comparisons, perceived control over the comparison dimension, or perceived attainability of the comparison standard (Aspinwall et al., 2002; Buunk, Collins, Taylor, Van Yperen, & Dakof, 1990; Gibbons et al., 2000; Lockwood & Kunda, 1997, 1999; Testa & Major, 1990; Ybema & Buunk, 1995) may moderate the assimilative and contrastive effects of upward comparisons on academic self-concept. In Lockwood and Kunda's (1997) research, for example, comparison to superstars resulted in assimilation among students with a malleable conception of intelligence, but resulted in contrast among those with a fixed conception of intelligence. Likewise, Gibbons et al. (2000) predicted and found that optimism (or positive illusions about the self) was particularly influential under adverse circumstances (after poor performances; for a similar argument, see Rasmussen, Wrosch, Scheier, & Carver, 2006). Whereas the pessimists (assessed as a dispositional variable) responded to their declining performances by *lowering* their absolute

comparison-level choice, the optimists maintained a relatively high comparison-level even if they had done poorly. Further integrated research might help clarify whether such individual variables also matter for both the BFLPE and the assimilative as well as contrastive relationships reported here between deliberate comparisons and academic self-concept.

This integrated approach would also be consistent with Collins' (2000) suggestion that "to understand how assimilation and contrast processes influence social comparisons as they actually occur, we probably need to do more naturalistic studies that measure individual perceptions of similarity and difference, patterns of interaction, and the objective attributes of the social environment" (p. 169). The present research makes a significant step in this meaningful direction.

## References

- Altermatt, E. R., Pomerantz, E. M., Ruble, D. N., Frey, K. S., & Greulich, F. K. (2002). Predicting changes in children's self-perceptions of academic competence: A naturalistic examination of evaluative discourse among classmates. *Developmental Psychology, 38*, 903-917.
- Aspinwall, L. G., Hill, D. L., & Leaf, S. L. (2002). Prospects, pitfalls, and plans : A proactive perspective on social comparison activity. *European Review of Social Psychology, 12*, 267-298.
- Biernat, M. (2005). *Standards and expectancies: Contrast and assimilation in judgments of self and others*. New York, NY, US: Psychology Press.
- Biernat, M., & Manis, M. (2007). Stereotypes and Shifting Standards: Assimilation and Contrast in Social Judgment, in D. A., Stapel, J., Suls (Eds.), *Assimilation and contrast in social psychology* (pp.75-97). New York, NY : Psychology Press.
- Biernat, M., Manis, M., & Nelson, T. E. (1991). Stereotypes and standards of judgment. *Journal of Personality and Social Psychology, 60*, 485-499.
- Blanton, H., Buunk, B. P., Gibbons, F. X., & Kuyper, H. (1999). When better-than-others compare upward: Choice of comparison and comparative evaluation as independent predictors of academic performance. *Journal of Personality and Social Psychology, 76*, 420-430.
- Brickman, P., & Bulman, R. J. (1977). Pleasure and pain in social comparison. In J. M. Suls & R. L. Miller (Eds.), *Social comparison processes: Theoretical and empirical perspectives* (pp. 149-186). Washington, DC: Hemisphere.

Burleson, K., Leach, C. W., & Harrington, D. M. (2005). Upward social comparison and self-concept: Inspiration and inferiority among art students in an advanced programme. *British Journal of Social Psychology, 44*, 109-123.

Buunk, B. P., Collins, R. L., Taylor, S. E., VanYperen, N. W., & Dakof, G. A. (1990). The affective consequences of social comparison : Either direction has it ups and down. *Journal of Personality and Social Psychology, 59*, 1238-1249.

Buunk, B. P., & Ybema, J. F. (1997). Social comparison and occupational stress : The identification-contrast model. In B. P. Buunk & F. X. Gibbons (Eds.), *Health, coping, and well-Being : perspectives from social comparison theory* (pp. 359-388). Mahwah, NJ : Lawrence Erlbaum.

Carpenter, J., & Kenward, M. (2007). Guidelines for handling missing data in social science research [Electronic Version], 2007. Retrieved March 10 from [www.missingdata.org.uk](http://www.missingdata.org.uk).

Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. Cambridge: Cambridge University Press.

Chanal, J. P., & Sarrazin, P. G. (2007). Big-Fish-Little-Pond Effect versus positive effect of upward comparisons in the classroom : How does one reconcile contradictory results ? *International Review of Social Psychology/Revue Internationale de Psychologie Sociale, 20*, 69-86.

Collins, R. (1996). For better or worse: The impact of upward social comparison on self-evaluations. *Psychological Bulletin, 119*, 51-69.

Collins, R. (2000). Among the better ones: Upward assimilation in social comparison. In J. Suls & L. Wheeler (Eds.), *Handbook of Social Comparison: Theory and research* (pp. 159-171). New York: Kluwer Academic / Plenum Publishers.

Dai, D. Y. (2004). How Universal Is the Big-Fish-Little-Pond Effect? *American Psychologist*, *59*, 267-268.

Dai, D. Y. & Rinn, A. N. (2008). The Big-Fish-Little-Pond-Effect: What do we know and where do we go from here? *Educational Psychology Review*, *20*, 283-317.

Davis, J. A. (1966) The campus as a frog pond: An application of the theory of relative deprivation to career decisions of college men. *The American Journal of Sociology*, *72*, 17-31.

Diener, E., & Fujita, F. (1997). Social comparisons and subjective well-being. In B. P. Buunk & F. X. Gibbons (Eds.), *Health, coping and well-being: Perspectives from social comparison theory* (pp. 329-358). Mahwah, NJ: Erlbaum.

Dijksterhuis, A., & van Knippenberg, A. (1998). The relation between perception and behavior, or how to win a game of Trivial Pursuit. *Journal of Personality and Social Psychology*, *74*, 865-877.

Dumas, F., Huguet, P., Monteil, J.-M., & Ayme, E. (2005). Context effects in the Stroop task: Knowledge of one's relative standing makes a difference. *Current Psychology Letters: Cognition, Brain, & Behavior*, *16*, 1-12.

Dumas, F., Huguet, P., Monteil, J.-M., Rastoul, C., & Nezlek, J. (2005). Social comparison in the classroom: Is there a tendency to compare upward in elementary school? *Current Research in Social Psychology*, *10*, 166-187.

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*, 117-140.

Frey, K. S., & Ruble, D. N. (1985). What children say when the teacher is not around : Conflicting goals in social comparison and performance assessment in the classroom. *Journal of Personality and Social Psychology*, *48*, 550-562.



Gibbons, F. X., Blanton, H., Gerrard, M., Buunk, B., & Eggleston, T. (2000). Does social comparison make a difference ? Optimism as a moderator of the relation between comparison level and academic performance. *Personality and Social Psychology Bulletin*, 26, 637-648.

Gibbons, F. X., Lane, D. J., Gerrard, M., Reis-Bergan, M., Lautrup, C. L., Pexa, N. A., & Blanton, H. (2002). Comparison-level preferences after performance : Is downward comparison still useful ? *Journal of Personality and Social Psychology*, 83, 865-880.

Gilbert, D. T., Giesler, R. B., & Morris, K. A. (1995). When comparisons arise. *Journal of Personality and Social Psychology*, 69, 227-236.

Goethals, G. R., & Darley, J. (1987). Social comparison theory: Self-evaluation and group life. In B. Mullen & G. R. Goethals (Eds.), *Theories of group behavior* (pp. 21-47). New-York: Springer-Verlag.

Huguet, P., Dumas, F., & Monteil, J. M. (2004). Competing for a Desired Reward in the Stroop Task : When Attentional Control is Unconscious but Effective versus Conscious but Ineffective. *Canadian Journal of Experimental Psychology*, 58, 153-167.

Huguet, P., Dumas, F., Monteil, J.-M., & Genestoux, N. (2001). Social comparison choices in the classroom: further evidence for students' upward comparison tendency and its beneficial impact on performance. *European Journal of Social Psychology*, 31, 557- 578.

Huguet, P., Galvaing, M.-P., Monteil, J.-M., Dumas, F. (1999). Social Presence Effects in the Stroop Task: Further Evidence for an Attentional View of Social Facilitation. *Journal of Personality and Social Psychology*, 77, 1011-1025.

Huguet, P. , & Kuyper, H. (2008). Applying social psychology to the classroom. In

L. Steg, B. Buunk, B., & T. Rothengatter (Eds.), *Applied Social Psychology : Understanding and Managing Social Problems* (pp. 162-183). Cambridge: Cambridge University Press.

Huguet, P., Monteil, J.-M., & Dumas, F. (2004). The Social Regulation of Cognition: From Color-Identification in the Stroop Task to Academic Performances. In J. van der Linden & P. Renshaw (Eds.), *Social Learning: A Theoretical Shift in Perspectives to Learning and Instruction* (pp. 217-222). Londres: Kluwer.

Johnson, C. S., & Stapel, D. A. (2007). No pain, no gain: The conditions under which upward comparisons lead to better performance. *Journal of Personality and Social Psychology*, *92*, 1051-1067.

Krull, J. L., MacKinnon, D. P. (1999). Multilevel mediation modeling in group-based intervention studies. *Evaluation Review*, *23*, 418-444.

Krull, J. L., MacKinnon, D. P. (2001) Multilevel Modeling of Individual and Group Level Mediated Effects. *Multivariate Behavioral Research*, *36*, 249-277.

Lemaine, G. (1974). Social differentiation and social originality. *European Journal of Social Psychology*, *4*, 17-52.

Levine, J. M. (1983). Social comparison and education. In J. M. Levine., & M. C. Wang (Eds.), *Teacher and student perceptions: Implications for learning* (pp. 132-156). Hillsdale, NJ: Erlbaum.

Lockwood, P., & Kunda, Z. (1997). Superstars and me: Predicting the impact of role models on the self. *Journal of Personality and Social Psychology*, *73*, 91-103.

MacKinnon, D. P., Krull, J. L., & Lockwood, C. M. (2000). Equivalence of the mediation, confounding and suppression effect. *Prevention Science*, *1*, 173-181.

Major, B. (1994). From social inequality to personal entitlement: The role of social comparisons, legitimacy appraisals, and group membership. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 26, pp. 293-355). San Diego, C.A.: Academic Press.

Major, B., & Forcey, B. (1985). Social comparisons and pay evaluations: Preferences for same-sex and same job wage comparisons. *Journal of Experimental Social Psychology, 21*, 393-405.

Major, B., Testa, M., & Blysm, H. (1991). Responses to upward and downward social comparison: The impact of esteem-relevance and perceived control. In J. Suls and T. A. Wills (Eds), *Social comparison: Contemporary theory and research* (pp. 237-257). Hillsdale, NJ: Erlbaum.

Marsh, H. W. (1987). The big-fish-little-pond effect on academic self-concept. *Journal of Educational Psychology, 79*, 280-295.

Marsh, H. W. (1990a). Causal ordering of academic self-concept and academic achievement : A multiwave, longitudinal panel analysis. *Journal of Educational Psychology, 82*, 646-656.

Marsh, H. W. (1990b). The structure of academic self-concept : The Marsh-Shavelson model. *Journal of Educational Psychology, 82*, 623-636.

Marsh, H. W. (1991). Failure of high ability schools to deliver academic benefits commensurate with their students' ability levels. *American Educational Research Journal, 28*, 445-480.

Marsh, H. W. (2005). Big-Fish-Little-Pond effect on academic self-concept: A reply to responses. *German Journal of Educational Psychology, 19*, 141-144.

Marsh, H. W. & Craven, R. (2002). The pivotal role of frames of reference in

academic self-concept formation: The Big Fish Little Pond effect. In F. Pajares & T. Urda (Eds.), *Adolescence and Education* (pp. 83-123). Greenwich, CT: Information Age.

Marsh, H. W., & Hau, K. (2003). Big-fish-little-pond-effect on academic self-concept. A cross-cultural (26 country) test of the negative effects of academically selective schools. *American Psychologist*, *58*, 364-376.

Marsh, H. W., Hau, K., & Craven, R. (2004). The big-fish-little-pond effect stands up to scrutiny. *American Psychologist*, *59*, 269-271.

Marsh, H.W., Köller, O., & Baumert, J. (2001). Reunification of East and West German school systems: Longitudinal multilevel modeling study of the big-fish-little-pond-effect on academic self-concept. *American Educational Research Journal*, *38*, 321-350.

Marsh, H.W., Kong, C.K., Hau, K. (2000). Longitudinal multilevel models of the big-fish-little-pond-effect on academic self-concept: Counterbalancing contrast and reflected glory effects in Hong Kong schools. *Journal of Personality and Social Psychology*, *78*, 337-349.

Marsh, H. W., & Parker, J. W. (1984). Determinants of student self-concept: Is it better to be a relatively large fish in a small pond even if you don't learn to swim as well? *Journal of Personality and Social Psychology*, *47*, 213-231.

Marsh, H. W., Seaton, M., Trautwein, U., Lüdtke, O., Hau, K. T., O'Mara, A. J., & Craven, R. G. (2008a). The big-fish-little-pond effect stands up to critical scrutiny: Implications for theory, methodology, and future research. *Educational Psychology Review*, *20*, 319-350.

Marsh, H. W., Tracey, D. K., & Craven, R. G. (2006). Multidimensional Self-

Concept Structure for Preadolescents With Mild Intellectual Disabilities: A Hybrid Multigroup-MIMC Approach to Factorial Invariance and Latent Mean Differences. *Educational and Psychological Measurement*, 66, 795-818.

Marsh, H. W., Trautwein, U., Ludtke, O., & Köller, O. (2008b). Social comparison and big-fish-little-pond-effects on self-concept and other self-belief constructs: The role of generalized and specific others. *Journal of Educational Psychology*, 100, 510-524.

Marsh, H. W., Walker, R., & Debus, R. (1991). Subject-specific components of academic self-concept and self-efficacy. *Contemporary Educational Psychology*, 16, 331-345.

Marsh, H. W., & Yeung, A. S. (1997). Causal effects of academic self-concept on academic achievement: Structural equation models of longitudinal data. *Journal of Educational Psychology*, 89, 41-54.

Miller, C. T. (1984). Self-schemas, gender, and social comparison: A clarification of the related attributes hypothesis. *Journal of Personality and Social Psychology*, 46, 1222-1229.

Monteil, J.-M., & Huguet, P. (1999). *Social context and cognitive performance: Towards a social psychology of cognition*. Hove, East Sussex: Psychology Press.

Muller, D., Atzeni, T., & Butera, F. (2004). Coaction and upward social comparison reduce the illusory conjunction effect: Support for distraction-conflict theory. *Journal of Experimental Social Psychology*, 40, 659-665.

Mussweiler, T. (2003a). 'Everything is relative': Comparison processes in social judgment (The 2002 J. Jaspars Lecture). *European Journal of Social Psychology*, 33, 719-734.

Mussweiler, T. (2003b). Comparison processes in social judgment: Mechanisms and consequences. *Psychological Review*, *110*, 472-489.

Mussweiler, T., & Bodenhausen, G. V. (2002). I know you are, but what am I? Self-evaluative consequences of judging in-group and out-group members. *Journal of Personality and Social Psychology*, *82*, 19-32.

Mussweiler, T., Rüter, K., & Epstude, K. (2004). The ups and downs of social comparison: Mechanisms of assimilation and contrast. *Journal of Personality and Social Psychology*, *87*, 832-844.

Mussweiler, T., & Strack, F. (2000a). Consequences of social comparison : Selective accessibility, assimilation, and contrast. In J. Suls, & L. Wheeler (Eds.), *Handbook of social comparison : Theory and research* (pp. 123-141). New York : Kluwer Academic/Plenum Publishers.

Mussweiler, T., & Strack, F. (2000b). The « relative self » : Informational and judgmental consequences of comparative self-evaluation. *Journal of Personality and Social Psychology*, *79*, 23-38.

Nezlek, J. B. (2001). Multilevel random coefficient analyses of event and interval contingent data in social and personality psychology research. *Personality and Social Psychology Bulletin*, *27*, 771-785.

Nezlek, J. B., & Plesko, R. M. (2003). Affect- and self-based models of relationships between daily events and daily well-being. *Personality and Social Psychology Bulletin*, *29*, 584-596.

Pomerantz, E. M., Ruble, D. N., & Frey, K. S. (1995). Meeting goals and confronting conflict: Children's changing perceptions of social comparison. *Child Development*, *66*, 723-738.

Rasmussen, H. N., Wroch, C., Scheier, M. F., & Carver, C. S. (2006). Self-regulation processes and health: The importance of optimism and goal adjustment. *Journal of Personality, 74*, 1721-1747.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical Linear Models: Applications and Data Analysis Methods*. Sage Publications.

Raudenbush, S., Bryk, A., Cheong, Y. F., & Congdon, R. (2004). HLM 6: *Hierarchical linear and nonlinear modeling*. Lincolnwood, IL: Scientific Software International.

Reuman, D. A. (1989). How social comparison mediates the relation between ability-grouping practices and students' achievement expectancies in mathematics. *Journal of Educational Psychology, 81*, 178-189.

Rijsman, J. B. (1974). Factors in social comparison of performance influencing actual performance. *European Journal of Social Psychology, 4*, 279-311.

Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods, 7*, 147-177.

Schwarz, N., & Bless, H. (1992). Constructing reality and its alternatives: An inclusion/exclusion model of assimilation and contrast effects in social judgments. In L. L. Martin & A. Tesser (Eds.), *The construction of social judgments* (pp. 217-245). Hillsdale, NJ: Lawrence Erlbaum Associate.

Seaton, M. (2007). The big-fish-little-pond effect under the grill: Tests of its universality, a search for moderators, and the role of social comparison. Unpublished Doctoral Dissertation, University of Western Sydney.

Seaton, M., Marsh, H. W., Dumas, F., Huguet, P., Monteil, J.-M., Régner, I., Blanton, H., Buunk, B. P., Gibbons, F. X., Kuyper, H., Wheeler, L., & Suls, J. (2008).

In search of the big-fish: Investigating the coexistence of the Big-Fish-Little-Pond effect with the positive effects of upward comparison. *British Journal of Social Psychology*, 47, 73-33.

Seta, J. J. (1982). The impact of comparison processes on coactors' task performance. *Journal of Personality and Social Psychology*, 42, 281-291.

Seta, J. J., Seta, C. E., & Donaldson, S. (1991). The impact of comparison processes on coactors' frustration and willingness to expend effort. *Personality and Social Psychology Bulletin*, 17, 560-568.

Simmons, R. A. (1987). Social transition and adolescent development. *New directions for child development*, 37, 33-61.

Stapel, D. A. (2007). In the mind of the beholder : The Interpretation Comparison model of accessibility effects. In D. Stapel & J. Suls (Eds.). *Assimilation and contrast in social psychology* (pp. 143-164). Philadelphia : Psychology Press.

Stapel, D. A., & Koomen, W. (2000). Distinctiveness of others, mutability of selves: Their impact on self-evaluations. *Journal of Personality and Social Psychology*, 79, 1068-1087.

Stapel, D. A., & Koomen, W. (2001). The impact of interpretation versus comparison goals on knowledge accessibility effects. *Journal of Experimental Social Psychology*, 37, 134-149.

Stapel, D. A., & Suls, J. (2004). Method matters : Effects of explicit versus implicit social comparisons on activation, behavior, and self-views. *Journal of Personality and Social Psychology*, 87, 860-875.



Stouffer, S. A., Suchman, E. A., DeVinney, L. C., Star, S. A., & Williams, R. M., Jr. (1949). *The American Soldier: Adjustment during Army Life*. Princeton, N.J.: Princeton University Press.

Suls, J., & Wheeler, L. (2000) (Eds.). *Handbook of social comparison: Theory and research*. New-York: Kluwer Academic press.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston: Pearson Education, Inc.

Taylor, S. E., & Lobel, M. L. (1989). Social comparison activity under threat: Downward evaluation and upward contacts. *Psychological Review*, *96*, 569-575.

Testa, M., & Major, B. (1990). The impact of social comparisons after failure : The moderating effects of perceived control. *Basic and Applied Social Psychology*, *11*, 205-218.

Tracey, D. K., Marsh, H. W. & Craven, R. G. (2003). Self-Concepts of Preadolescent Students with Mild Intellectual Disabilities: Issues of Measurement and Educational Placement. In H. W. Marsh, R. G. Craven, & D. M. McInerney (Eds.). *International Advances in Self Research* (pp. 203-230). Greenwich, CT: Information Age.

Wheeler, L. (1966). Motivation as a determinant of upward comparison. *Journal of Experimental Social Psychology*, *2*, 27-31.

Wheeler, L. & Miyake, K. (1992). Social comparison in everyday life. *Journal of Personality and Social Psychology*, *62*, 760-773.

Wheeler, L., & Sulz, J. (2005). Social comparison and self-evaluations of competence. In A. Elliot & C. Dweck (Eds.), *Handbook of competence and motivation*. New York: Guilford Publications.

Wheeler, L., & Suls, J. (2007). Assimilation in social comparison : Can we agree on what it is ? *International Review of Social Psychology/Revue Internationale de Psychologie Sociale*, 20, 31-51.

Wills, T.A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin*, 90, 245-271.

Wood, J. V. (1989). Theory and research concerning social comparisons of personal attributes. *Psychological Bulletin*, 106, 231-248.

Wood, J. (1996). What is social comparison and how should we study it ? *Personality and Social Psychology Bulletin*, 22, 520-537.

Ybema, J. F., & Buunk, B. P. (1995). Affective responses to social comparison : A study among disabled individuals. *British Journal of Social Psychology*, 34, 279-292.

Author Note

This research was funded by grant ACI #04-5439 from the French Ministry of Higher Education to Pascal Huguet and Florence Dumas. We thank Jean-Paul de Gaudemar, Rector in charge of schools and universities in the region Provence-Alpes-Côte d'Azur, and all the school administrators, teachers, and students involved in this research for their collaboration. Correspondence should be addressed to Pascal Huguet: [pascal.huguet@univ-provence.fr](mailto:pascal.huguet@univ-provence.fr)

## Footnotes

<sup>1</sup> The reasons why choosing to compare upward might result in better performance are numerous. For example, observing another person who masters a task can reveal useful information on how to improve (e.g., Buunk & Ybema, 1997; Taylor & Lobel, 1989). Seeing another person succeed may also lead individuals to set higher personal standards for evaluating their own success, which can motivate efforts toward these new and more challenging goals (Seta, 1982).

<sup>2</sup> Despite reduced statistical power, the BFLPE was also found in the ‘non-choosers’ (across all ability levels), the small minority of students (somewhat around 7-8%) who opted not to nominate a comparison target (Math,  $\gamma_{01} = -.37, t = 2.68, p < .01$  ; French,  $\gamma_{01} = -.44, t = 3.30, p < .002$ ). Further analyses showed that the choosers/non-choosers distinction, defined as a Level-1 variable, did not interact with class-average ability (Math,  $\gamma_{21} = -.05, t = .55, p = .59$ ; French,  $\gamma_{21} = .03, t = .29, p = .78$ ).

<sup>3</sup> For both Math and French, 83.2 and 83.1% of the participants who indicated a comparison choice also chose a same-sex target. This preference for same-sex comparisons is consistent with both the earlier comparison choice findings (Blanton et al., 1999; Huguet et al., 2001) and other findings indicating that people often use their gender as a reference group when they self-evaluate their abilities or skills (e.g., Major, 1994; Major & Forcey, 1985; C.T. Miller, 1984).

<sup>4</sup> Also consistent with our integrative approach, controlling for the contrastive trends associated with students’ comparative evaluations against their target strengthened the assimilative trends associated with absolute comparison-level choice (Math,  $\gamma_{30} = .29, t = 10.08, p < .001$ ; French,  $\gamma_{30} = .26, t = 7.38, p < .001$ ). We also

tested the relationship between perceived similarity with and comparative evaluations against the comparison target (after controlling for students' ability and class-average ability). From a purely logical point of view, this relationship might be clearly negative: the more students feel similar to their comparison choice, the less they should feel inferior to the target when they made their comparative evaluations. According to the Selective Accessibility Model, however, when the comparison standard is used as a reference point for self-evaluation, self-other differences are made temporarily more accessible than similarities. Because differences and similarities do not belong to the same continuum, they should be mostly unrelated. In fact, the relationships between the similarity judgments and comparative evaluations were far from being clearly negative. Consistent with the Selective Accessibility Model, these relationships were weak and not systematically significant (Math,  $\gamma_{20} = -.02$ ,  $t = .83$ ,  $p = .41$ ; French,  $\gamma_{20} = -.04$ ,  $t = 2.04$ ,  $p < .05$ ). Furthermore, as revealed by a cross-level interaction with class-average ability (Math,  $\gamma_{21} = .09$ ,  $t = 2.41$ ,  $p < .05$ ; French,  $\gamma_{21} = .07$ ,  $t = 2.26$ ,  $p < .05$ ), they were mainly due to students in the low ability classes. Put differently, in the high ability classes, students' similarity judgments (with) and comparative evaluations against the comparison target were unrelated, exactly as one would expect from the Selective Accessibility Model.

<sup>5</sup> Other authors (Burleson, Leach, & Harrington, 2005; Chanal & Sarrazin, 2007) found upward assimilation effects related to comparison-level choice (for Artistic self-concept and Physical Education self-concept) and suggested that these effects can coexist with the BFLPE. However, as noted by these authors themselves, the BFLPE could not be precisely estimated in their research. Whereas Burleson et al.'s (2005) study was not specifically designed to test for the BFLPE, Chanal and Sarrazin's (2007)

study lacked a common and reliable metric for comparing students' level from different classes or schools.

<sup>6</sup> More generally, the upward assimilation findings reinforce the idea that the discovery or acknowledgment that another's achievements surpass one's own may not necessarily be painful or negative. As shown in numerous experiments (e.g., Dijksterhuis & van Knippenberg, 1998; Huguet, Galvaing, Monteil, & Dumas, 1999 ; Huguet, Dumas, & Monteil, 2004 ; Dumas, Huguet, Monteil, & Ayme, 2005; Muller, Atzeni, & Butera, 2004; Rijsman, 1974 ; Seta, 1982 ; Seta, Seta, & Donaldson, 1991), the imposed (real or imaginary) presence of relatively more successful comparison others generally improves performance (compared with when participants work alone or in presence of inferior comparison others), provided the performance differential is not too large. In some instances, even extreme comparisons can have positive effects when self-evaluation is threatened (Johnson & Stapel, 2007; Lemaine, 1974), provided the focal task is not the one where the individuals have been outperformed. Comparison with superstars can also lead to positive outcomes when individuals have the time and can hope and strive to match the more successful others (e.g., Aspinwall et al., 2002 ; Lockwood & Kunda, 1997). When these conditions are not met, the impact of upward comparisons on both self-evaluation and performance is typically negative (Johnson & Stapel, 2007 ; Rijsman, 1974 ; Seta et al., 1991), as one would also expect from theory and research on the BFLPE.

<sup>7</sup> In a series of studies focusing on comparison choice and performance, Gibbons et al. (2000, 2002) made a similar distinction between absolute and relative comparison-level. Absolute comparison-level choice was based only on the performance of the comparison target (as was our absolute comparison-level choice measure), and had

therefore no direct reference to self-performance. An example of this would be:

“Suppose you just got an exam score back, with whom would you be most interested in comparing your score?,” followed by a scale from *someone who did poorly* to *someone who got the highest grade*. For the relative comparison-level choice measure, Gibbons et al. (2000) replaced these labels by *someone whose score was much lower, about the same as, or much higher than yours* (as we did with our own relative measure making self-evaluation highly salient). For both measures, however, comparison choices were hypothetical; participants had to imagine a scenario and then indicated how they thought they might respond. As suggested by Gibbons et al. (2000) themselves, such perceptions may not have been an accurate reflection of actual comparison habits in the classroom. This potential bias was eliminated in the present research where participants had to nominate their usual comparison targets and where targets' standardized tests (as well as grades) were used to determine absolute comparison-level choice.

Table 1. The BFLPE for Math and French Self-Concept in the Base Model.

Fixed Effects	Math		French	
	B	t	B	t
Intercept	.00	0.04	-.05	1.34
SA	.67***	20.39	.50***	14.85
CAA	-.47***	6.90	-.45***	8.66
SA x CAA	.13**	2.66	.22***	4.56

Note. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

SA : Student Ability; CAA : Class-Average Ability.



Table 2. The BFLPE for Math and French Self-Concept while Controlling for Students' Perceived Relative Standing in Class.

Fixed Effects	Math		French	
	B	t	B	t
Intercept	.01	0.41	.01	0.38
SA	.25***	8.88	.09**	3.24
CAA	-.07	1.31	-.05	1.09
SA x CAA	.05	1.34	.03	0.80
PRS	-.60***	27.13	-.69***	34.34
PRS x CAA	.02	0.61	-.07*	2.36
PRS x SA	.01	0.23	.01	0.31
PRS x SA x CAA	.12***	3.38	-.06†	1.91

Note. †  $p \leq .06$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

SA : Student Ability; CAA : Class-Average Ability; PRS : Perceived Relative Standing in class.

Table 3. The BFLPE for Math and French Self-Concept while Controlling for Students' Absolute Comparison-Level Choice.

Fixed Effects	Math		French	
	B	t	B	t
Intercept	.04	1.00	-.03	0.72
SA	.65***	18.25	.49***	14.65
CAA	-.55***	8.47	-.55***	8.63
SA x CAA	.14**	2.61	.22***	4.19
CC	.09***	3.65	.09**	3.09
CC x CAA	-.03	0.74	.01	0.19
CC x SA	.10**	2.96	.09*	2.12
CC x SA x CAA	-.07	1.23	.03	0.56

Note. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

SA : Student Ability; CAA : Class-Average Ability; CC : Comparison Choice.

The CC x SA within-level interaction indicates that the relationship between ability of comparison choice and academic self-concept in Math and French was stronger for students high in ability than for their low-ability counterparts.

Table 4. The BFLPE for Math and French Self-Concept while Controlling for Students' Comparative Evaluation with Comparison Choice.

Fixed Effects	Math		French	
	B	t	B	t
Intercept	.02	0.59	-.03	0.70
SA	.59***	16.28	.45***	12.44
CAA	-.39***	5.30	-.38***	7.01
SA x CAA	.12*	2.35	.20***	3.72
CECC	-.26***	13.70	-.29***	12.63
CECC x CAA	.01	0.42	.04	1.26
CECC x SA	.01	0.51	-.01	0.51
CECC x SA x CAA	.02	0.47	.04	1.15

Note. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

SA : Student Ability; CAA : Class-Average Ability;

CECC : Comparative Evaluation with Comparison Choice.

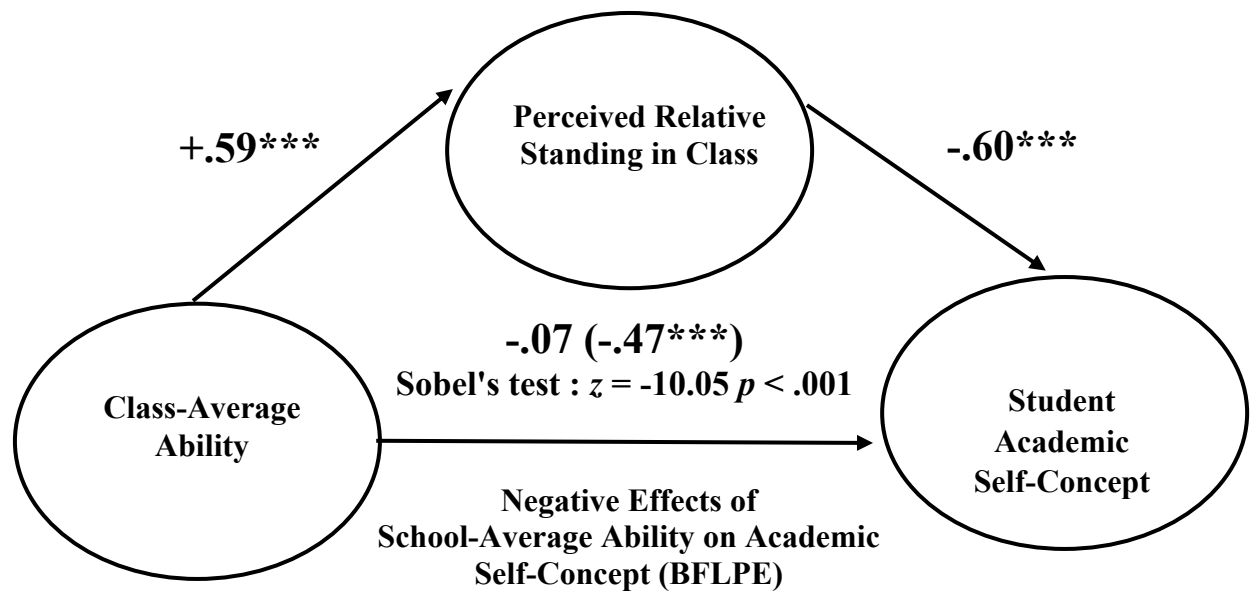


Figure 1a. The BFLPE for Math Self-Concept after Controlling for Students' Perceived Relative Standing in Class (1 = *much better than most classmates*, 3 = *the same*, 5 = *much worse*). The number in parentheses indicates the direct effect of Class-Average Ability on Student Academic Self-Concept prior to controlling for Students' Perceived Relative Standing in Class.

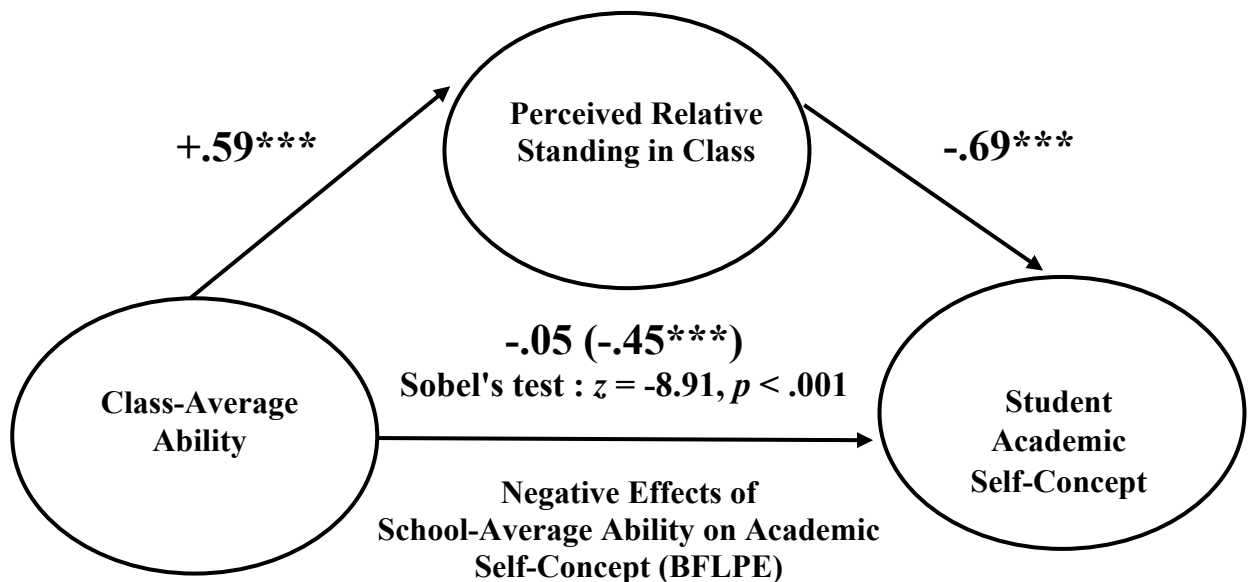


Figure 1b. The BFLPE for French Self-Concept after Controlling for Students' Perceived Relative Standing in Class (1 = *much better than most classmates*, 3 = *the same*, 5 = *much worse*). The number in parentheses indicates the direct effect of Class-Average Ability on Student Academic Self-Concept prior to controlling for Students' Perceived Relative Standing in Class.

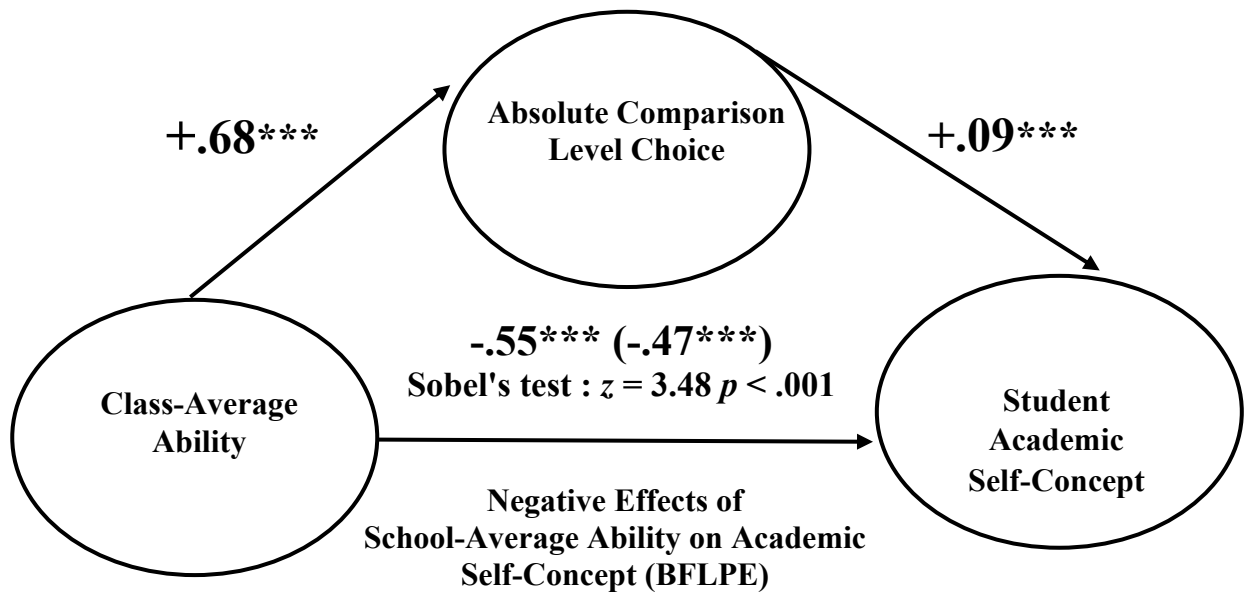


Figure 2a. The BFLPE for Math Self-Concept after Controlling for Absolute Comparison-Level Choice. The number in parentheses indicates the direct effect of Class-Average Ability on Student Academic Self-Concept prior to controlling for Comparison-Level Choice.

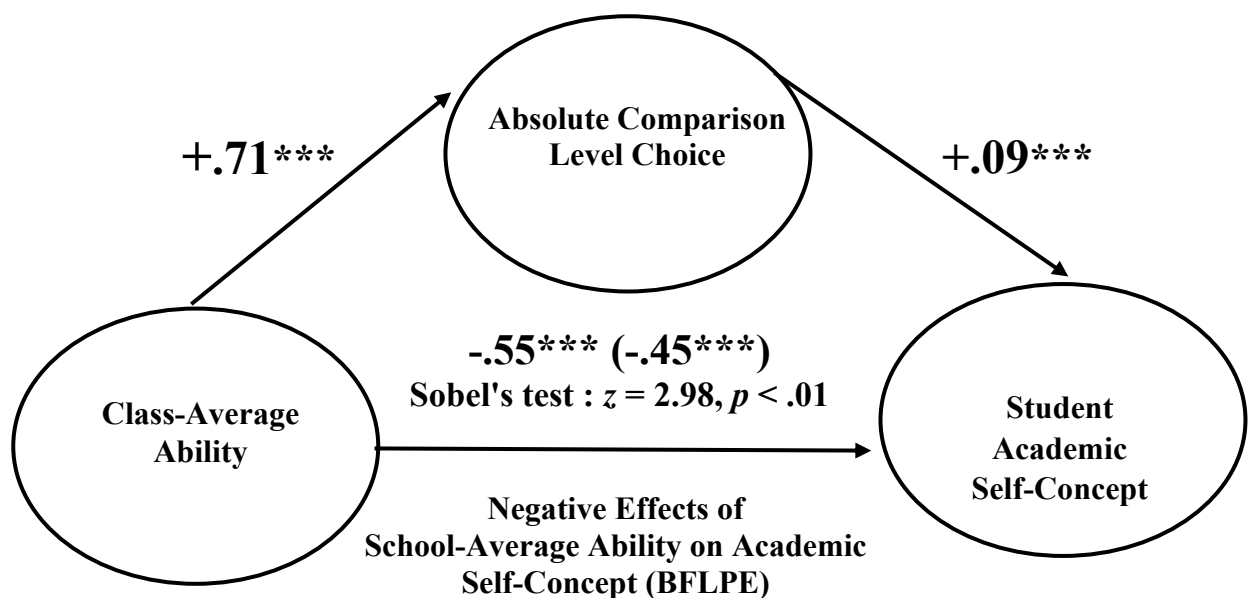


Figure 2b. The BFLPE for French Self-Concept after Controlling for Absolute Comparison-Level Choice. The number in parentheses indicates the direct effect of Class-Average Ability on Student Academic Self-Concept prior to controlling for Comparison-Level Choice.

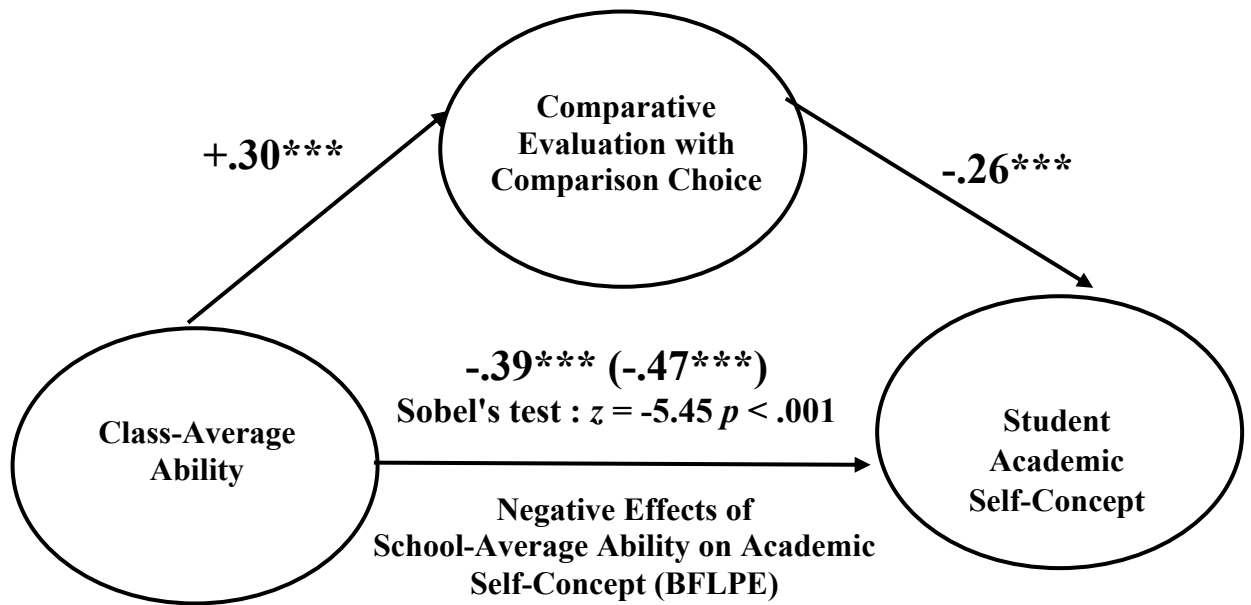


Figure 3a. The BFLPE for Math Self-Concept after Controlling for Students' Comparative Evaluation with Comparison Choice (1 = much better than comparison choice; 3 = the same; 5 = much worse). The number in parentheses indicates the direct effect of Class-Average Ability on Student Academic Self-Concept prior to controlling for Students' Comparative Evaluation with Comparison Choice.

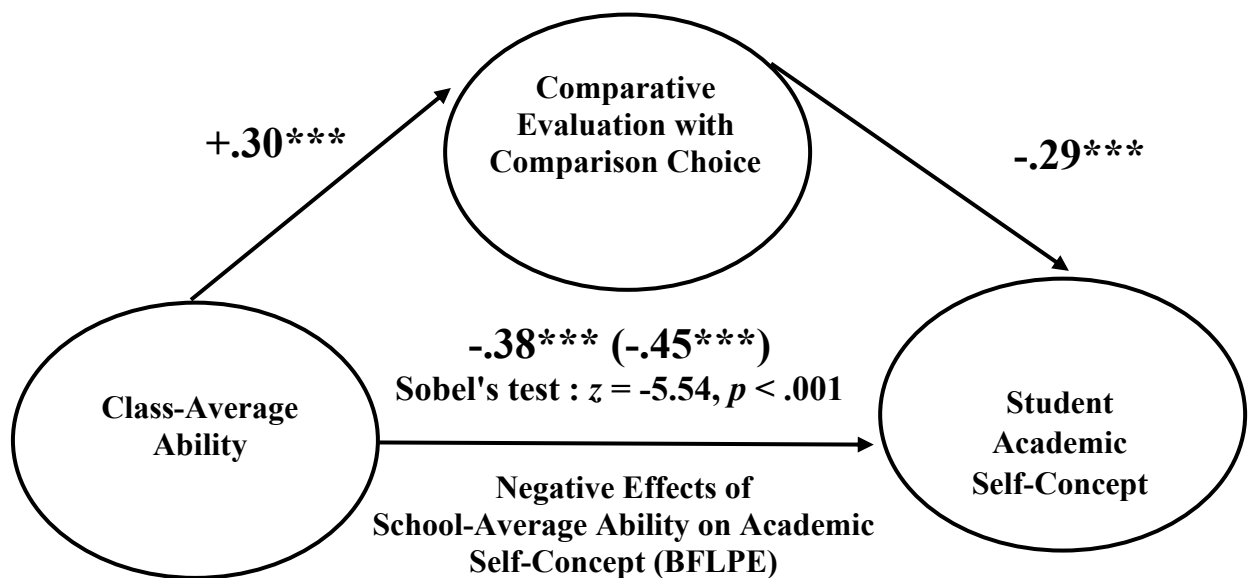


Figure 3b. The BFLPE for French Self-Concept after Controlling for Students' Comparative Evaluation with Comparison Choice (1 = much better than comparison choice; 3 = the same; 5 = much worse). The number in parentheses indicates the direct effect of Class-Average Ability on Student Academic Self-Concept prior to controlling for Students' Comparative Evaluation with Comparison Choice.