

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

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It has been speculated that the big-fish–little-pond effect (BFLPE; the negative impact of 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 (a) is eliminated after controlling for students' invidious comparisons with their class and (b) coexists with the assimilative and contrastive effects of upward social comparison choices on academic self-concept. These results increase 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.

Keywords: big-fish–little-pond effect, social comparison, academic self-concept

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, 1997). Davis (1966) was the first to demonstrate that a high school graduate at any given level of scholastic aptitude achieved a lower grade point average 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.

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Going further than Davis (1966), Marsh and colleagues have shown for more than 20 years that students with the same ability (as measured by standardized tests) typically have lower academic self-concepts 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, et al., 2008; 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 characterizes 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, Lüdtke, & Köller, 2008; 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 less successful students with whom to make favorable comparisons and a 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 those of 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 (e.g., Marsh & Hau, 2003; Marsh et al., 2008).

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) is often read aloud by the teacher or posted on a bulletin board so that each student knows exactly how he or she stands relative to his or 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 coexist with the BFLPE, the authors collaborated (Seaton et al., 2008) in a secondary analysis of the comparison choice data studies (Blanton et al., 1999; Huguet 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, Huguet, Monteil, Rastoul, & Nezelek, 2005). Upward comparison choices were dominant and were associated with higher (Time [T] 2) 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 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, Trautwein, et al. (2008) 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, Trautwein, et al. (2008) 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; Huguët 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. measured comparison choices that were hypothetical (participants had to imagine a scenario and then indicate 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, Trautwein, et al. (2008) did not include an absolute comparison-level choice measure, whereas Blanton et al. (1999) and Huguët et al. (2001) did not include a relative comparison-level choice measure (as also noted by Marsh, Seaton, et al., 2008). 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 assump-

tion that forced upward social comparison with the entire class underlies the BFLPE. If this is the case, then (a) 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); (b) the more students feel inferior to their class, the lower their academic self-concept; and more important, (c) 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., Collins, 1996; Wheeler, 1966), 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; Wheeler & Miyake, 1992; Wood, 1989, 1996), the downward trend seems less likely than the upward trend.¹ Downward comparison choices typically do not help one to self-improve (for a similar argument, see Gibbons et al., 2000, 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; Huguët et al., 2001; Seaton et al., 2008), a behavioral assimilation tendency (Dijksterhuis & van Knippenberg, 1998). If deliberate comparisons with

¹ 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).

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). On the basis of 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 did we examine this possibility, but we also measured perceived similarity with the comparison target, 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 to 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 are 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, Trautwein, et al., 2008). This comparative judgment was not integrated in the earlier comparison choice studies (Blanton et al., 1999; Huguet et al., 2001). Thus, on the basis of 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 one to predict that assimilation and contrast may result from a single comparison choice. According to the interpretation comparison model, social comparison can serve two 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 in Marsh, Trautwein, et al.’s (2008) study 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 students feel inferior to their target, the lower their academic self-concept should be.

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 2,015 students (989 girls and 1,026 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, which was described as a research study 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 (2,106 students were originally contacted). Participants had been assigned by school administrators to 1 of the 99 classrooms, with 16 to 28 students in each class and 4 to 8 classes per school. The schools represented both urban and suburban areas and different socioeconomic statuses. They were randomly selected from among other schools classified as high, medium, and low achieving on the basis of two national standardized academic achievement tests (see next section), one in Math and the other in French. There were five high-achievement schools (which were defined as those scoring 1 *SD* above the mean compared to schools located in the same geographical area), six low-achievement schools (those scoring 1 *SD* below the mean), and five medium-achievement schools (those scoring close to the mean). 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*) and class-average ability and to determine the ability of students' comparison choice (*comparison-level choice*) in the two academic domains.

Academic self-concept. A standard six-item 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's $\alpha = .88$ 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 code numbers of their comparison targets using a list where all students in their class and their respective 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 test scores were used to determine comparison-level choice in Math and French, any relationship between students' own ability and the 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 of seeing 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—that is, 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 β_{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 γ_{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 reestimated 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 (β_{1j}), class-average ability was also included as a predictor for all slopes in all analyses. We did this 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 a 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 nonidentifiable 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 *nonchoosers*), 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. We also conducted all analyses using multiple imputation of missing data, a technique based on the expectation maximization algorithm (see Schafer & Graham, 2002; Tabachnick & Fidell, 2007). This technique efficiently overcomes problems typically associated with missing data (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 ($\gamma_{10} = 0.67, t = 20.39, p < .001$) and French ($\gamma_{10} = 0.50, t = 14.85, p < .001$), there were negative relationships between class-average ability and self-concept in Math and French (Math, $\gamma_{01} = -0.47, t = 6.90, p < .001$; French, $\gamma_{01} = -0.45, t = 8.66, p < .001$; see Table 1).² This negative relationship was moderated by students’ ability in both Math ($\gamma_{11} = 0.13, t = 2.66, p < .01$) and French ($\gamma_{11} = 0.22, t = 4.56, p < .01$). 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).

² Despite reduced statistical power, the BFLPE was also found in the nonchoosers (across all ability levels), the small minority of students (somewhere around 7%–8%) who opted not to nominate a comparison target (Math, $\gamma_{01} = -0.37, t = 2.68, p < .01$; French, $\gamma_{01} = -0.44, t = 3.30, p < .002$). Further analyses showed that the choosers–nonchoosers distinction, defined as a Level 1 variable, did not interact with class-average ability (Math, $\gamma_{21} = -0.05, t = 0.55, p = .59$; French, $\gamma_{21} = 0.03, t = 0.29, p = .78$).

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

Fixed effect	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 × CAA	.13**	2.66	.22***	4.56

Note. BFLPE = big-fish–little-pond effect; SA = student ability; CAA = class-average ability.
** $p < .01$. *** $p < .001$.

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 ($\gamma_{01} = 0.59, t = 9.23, p < .0001$) and French ($\gamma_{01} = 0.59, t = 10.84, p < .0001$).

In addition, for both subjects, the more students felt inferior to their class, the lower their academic self-concept (Math, $\gamma_{20} = -0.60, t = 25.42, p < .001$; French, $\gamma_{20} = -0.69, t = 34.34, p < .001$). Above all, and consistent with our expectation, including perceived relative standing in class rendered the BFLPE nonsignificant 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).

Absolute Comparison-Level Choice

Preliminary analyses. Consistent with prior comparison choice studies (Blanton et al., 1999; Huguet et al., 2001), students

Table 2
The BFLPE for Math and French Self-Concept While Controlling for Students’ Perceived Relative Standing in Class

Fixed effect	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 × CAA	.05	1.34	.03	0.80
PRS	-.60***	27.13	-.69***	34.34
PRS × CAA	.02	0.61	-.07*	2.36
PRS × SA	.01	0.23	.01	0.31
PRS × SA × CAA	.12***	3.38	-.06†	1.91

Note. BFLPE = big-fish–little-pond effect; SA = student ability; CAA = class-average ability; PRS = perceived relative standing in class.
† $p \leq .06$. * $p < .05$. ** $p < .01$. *** $p < .001$.

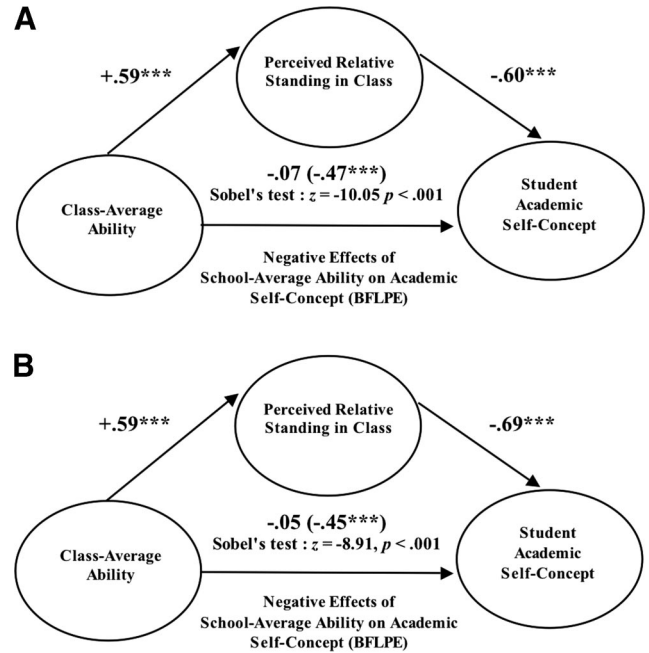


Figure 1. The big-fish–little-pond effect (BFLPE) for (A) Math self-concept and (B) French self-concept after controlling for students’ perceived relative standing in class (1 = much better than most classmates, 3 = the same, 5 = much worse). The number in parentheses indicates the direct effect of class-average ability on student academic self-concept prior to controlling for students’ perceived relative standing in class. *** $p < .001$.

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 that was significantly different from zero between ability of comparison choice and the student’s own ability (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 on ability, which 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 zero (Math, $\gamma_{00} = 0.55, t = 6.93, p < .001$; French, $\gamma_{00} = 0.49, t = 7.77, p < .001$). Thus, students chose comparisons with classmates who were somewhat more successful in Math and French, based on two indices.³ Also consistent with the previous comparison

³ For both Math and French, respectively, 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; Miller, 1984).

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 ($\gamma_{20} = 0.11, t = 5.68, p < .0001$) and French ($\gamma_{20} = 0.10, t = 5.50, p < .0001$). More important for the present article, and as expected, the higher the class-average ability, the higher the absolute comparison-level choice (based on ability or standardized test scores) in Math ($\gamma_{01} = 0.68, t = 14.32, p < .0001$) and French ($\gamma_{01} = 0.71, t = 14.30, p < .0001$), 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, there was a positive relationship between absolute comparison-level choice and academic self-concept in Math ($\gamma_{20} = 0.09, t = 3.65, p < .001$) and French ($\gamma_{20} = 0.09, t = 3.09, p < .002$), 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 ($\gamma_{20} = 0.09, t = 2.89, p < .004$) and French ($\gamma_{20} = 0.12, t = 3.56, p < .001$). 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.

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

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

Note. The CC × 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. BFLPE = big-fish-little-pond effect; SA = student ability; CAA = class-average ability; CC = comparison choice.
* $p < .05$. ** $p < .01$. *** $p < .001$.

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 -0.47 to -0.55 in Math and from -0.45 to -0.55 in French (both $ps < .001$; see Figures 2A & 2B).

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 ($\gamma_{01} = 0.30, t = 5.41, p < .0001$) and French ($\gamma_{01} = 0.30, t = 5.93, p < .0001$), 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, Trautwein, et al.'s (2008) findings, the more students felt inferior to their comparison target, the lower their academic self-concept (Math, $\gamma_{20} = -0.26, t = 13.70, p < .001$; French, $\gamma_{20} = -0.29, t = 12.63, p < .001$), 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, although the BFLPE decreased substantially (from -0.47 to -0.39 in Math, and from -0.45 to -0.38 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).⁴

Discussion

It has been speculated for some time that the BFLPE is a consequence of invidious social comparisons experienced in

⁴ 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, $\gamma_{30} = 0.29, t = 10.08, p < .001$; French, $\gamma_{30} = 0.26, t = 7.38, p < .001$). 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 clearly negative. Consistent with the selective accessibility model, these relationships were weak and not systematically significant (Math, $\gamma_{20} = -0.02, t = 0.83, p = .41$; French, $\gamma_{20} = -0.04, t = 2.04, p < .05$). Furthermore, as revealed by a cross-level interaction with class-average ability (Math, $\gamma_{21} = 0.09, t = 2.41, p < .05$; French, $\gamma_{21} = 0.07, t = 2.26, p < .05$), 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.

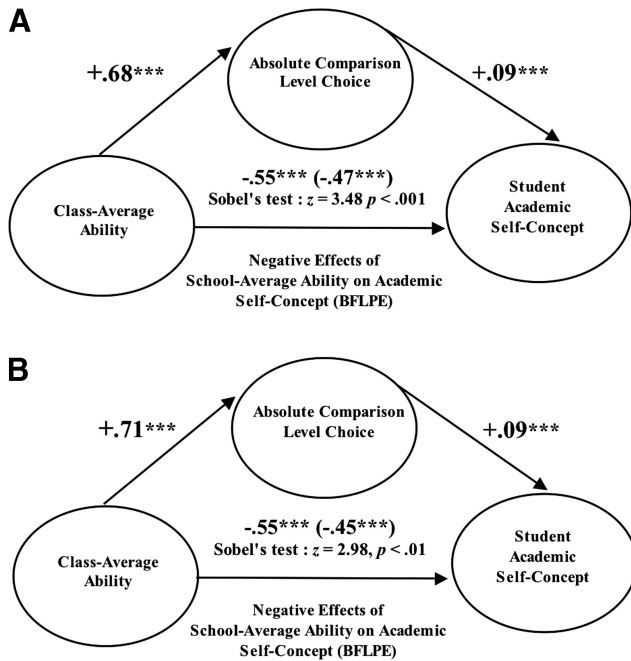


Figure 2. The big-fish–little-pond effect (BFLPE) for (A) Math self-concept and (B) French self-concept after controlling for absolute comparison-level choice. The number in parentheses indicates the direct effect of class-average ability on student academic self-concept prior to controlling for comparison-level choice. *** $p < .001$.

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 (a) is eliminated after controlling for students' invidious comparisons with their class and (b) 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.

Table 4
The BFLPE for Math and French Self-Concept While Controlling for Students' Comparative Evaluation With Comparison Choice

Fixed effect	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 × CAA	.12*	2.35	.20***	3.72
CECC	-.26***	13.70	-.29***	12.63
CECC × CAA	.01	0.42	.04	1.26
CECC × SA	.01	0.51	-.01	0.51
CECC × SA × CAA	.02	0.47	.04	1.15

Note. BFLPE = big-fish–little-pond effect; SA = student ability; CAA = class-average ability; CECC = comparative evaluation with comparison choice.
* $p < .05$. *** $p < .001$.

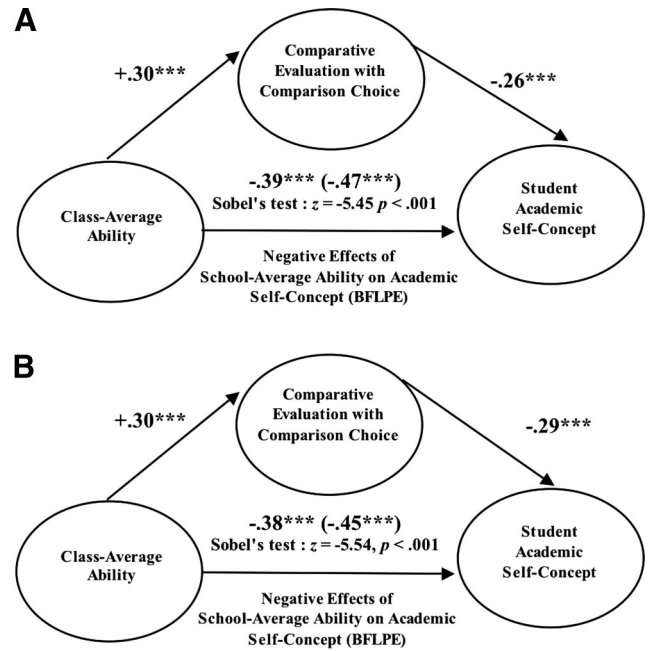


Figure 3. The big-fish–little-pond effect (BFLPE) for (A) Math self-concept and (B) French self-concept after controlling for students' comparative evaluation with comparison choice (1 = much better than comparison choice, 3 = the same, 5 = much worse). The number in parentheses indicates the direct effect of class-average ability on student academic self-concept prior to controlling for students' comparative evaluation with comparison choice. *** $p < .001$.

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 that 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 relied mainly 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), our finding was that 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 wherein 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 article, and our findings support it. 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.

On the basis of 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 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 themselves, 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).⁵

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 was higher (absolute) comparison-level choice associated with higher academic self-concept, but the higher the (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 being 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 judgments 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, 1954, would have predicted), 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 compara-

⁵ Other authors (Burlinson, 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 Burlinson 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' levels across different classes or schools.

tive 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; Huguét 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, Trautwein, et al.'s (2008) findings, contrastive rather than assimilative trends were found whenever students were asked to self-evaluate against their comparison targets. With comparison-level choice reflecting, on average, a slightly upward tendency (as Festinger, 1954, would also have predicted), 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 article, 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 is that contrast occurred only when students were forced to self-evaluate against their comparison targets, which suggests that assimilation was the "default mindset" for most of them, consistent with the selective accessibility model (Mussweiler, Rüter, & Epstude, 2004; Mussweiler & Strack, 2000a, 2000b). 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 Biernat, 2005; Suls & Wheeler, 2000). 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.⁶ 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 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.⁷ 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 article, 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 have been) 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

⁶ 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 to make 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 because participants had to nominate their usual comparison targets and targets' standardized test scores (as well as grades) were used to determine absolute comparison-level choice.

⁷ 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; Dumas, Huguét, Monteil, & Ayme, 2005; Huguét, Dumas, & Monteil, 2004; Huguét, Galvaing, Monteil, & Dumas, 1999; 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 the 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.

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, Seaton, et al., 2008). 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 socioeconomic statuses 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, Seaton, et al., 2008).

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, Seaton, et al., 2008). 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 & 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 (-0.46 in the base model for the two academic domains averaged, actually more than twice the size of that reported by Marsh & Hau, 2003, which was -0.20), 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 over more than 20 years, showing that higher ability settings produce academic outcomes that are lower than what would be expected based on the quality of students (for recent reviews, see Marsh, Seaton, et al., 2008; Seaton, 2007). 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, Seaton, et al., 2008). 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, Seaton, et al., 2008). At the very least, it seems that academically 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 for by the pride of association with 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, Seaton, 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 and more to change invidious social comparisons to the whole class into sources of efficacy and inspiration, which implies changing contrast effects into assimilation effects. As noted earlier in this article, 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 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's (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.

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