



Big-fish-little-pond social comparison and local dominance effects: Integrating new statistical models, methodology, design, theory and substantive implications

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ABSTRACT

We offer new theoretical, substantive, statistical, design, and methodological insights into the seemingly paradoxical negative effects of school- and class-average achievement (ACH) on academic self-concept (ASC)—the big-fish-little-pond-effect (BFLPE; 15,356 Dutch 9th grade students from 651 classes in 95 schools). In support of the theoretical, social-comparison basis of the BFLPE, controlling for direct measures of social comparison (subjective ranking of how students compare with other students in their own class) substantially reduces the BFLPE. Based on new (latent three-level) statistical models and theoretical predictions integrating BFLPEs and 'local dominance' effects, significantly negative BFLPEs at the school level are largely eliminated, absorbed into even larger BFLPEs at the class level. Students accurately perceive large ACH differences between different classes within their school and across different schools. However, consistent with local dominance, ASCs are largely determined by comparisons with students in their own class, not objective or subjective comparisons with other classes or schools. At the individual student level, ASC is more highly related to class marks (from report cards) than standardized test scores, but the negative BFLPE is largely a function of class-average test scores. Consistent with theoretical predictions, BFLPEs generalize across objective and subjective measures of individual ACH, and BFLPEs are similar for the brightest and weakest students.

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1. Introduction

In education settings, a positive academic self-concept (ASC) is both a highly desirable goal and a means of facilitating subsequent academic achievement (ACH), academic accomplishments, and educational choice behaviors including subject choice, coursework selection, academic persistence, and long-term educational attainment (e.g., Chen, Yeh, Hwang, & Lin, 2013; Guay, Larose, & Boivin, 2004; Marsh, 1991; Pinxten, De Fraine, Van Damme, & D'Haenens, 2010). In the formation of ASC, individuals must

juxtapose their perceived accomplishments and appropriate standards or frames of reference for evaluating their accomplishments. The same objective characteristics and accomplishments can lead to disparate ASCs, depending on the frames of reference that individuals use to evaluate themselves, and these self-beliefs have important implications for future choices, performance, and behaviors (Marsh, 2007; also see William James, 1890/1963, p. 310).

Following from this tradition, we extend research on the big-fish-little-pond-effect (BFLPE), which describes the seemingly paradoxical negative effects of school- and class-average ACH on academic self-concept (Marsh et al., 2008; Marsh & Parker, 1984). Thus, students in academically selective settings compare their own accomplishments with those of their classmates and form less positive academic self-concepts than if they were in less academically selective settings. The BFLPE has important theoretical implications for social comparison theory, important methodological

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implications for more appropriate multilevel models of contextual effects, and important policy/practice implications related to the unintended negative consequences of selective educational settings (Marsh et al., 2008). Hence, the present investigation is a substantive-methodological synergy (Marsh & Hau, 2007), an integration of new and evolving methodology to address new substantive issues with theoretical and policy implications.

Here we combine new statistical models, methodology, theoretical perspectives, study design and data to test new BFLPE predictions and contribute to the resolution of unresolved theoretical and substantive issues. Statistically, we introduce the first BFLPE application of latent three-level models (students nested within classes, classes nested within schools) that integrates the advantages of confirmatory factor analysis (CFA), structural equation models (SEM), and multilevel models. This allows us to juxtapose the separate and combined effects of class-average and school-average effects on ASC that are typically confounded. It also allows us to test new BFLPE theoretical predictions based on the integration of social comparison theory (Festinger, 1954; Marsh et al., 2008) and the local dominance effect that posits that students use the most local frame of reference even when they know that it is not representative and more appropriate normative information is available (Alicke, Zell, & Bloom, 2010; Zell & Alicke, 2009). Theoretically, we extend direct measures of social comparisons (individual student rankings of their ability in relation to their class) proposed by Huguet et al. (2009) to include direct social comparison measures of the class and school. We integrate these new and extended measures with improved statistical models to test novel theoretical predictions about how social comparison, local dominance, and grading-on-a-curve (the tendency for teachers to give a similar distribution of school marks, independent of the absolute ability level of students in their class) processes underpin the BFLPE in relation to alternative frames of reference. Combining these new approaches, we evaluate and juxtapose conflicting predictions about how the BFLPE is moderated by individual student ACH (objective and subjective) – whether the negative effects of class- and school-average ACH on ASC differ for the brightest and weakest students.

2. BFLPE: The theoretical, methodological, and substantive foci

2.1. BFLPE theoretical models and empirical support

Focusing on ASC in educational contexts, Marsh (1984; see also Marsh & Parker, 1984; Marsh et al., 2008) proposed the BFLPE to

encapsulate frame of reference effects that are based on an integration of theoretical models and empirical research from diverse disciplines. In the theoretical model underpinning the BFLPE (Fig. 1), a negative BFLPE occurs when equally able students have lower ASCs if they compare themselves with more able classmates, and higher ASCs if they compare themselves with less able classmates. ASC is positively affected by individual ACH (i.e., more able students have higher ASCs): The path from individual ACH to individual ASC is substantial and positive ($++$ in Fig. 1). However, ASC is negatively affected by school- or class-average ACH (i.e., the same student will have a lower ASC when school- or class-average ACH is high): The path from school- or class-average ACH is negative. Hence, ASC depends not only on a student's academic accomplishments but also on those of the student's classmates. Consistent with theoretical predictions and the multidimensionality of self-concept, the BFLPE in academic settings is specific to specific school subjects (e.g., mathematics, English, science). In contrast, school- and class-average ACH have little positive or negative effect on non-academic self-concepts or global self-esteem (e.g., Marsh, 1987; Marsh, Chessor, Craven, & Roche, 1995; Marsh & Parker, 1984; for a review, see Marsh et al., 2008).

Across diverse samples, ages, instruments, and designs, there is extensive empirical support for the BFLPE (Marsh et al., 2008; Nagengast & Marsh, 2012), recently popularized in Gladwell's (2013) *David and Goliath: Underdogs, Misfits, and the Art of Battling Giants*. Furthermore, the negative effects of school-average ACH are not limited to just ASC. In a large, nationally representative, longitudinal study of US high school students (Marsh, 1991), the effects of school-average ACH were negative for almost all Year 10, Year 12, and post-secondary outcomes; none of the 17 effects considered were positive and 15 were significantly negative. School-average ACH most negatively affected ASC (the BFLPE) and educational aspirations, but also negatively affected coursework selection, school grades, academic effort, standardized test scores, occupational aspirations, and subsequent university attendance. However, these negative effects of school-average ACH were substantially mediated by ASC.

2.2. Unresolved theoretical issues in BFLPE studies

2.2.1. Local dominance effects: Class vs. school social comparison processes

The juxtaposition of negative effects associated with class-average and school-average ACH has important theoretical implications for studies of the local dominance effect. Based on social psychology laboratory studies, Zell and Alicke (2009; see also Alicke et al., 2010) experimentally manipulated the frame of reference in relation to feedback given to participants about how their performances compared to others. They pitted idiosyncratic *local* against more *general* broadly representative comparison standards. Participants consistently used the most local comparison information available to them, even when they were told that the local comparison was not representative of the broader population and were provided with more appropriate normative comparison standards. Translating the local dominance effect into the present investigation, class-average ACH (a more proximal frame of reference) should have more impact on students' ASC than school-average ACH. Indeed, a complete local dominance effect would predict that there would be little or no effect of school-average ACH once the effects of class-average ACH were controlled. Because the present investigation is the first multilevel test of the BFLPE to appropriately juxtapose the effects of school and classroom effects, it provides an important extension to local dominance studies, testing the generalizability of predictions outside of laboratory settings.

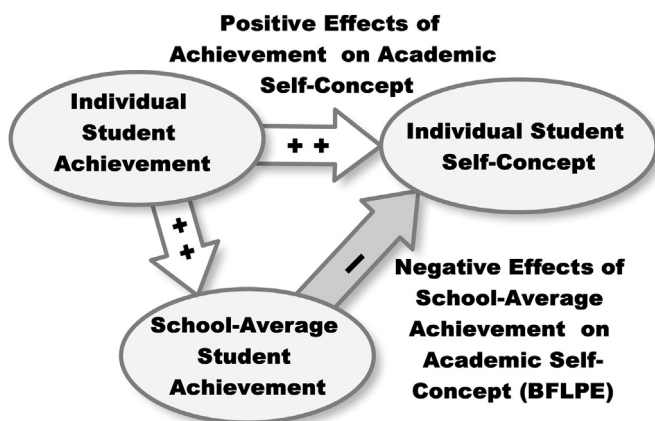


Fig. 1. The big-fish-little-pond effect.

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