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# The Social Advantage of Miscalibrated Individuals: The Relationship Between Social Class and Overconfidence and Its Implications for Class-Based Inequality

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Understanding how socioeconomic inequalities perpetuate is a central concern among social and organizational psychologists. Drawing on a collection of findings suggesting that different social class contexts have powerful effects on people's sense of self, we propose that social class shapes the beliefs that people hold about their abilities, and that this, in turn, has important implications for how status hierarchies perpetuate. We first hypothesize that compared with individuals with relatively low social class, individuals with relatively high social class are more overconfident. Then, drawing on research suggesting that overconfidence can confer social advantages, we further hypothesize that the overconfidence of higher class individuals can help perpetuate the existing class hierarchy: It can provide them a path to social advantage by making them appear more competent in the eyes of others. We test these ideas in four large studies with a combined sample of 152,661 individuals. Study 1, a large field study featuring small-business owners from Mexico, found evidence that individuals with relatively high social class are more overconfident compared with their lower-class counterparts. Study 2, a multiwave study in the United States, replicated this result and further shed light on the underlying mechanism: Individuals with relatively high (vs. low) social class tend to be more overconfident because they have a stronger desire to achieve high social rank. Study 3 replicated these findings in a high-powered, preregistered study and found that individuals with relatively high social class were more overconfident, even in a task in which they had no performance advantages. Study 4, a multiphase study that featured a mock job interview in the laboratory, found that compared with their lower-class counterparts, higher-class individuals were more overconfident; overconfidence, in turn, made them appear more competent and more likely to attain social rank.

*Keywords:* social class, inequality, overconfidence, overplacement, hierarchies

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Advantages beget advantages. Those who are born in the upper-class echelons are likely to remain in the upper class (Wilkinson & Pickett, 2009). The majority of individuals who work at elite and prestigious firms tend to come from elite educational institutions (Rivera, 2016). And high-earning entrepreneurs disproportionately originate from highly educated and well-to-do families (Levine & Rubinstein, 2013). These are some examples of how advantage tends to be self-perpetuating, belying the American ideal of social mobility (e.g., Hochschild, 1996).

Understanding how socioeconomic inequalities perpetuate is a central concern among social and organizational psychologists. Many scholars have suggested that social inequalities persist because of systemic prejudice that make it difficult for those at the bottom to improve their standing (Belmi, Barragan, Neale, & Cohen, 2015; Bielby & Baron, 1986; Kang, DeCelles, Tilcsik, & Jun, 2016; Laurin, Fitzsimons, & Kay, 2011; Moss & Tilly, 2003; Pager, Western, & Bonikowski, 2009; Rivera, 2016). Other scholars have suggested that structural inequalities may be hard to dismantle because those who wield the most influence are motivated to preserve their advantages (e.g., Kraus & Keltner, 2013; Phillips & Lowery, 2018). And other scholars have suggested that inequality may perpetuate when mainstream institutions do not acknowledge the values and norms of individuals from underrepresented groups (Belmi & Laurin, 2016; Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012; Stephens, Markus, &

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Phillips, 2014). All these explanations play an important role in perpetuating social inequality.

In this article, we propose a previously unexplored mechanism that may help further illuminate how class hierarchies perpetuate. Drawing on social-psychological research suggesting that different social class contexts have powerful effects on people's sense of self (Belmi & Laurin, 2016; Côté, 2011; Dubois, Rucker, & Galinsky, 2015; Fiske & Markus, 2012; Kraus, Piff, & Keltner, 2009; Markus & Kitayama, 2010; Stephens, Markus, et al., 2014), we propose that social class shapes the attitudes that people hold about their abilities, and that this, in turn, has important implications for how class hierarchies perpetuate. Specifically, we first hypothesize that individuals with relatively high social class are more overconfident compared with individuals with relatively low social class. Then, drawing on recent research suggesting that overconfidence can confer social advantages (Anderson, Brion, Moore, & Kennedy, 2012), we further hypothesize that the overconfidence of individuals with relatively high social class can help perpetuate the existing class hierarchy: Their overconfidence can help them maintain their social advantage by making them appear competent in the eyes of others.

## Prior Research on Social Class and Self-Views

Social class is a multidimensional construct that encompasses people's objective resources (i.e., income, education, parental education) as well as their subjective assessments of their standing in society (e.g., subjective rank; Adler, Epel, Castellazzo, & Ickovics, 2000; Kraus et al., 2009). An extensive body of work has examined the link between social class and positivity of self-views—the extent to which people see themselves in a positive light (Humberg et al., 2018). This body of work has generally found that individuals with relatively high social class tend to see themselves in a more favorable light compared with their lower-class counterparts. For example, scholars have found that individuals with relatively high social class tend to score higher on measures of self-esteem (e.g., Judge & Hurst, 2007; Kraus & Park, 2014) and narcissism (Martin, Côté, & Woodruff, 2016; Piff, 2014) compared with individuals with relatively low social class. Others have found that those with relatively high social class are more inclined to think that they have power (Dubois et al., 2015) and control over their situations (Kraus et al., 2009), compared with individuals with relatively low social class. And Varnum (2015) also found some evidence that compared with their lower-class counterparts, individuals with relatively high social class have a stronger tendency to think of themselves as better than the average.

Although copious research documents a link between social class and positivity of self-views, past studies have not sufficiently examined whether individuals with relatively high social class are more overconfident compared with their lower-class counterparts. *Overconfidence* captures the extent to which people hold inaccurate and overly positive perceptions of themselves, beyond what reality can justify (Moore & Healy, 2008). To our knowledge, most past studies on social class and positivity of self-views do not incorporate an accuracy benchmark against which people's beliefs can be compared. Because claims about overconfidence necessitate a comparison between beliefs and reality (Moore & Schatz, 2017), previous studies cannot directly answer whether social class is linked to overconfidence.

## Overconfidence

Moore and Schatz (2017) outlined at least three different ways in which people can exhibit overconfidence. First, they can demonstrate *overestimation*, or the tendency to think of themselves as better than they actually are, relative to an objective operational standard (Buehler, Griffin, & Ross, 1994; Krueger & Wright, 2011). An example of overestimation would be a student taking a 20-item test and believing that he got all of them correct, when in fact, he only answered 10 of the questions correctly. Second, they can demonstrate *overplacement*, or having the exaggerated belief that they are better than others (Krueger & Mueller, 2002; Kruger & Dunning, 1999; Larrick, Burson, & Soll, 2007). An example of overplacement would be the same student thinking that he ranks at the top percentile of his class, when in reality, he is just in the middle of the distribution. Third, they can demonstrate *overprecision*, or having an excessive faith in knowing the truth (e.g., Fast, Sivanathan, Mayer, & Galinsky, 2012). An example of overprecision would be a student saying that he is 99% sure that fortune cookies are a Chinese tradition (when in fact he is wrong, because fortune cookies were invented in the United States).

To our knowledge, we know of only one study that has found direct evidence of a positive relationship between social class and overconfidence. Bhandari and Deaves (2006) analyzed a dataset that consisted of pension plan owners in Canada, who as part of a larger survey, had to answer questions that tested their knowledge of financial investment. Specifically, these respondents were asked two questions on financial investment; then, they reported how confident they were in their answers on those two questions. Bhandari and Deaves (2006) found that education and income positively predicted *overprecision*: More educated and higher-earning respondents in that survey expressed more certainty in their answers compared with their less-educated and lower-income counterparts.

However, it is important to note that the study conducted by Bhandari and Deaves (2006, p. 6) was "an exploratory demographic analysis of overconfidence" and does not offer a psychological theory as to why upper-class individuals showed higher levels of overconfidence relative to their lower-class counterparts. Furthermore, they did not systematically assess the underlying processes that might account for this relationship. In this article, we developed and tested a theoretical model that integrates several distinct psychological literatures to explain why higher-class individuals tend to be more overconfident compared with their lower-class counterparts. Specifically, we integrate perspectives on cultural mismatch theory (Stephens et al., 2012; Stephens et al., 2014), research on power and social rank motives (Belmi & Laurin, 2016), and research on status conferral (e.g., Anderson, Brion, et al., 2012) to illuminate why individuals with relatively high social class tend to be more overconfident compared with their lower-class counterparts. Then, we test the potential implications of this relation-

ship for the understanding of how class-based hierarchies reproduce.

## How High (Versus Low) Class Contexts Shape Overconfidence

### Cultural Mismatch Theory

Cultural mismatch theory (Stephens et al., 2012, 2014) suggests that social class contexts provide an important source of variation in people's understanding of what it means to be a good or appropriate person in the world (Cross & Madson, 1997; Markus & Kitayama, 1991, 2010). Middle-class contexts are characterized by abundant resources, low material constraint, and a wide array of opportunities to exercise choice and control (Kraus, Piff, Mendoza-Denton, Rheinschmidt, & Keltner, 2012; Stephens et al., 2014; Stephens, Markus, & Townsend, 2007); as a result, these environments tend to promote and support an *independent model of the self*: one that defines a normatively appropriate person as agentic, distinct from others, and focused primarily on one's personal motives, goals, and preferences (Markus & Kitayama, 2003). By contrast, working-class contexts are characterized by limited resources, high material constraints, and fewer opportunities to exercise choice and control (Chen & Miller, 2013; Kohn, 1969; Lachman & Weaver, 1998; Reay, Davies, David, & Ball, 2001; Stephens et al., 2014); as a result, these environments tend to promote and support an *interdependent model of the self*: One that defines a normatively appropriate person as somebody who adjusts to the conditions of the context, sees themselves as connected to others, and responds to their needs, preferences, and interests.

Prior research on cultural mismatch theory aligns with our hypothesis that overconfidence is more prevalent among individuals with relatively high social class. For example, Stephens, Dittman, and Townsend (2017) noted that in middle-class contexts, individuals are socialized to differentiate themselves from others, to express what they think and feel, and to confidently express their ideas and opinions. Professional schools and workplaces, which are also predominantly guided by middle-class norms (Stephens et al., 2017), also teach and encourage individuals to *project confidence, even when they lack accurate knowledge*. For example, some leaders give the advice that to get ahead in the workplace, employees should be "shameless," in that they should project an air of confidence, "regardless of whether or not they should be in charge" (White, 2014, para. 2).

In contrast, working-class contexts tend to emphasize the value of being appropriately confident. In such contexts, for example, individuals often hear the message that "it's not just about you" (cf. Miller, Cho, & Bracey, 2005; Snibbe & Markus, 2005) and that they need to show deference to authority and *to know* their place in the hierarchy (Stephens et al., 2014). Research also suggests that employees from working-class backgrounds tend to feel uncomfortable with the idea of displaying or feigning confidence, which is inconsistent with the norms of interdependence (Townsend & Truong, 2017). Although proponents of cultural mismatch theory have not directly investigated the relationship between social class and overconfidence, their observations are consistent with our hypothesis that individuals with relatively high social class tend to be more overconfident compared with their lower-class counterparts.

### Social Rank Motive Account

A second set of findings also supports the hypothesis that social class is positively related to overconfidence. Emerging research suggests that social class shapes people's desire for social rank—the amount of social influence that people want over other group members (Berger, Rosenholtz, & Zelditch, 1980; Cheng, Tracy, Foulsham, Kingstone, & Henrich, 2013; Maner & Case, 2016). Individuals with a high desire for social rank enjoy commanding respect, having control over resources, and having the ability to exercise their wishes and desires over others (Anderson, John, Keltner, & Kring, 2001; Keltner, Gruenfeld, & Anderson, 2003; Maner & Case, 2016).

There are at least two reasons why social class shapes people's motivation to pursue positions of high social rank. First, research suggests that people generally believe that acquiring positions of high social rank often requires a pragmatic, independent, and Machiavellian approach (Belmi & Laurin, 2016). Because individuals with relatively low social class are strongly guided by interdependent and communal norms (Stephens et al., 2012, 2014; Townsend & Truong, 2017), they may see positions of high social rank as undesirable. Second, related research on social stratification has also found that members of advantaged groups tend to enjoy a host of benefits from being at the top (e.g., Phillips & Lowery, 2018); therefore, individuals with relatively high social class may desire positions of high social rank to maintain their elevated position and advantages (e.g., Kraus & Keltner, 2013). Consistent with the view that social class shapes people's motivation to pursue positions of high social rank, Belmi and Laurin (2016) found that compared with their lower-status counterparts, individuals with relatively high social class tended to report a greater desire to pursue positions of high social rank.

The desire for social rank may also help explain why higher-class individuals tend to be more overconfident compared with their lower-class counterparts. Anderson, Brion, Moore, and Kennedy (2012) theorized that people form overly positive perceptions of themselves, in part because doing so helps people achieve high social rank by convincing others that they have positive social value. Consistent with this argument, Anderson, Brion et al. (2012) found that individual differences in the desire for status predicted differences in overconfidence. In other words, desire for social rank may be one underlying mechanism that could explain the link between social class and overconfidence. Specifically, compared with individuals with relatively low social class, individuals with relatively high social class have a greater desire for social rank, which in turn promotes overconfidence.

## Downstream Consequences

The link between social class and overconfidence is inherently interesting to study for many reasons; but for us, it is particularly interesting because of its potential implications for the understanding of how status hierarchies may reproduce and perpetuate (Magee & Galinsky, 2008). Here, we draw our logic from emerging research that suggests that overconfidence can confer social advantages. For example, Anderson, Brion et al. (2012) found that

compared with less overconfident individuals, more overconfident individuals tended to attain higher social rank in groups because overconfident individuals behave in ways that make them appear competent in the eyes of others. For example, in social groups, overconfident individuals are particularly likely to speak up, use a confident and factual vocal tone, and exhibit a calm and relaxed demeanor; as a result, observers appraise overconfident individuals as competent and deserving of higher social rank.

Interestingly, Anderson, Brion et al. (2012) also found that individuals who were actually competent in these social groups did *not* display the behavioral cues that signal competence to others; as a result, those individuals were not recognized by observers as competent and deserving of high social rank. Because competence resides in the individual, Anderson, Brion et al. (2012) suggested that in social situations in which competence is ambiguous—which, as Moore and Healy (2008) suggest, is very common—observers may not accurately distinguish who is competent from those who only *appear* to be competent. Thus, if our intuition were correct that social class is positively associated with overconfidence, then this implies that their overconfidence can also provide them a path to achieving positions of high social rank, compounding the many other mechanisms that facilitate their advantages (Bird & Bogart, 2001; Darley & Gross, 1983; Kang et al., 2016; Kraus & Keltner, 2013; Laudicella, Siciliani, & Cookson, 2012; Laurin et al., 2011; Rivera, 2016; Stephens et al., 2012).

Taken together, these several literatures led us to predict that individuals with relatively high social class have a stronger tendency to be overconfident compared with their lower-class counterparts (Hypothesis 1), and that this psychology may be traced to at least one reason: a stronger desire for high social rank (Hypothesis 2). We further predicted that the overconfidence of higher-class individuals would provide a path to social advantage. Specifically, we hypothesized that individuals with relatively high social class would show higher levels of overconfidence compared with their lower-class counterparts, which in turn, would make them appear competent in the eyes of others (Hypothesis 3), and ultimately, as deserving of high social rank in the eyes of independent observers (Hypothesis 4).

## Conceptualizing and Measuring Overconfidence

One final question remains: What do we mean by overconfidence? As noted earlier, overconfidence has been studied in three distinct ways. Although we think that it would be interesting to study how social class relates to all three forms of overconfidence, in this investigation we focus solely on *overplacement*—when people have an exaggerated belief that they are better than others, when reality indicates that they are not.

There are several reasons why we chose to focus on overplacement only. First, emerging research suggests that overconfidence is not a unitary construct, and "that it is a mistake to treat them as if they were the same, or to assume that they have the same psychological origins" (Moore & Schatz, 2017, p. 1). Therefore, to keep our investigation streamlined, we chose to focus on only one form of overconfidence.

Second, on theoretical grounds, research suggests that overplacement tends to produce nonverbal and naturalistic cues of confidence (e.g., speaking first and with authority; Anderson, Brion et al., 2012), which tend to be somewhat more effective than explicit, verbal, and numeric expressions of confidence (e.g., "I am 100% that this is right") in creating positive and *enduring* reputational benefits (Tenney, Meikle, Hunsaker, Moore, & Anderson, 2019). Specifically, this emerging research has found that people who state their opinions with total certainty can receive backlash from observers when those opinions turn out to be wholly misguided, whereas those who act confidently (through more subtler forms such as tone of voice, posture, and other nonverbal cues) were afforded higher status and influence by others, even after they were shown to be overconfident about their abilities (Tenney et al., 2019; see also, Kennedy, Anderson, & Moore, 2013).

Finally, we focused on overplacement because to our knowledge, no prior research has systematically investigated the relationship between overplacement and *multiple* forms of social class. If our intuition were correct regarding the relationship between social class and overplacement, it may raise the possibility that overplacement may not be so universal as researchers think it is (Beer & Hughes, 2010; Chamorro-Premuzic, 2013; Dunning, 2005; Sharot, 2011; Taylor, 1989), and it would contribute to our understanding of the factors that shape overplacement, an area of research that has been relatively understudied to date (see Moore & Schatz, 2017). Thus, when we speak of overconfidence in these studies, we use it to refer to overplacement, specifically.

We also note that researchers have tended to measure overplacement using different methodological approaches. One approach is the *difference score approach*, whereby overplacement is calculated by subtracting a person's actual rank from their self-perceived rank (see Grijalva & Zhang, 2016). Difference scores are intuitive, face-valid, and straightforward to calculate (e.g., Griffin, Murray, & Gonzalez, 1999), but they been widely criticized by methodologists and psychometricians (e.g., Cohen, Cohen, West, & Aiken, 2003; Cronbach & Furby, 1970; Edwards, 1994a; Griffin et al., 1999; Johns, 1981; Zimmerman, 1997). Some of these critics point out that difference scores are hard to interpret because they tend to confound the variables that comprise the index (Edwards, 1994b; Johns, 1981). This can be problematic, especially when the components that make up the difference score (e.g., self-perceived performance and actual performance) are correlated. Other critics note that difference scores are vulnerable to ceiling effects and therefore may not reflect the true amount of self-enhancement (Cheng, Kornienko, & Granger, 2018; Ehrlinger, Mitchum, & Dweck, 2016). And some have pointed out that difference scores can be unreliable (Lord, 1958; Rogosa & Willett, 1983); for example, when the components that make up the difference score are correlated, the reliability of the difference score is usually less than the reliability of either component measure (Edwards, 2001).

Because of the problems associated with the use of difference scores, some scholars prefer a second approach: *the residual score approach*. In this approach, researchers calculate overplacement by regressing people's self-perceptions on their actual rank and obtaining the residuals of that model (e.g., Anderson, Brion et al., 2012; John & Robins, 1994; Paulhus & John, 1998). The residuals are purported to be an index of self-enhancement, in that these scores "represent the degree and direction of the bias that remains in the self-rankings after the behavioral-reality component has been partialed out" (John & Robins, 1994, p. 213). The use of residual scores to calculate overconfidence has become standard practice in personality and social psychology (Krueger, Heck, &

Asendorpf, 2017); it is widely believed that these scores are "cleaner" than difference scores (Griffin et al., 1999; p. 514). However, residual scores have their own fair share of critics (Krueger et al., 2017). One criticism is that residual scores of self-enhancement tend to be strongly correlated with positivity of self-views, and therefore, seems to be an inadequate way of representing a construct that is supposed to be conceptually and empirically distinct. For example, some studies have found that self-perceptions and residual scores can correlate as high as .95 (e.g., Krueger et al., 2017). Another criticism is that residual scores seem to be less conservative than difference scores; for example, these scores tend to yield "stronger and more positive correlations with third variables than difference scores" (Krueger et al., 2017, p. 3).

Finally, some scholars have used a third approach to circumvent the problems of using discrepancy scores altogether: *the joint testing procedure* (e.g., Edwards, 1995). This procedure is based on the principle that the component measures used in discrepancy scores represent conceptually distinct constructs (e.g., self-perceived performance and actual performance), and therefore should remain distinct in data analysis. In this approach, researchers use multivariate regression analysis to examine the effect of the IV (e.g., social class) on each component measure (e.g., self-perceived rank and actual rank); then, a Wilk's test is used to examine the relative magnitudes of the coefficients across equations (Edwards, 1995). The advantage of this approach is that it gives researchers a more precise understanding of how the IV relates to each of the components. However, this approach assumes that the component measures do not exert a causal influence on one another (Edwards, 1995). This assumption can be problematic, particularly in the study of overconfidence, because empirical studies have found that self-perception and actual performance tend to be interrelated: How people see themselves can impact their performance (e.g., Cameron & Granger, 2019), and it is quite possible for a person claiming to be better than average (BTA) *actually* to be better than average (e.g., Krueger & Wright, 2011; Moore & Schatz, 2017).

Scholars continue to debate which of these three approaches is the best way to measure self-enhancement (Krueger et al., 2017; Krueger & Wright, 2011). In our review of the literature, we have found that most investigations have tended to pick one of these three approaches when studying self-enhancement. Some researchers think that this practice is unfortunate because all three approaches have their own strengths and limitations (for a discussion, see Krueger et al., 2017; Krueger & Wright, 2011). Thus, rather than claim that one method is superior over others, we follow the recommendations of those who suggest that there is no one "best" way to measure self-enhancement (see Krueger et al., 2017), and that it is perhaps wise to report all valid ways of analyzing the data (Simmons, Nelson, & Simonsohn, 2011).

## Overview of Research

We predicted that individuals with relatively high (vs. low) social class have a stronger tendency to be overconfident (Hypothesis 1), and that this psychology may be traced to at least one reason: a stronger desire for high social rank (Hypothesis 2). We further predicted that the overconfidence of higher-class individuals would provide a path to social advantage: It would make them appear competent in the eyes of others (Hypothesis 3), which, in turn, would ultimately help them achieve high social rank (Hypothesis 4).

With this work, we seek to make at least three important contributions. First, our findings join a growing body of research that explores why class-based hierarchies persist. Whereas past work has highlighted how class-based hierarchies perpetuate because of explicit discrimination and prejudice of decision makers (Belmi et al., 2015; Bird & Bogart, 2001; Darley & Gross, 1983; Kang et al., 2016; Kraus & Keltner, 2013; Laudicella et al., 2012; Laurin et al., 2011; Rivera, 2016; Stephens et al., 2012), our work highlights how inequality may inadvertently arise even in the absence of explicit discrimination or prejudice (e.g., DiTomaso, 2013). Here, we test the idea that class-based inequalities may be perpetuated because high-class contexts imbue individuals with overly positive perceptions of themselves that make them *appear* more competent in the eyes of observers.

Second, our findings contribute to the research on social class and self-views (for reviews, see Côté, 2011; Kraus et al., 2012; Stephens, Markus, et al., 2014). Although there has been some suggestion in the literature that those with higher social class have overly positive illusions of themselves (e.g., Piff, 2014; Varnum, 2015), past work has not used objective indices of performance. For example, Varnum (2015) reported that the tendency to see one's self as BTA seems more prevalent among individuals with relatively high (vs. low) social class. However, as some scholars have noted, in some cases, BTA measures cannot reliably differentiate between realistic and unfounded claims. In other words, without an objective standard or criterion as a basis of comparison, it remains possible that previously reported correlations between social class and BTA measures do not necessarily reflect biased or overly positive self-perceptions. In our studies, we incorporated objective standards as a basis of comparison in our methods, thus offering much more precision compared with previous investigations.

Third, our findings contribute to the overconfidence literature. To our knowledge, no prior research has systematically investigated the relationship between overplacement and *multiple* aspects of social class (e.g., income, education, parental education, and subjective rank) nor have previous investigations offered a theory or sought to document the underlying psychological processes that might link this relationship. Furthermore, the factors that shape overconfidence (and overplacement, specifically) have been relatively understudied to date (for a recent review, see Moore & Schatz, 2017), which is unfortunate considering that overconfidence is believed to be a significant underlying cause for many organizational and societal catastrophes, such as wars, strikes, litigation, entrepreneurial failures, and stock market bubbles (Camerer & Lovallo, 1999; Glaser & Weber, 2007; Howard, 1983; Johnson, 2004; Malmendier & Tate, 2005; Neale & Bazerman, 1985; Odean, 1999). This investigation begins to fill that gap; furthermore, given the large sample sizes across our studies (one of which was preregistered), our investigation provides one of the most accurate estimates of the relationship between social class and overplacement to date.

We tested our theoretical arguments in four studies with a combined total of 152,661 individuals. We begin with a large field study ($n$ = 150,949) with small-business owners from Mexico to test the hypothesis that individuals with relatively high social class

are more overconfident compared with their lower-class counterparts. This field study allowed us to test the relationship between social class and overconfidence using a design that is high in both external and ecological validity, in a context outside of the United States. Then, in Study 2 ($n = 433$), we conduct a large multiwave study in the United States and examined *why* social class is linked to overconfidence. In Study 3, we test our theoretical arguments using a high-powered ($n = 1{,}000$), multiwave and preregistered study that was designed to rule out alternative explanations. Finally, in Study 4 ($n = 279$), we conduct a multiphase study with university students to test our final two hypotheses: whether the overconfidence of higher-class individuals would provide a path to social advantage. Finally, we conclude with an internal meta-analysis to determine the overall robustness of these findings across all four studies. Across all studies, we use multiple social class measures, analyze overplacement using three different approaches, and report all results. We set sample sizes in advance, so that we would have 80% power to detect an effect as small as $r = .14$. We met this goal for all studies except for Study 4, which was constrained by the size and the availability of students in our subject pool.

## Study 1: Large Field Study Among Small-Business Owners in Mexico

Our first study tested our primary hypothesis that individuals with relatively high social class are more overconfident compared with their lower-class counterparts. To test this hypothesis, we examined the relationship between social class and overplacement in a large field study ($N = 150{,}949$) of small-business owners from Mexico.

### Method

**Participants and procedure.** We obtained data from EFL Global (now LenddoEFL), an alternative credit scoring firm that works with leading financial institutions across Latin America, Africa, Asia, and Europe. EFL specializes in developing behavioral and psychometric assessments for the purpose of predicting the risk profile of small-business owners and consumers. For the purposes of the present investigation, EFL had relevant data from 150,949 small-business owners from Mexico. Overall, applicants were mostly female (62%); on average, they were 38.81 years old ($SD = 12.75$), requesting loan sizes between 8,000 MXN to 2,000,000 MXN (equivalent to \$429–\$107,294; median \$804) with a term of between 6 and 18 months (median 12 months). Table 1 provides a comprehensive breakdown of participants.

EFL collected the data from small-business owners at the time they were applying for a loan at a microfinance institution (MFI) in Mexico from 2015 to 2017. As part of the loan application process, a prospective borrower had to complete a short psychometric assessment developed by EFL. Loan officers used the results of this psychometric application to assess whether applicants were creditworthy.

The MFI loan officers administered the psychometric assessment during a site visit to the applicants' place of business. Applicants were given an electronic tablet to complete the assessment, which was delivered in Spanish. As is standard practice for EFL, extensive procedures were conducted to make sure that their assessment test was as clear as possible for test takers. Their assessment tests were first developed in English; then translated into Spanish by a native speaker from their Mexico team, then back-translated into English by a native language speaker who was blind to the original content. Furthermore, they conducted extensive pilot testing with small-business owners from their target population to ensure that their assessment test was as clear as possible.

Table 1
*Demographic Distribution of Small-Business Owners in Mexico*

| Category | Percentage |
|---|---|
| Gender | |
| Male | 38% |
| Female | 62% |
| Monthly business revenues | |
| Less than Mex \$10,000 | 8% |
| Mex \$10,000–Mex \$14,999 | 17% |
| Mex \$15,000–Mex \$19,999 | 15% |
| Mex \$20,000–Mex \$29,999 | 22% |
| Mex \$30,000–Mex \$49,999 | 16% |
| Mex \$50,000–Mex \$99,999 | 12% |
| Mex \$100,000–Mex \$199,999 | 10% |
| Greater than Mex \$200,000 | 0% |
| Education | |
| Elementary | 41% |
| High school | 42% |
| Associate | 9% |
| College degree | 7% |
| Graduate/professional degree | 1% |
| Subjective class | |
| $M_{\text{Subjective Class}}$ | 6.97 |
| $SD_{\text{Subjective Class}}$ | 1.90 |
| Age | |
| $M_{\text{Age}}$ | 38.81 |
| $SD_{\text{Age}}$ | 12.75 |

The psychometric assessment that EFL developed consists of many modules, one of which is relevant for the purposes of the present investigation: the flashcard game. The flashcard game is a cognitive test on memory and executive functioning. In the flashcard game, participants are presented with an image; after pressing a key, they are shown a second image. Participants are then asked to indicate whether the second image matches the first. The flashcard game is scored based on whether or not the participant correctly identifies a match.

Participants completed a few practice trials to ensure that they understood the task. Then, they played the actual game, which consisted of 20 trials. At the end of the flashcard exercise, participants saw a question that asked them to estimate how well they think they did on this particular exercise relative to other applicants (1 = *at the very bottom, worse than all other applicants*; 100 = *at the very top, better than all other applicants*). This question was added to the psychometric application for the purpose of this study and was not, in any way, used in influencing the loan decision. Participants did not receive any feedback about their performance.

**Measures.**

***Overplacement.*** As we outlined in the introduction, we calculated overplacement in three different ways. First, we computed overplacement using the *residual score approach* (e.g., Anderson, Brion et al., 2012). We calculated the participant's actual score in the flashcard exercise and transformed it into a percentile ranking. Then, we regressed participants' self-perceived rank on their actual

Table 2
*Descriptive Statistics and Zero-Order Correlations of Study 1 Variables*

| Variable | Mean | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Gender | — | — | | | | | | | | | | | |
| 2. Marital status | — | — | .06 | | | | | | | | | | |
| 3. Age | 38.81 | 12.75 | .03 | .13 | | | | | | | | | |
| 4. Dependents | 1.21 | 1.20 | .06 | .19 | −.13 | | | | | | | | |
| 5. Loan requested | 25607.54 | 40390.03 | .05 | .06 | .03 | .02 | | | | | | | |
| 6. Subjective social class | 6.97 | 1.90 | −.02 | −.01 | .05 | −.05 | .03 | | | | | | |
| 7. Income | 3.96 | 1.74 | .09 | .00 | .08 | −.06 | .23 | .15 | | | | | |
| 8. Education | 1.85 | .93 | .05 | −.05 | −.18 | −.03 | .10 | .08 | .11 | | | | |
| 9. Self-perceived rank | 81.52 | 19.09 | .01 | .00 | .03 | −.01 | .02 | .26 | .11 | .02 | | | |
| 10. Actual rank | 50.67 | 28.45 | .02 | −.09 | −.04 | −.11 | −.02 | .13 | .20 | .04 | .22 | | |
| 11. Overplacement (resid) | .00 | 18.64 | .01 | .02 | .03 | .01 | .02 | .24 | .06 | .01 | .98 | .00 | |
| 12. Overplacement (diff) | 30.85 | 30.66 | −.01 | .08 | .05 | .09 | .03 | .04 | −.12 | −.03 | .42 | −.79 | .61 |

*Note*. Given our sample size ($N$ = 150,949), correlations of .01 or higher are significant at $p < .01$, and correlations of .02 or higher are significant at $p < .001$.

rank and extracted the residuals of their self-evaluations (Cohen, Cohen, West, & Aiken, 2003; Cronbach & Furby, 1970; DuBois, 1957; John & Robins, 1994).[1] This residual score captures the variability in self-perceived rank after the variance predicted by actual rank has been removed (see Anderson, Brion et al., 2012).

Second, we computed overplacement using the *difference score approach* (e.g., Sheldon, Dunning, & Ames, 2014). Here, we simply subtracted the participants' actual rank from their self-perceived rank.

Third, we computed overplacement using the *joint testing procedure* outlined by Edwards (1995). In this approach, we first estimated the effects of social class on perceived rank and actual rank separately; then we used a Wilk's test to examine the relative impact of social class on each of these variables.[2]

***Social class.*** EFL provided us with the participant's social class, all of which were obtained from the participant's loan application form. Social class was measured in three ways. To indicate subjective social class, participants saw an image of a ladder that "represents where people stand in your country." and selected the rung on which they felt they stood, relative to other people in their country (Adler et al., 2000; Kraus et al., 2009). To indicate objective social class, respondents reported their highest educational attainment (1 = *elementary*, 2 = *high school degree*, 3 = *associate diploma*, 4 = *college degree*, 5 = *graduate/professional degree*), as well as their monthly business revenues (1 = *less than 10,000 Mexican Pesos*, 8 = *200,000 Mexican Pesos or Higher*).

***Control variables.*** In addition to our focal variables, we also obtained important demographic information from EFL, such as the applicant's gender (0 = *female*, 1 = *male*), marital status (0 = *not married*, 1 = *married*), number of dependents, age, and the loan amount that the respondent requested. We controlled for these variables in our robustness tests to increase our confidence that any relationship we would observe between social class and overconfidence were not due to these third variables.

## Results

Descriptive statistics and zero-order correlations are presented in Table 2. Those with more education, income, and a higher subjective sense of standing in society were more likely to think that they did better on the flashcard game, compared with their lower-status counterparts ($rs_{range}$ = .02 to .26, all $ps < .001$). This is consistent with the extant literature on social class and positivity of self-views. Furthermore, all three forms of social class were positively associated with actual rank, indicating that those with relatively high social class did objectively better on the flashcard game relative to their lower-class counterparts ($rs_{range}$ = .04 to .20, all $ps < .001$).

The key question, however, is whether their perceptions of their standing exceeded the reality of their relative standing. To test the hypothesis that individuals with relatively high social class are more overconfident compared with individuals with relatively low social class (Hypothesis 1), we conducted three sets of analytical tests. The first set of analytic tests consisted of regressing overplacement scores (calculated using the residual score approach) on (mean-centered) social class, without and with covariates. In total, this first set of analysis consisted of six separate regression models (three measures of social class, without and with covariates). The second analytic test was identical to the first, except this time we used difference scores to operationalize overconfidence (again, this set of analytic tests consisted of six separate regression models). Finally, in the third analytic test, we estimated the effects of social class on perceived performance and actual performance separately (without and with covariates). We then used the Wilk's statistic and its corresponding $F$ test to test the hypothesis that the effect of class on perceived rank is stronger than the effect of class on actual rank (Edwards, 1995). The key results for all analyses are reported in Table 3.

[1] In other words, the residual scores are the residuals of SelfPerceivedRank $\sim b_0 + b_1$ActualRank + $\varepsilon$ (see Anderson, Brion, et al., 2012).

[2] This approach decomposes the difference score model into two separate regression equations. Whereas the difference score model is estimated by the following equation (SelfPerceivedRank − ActualRank $\sim b_0 +$ SocialClass + $\varepsilon$), this alternative approach recasts this model into two equations, using self-perceived rank and actual rank as separate dependent variables (Eq1: SelfPerceivedRank $\sim b_{10} + b_{11}$SocialClass + $\varepsilon$; Eq2: ActualRank $\sim b_{20} + b_{21}$SocialClass + $\varepsilon$). Evidence for Hypothesis 1 would be supported if $b_{11}$SocialClass > $b_{21}$SocialClass, as indicated by the Wilk's test (Edwards, 1995).

Table 3
*Summary of Key Results in Study 1*

| Class index | Covariate | Perceived rank (P) | Actual rank (A) | Test of overconfidence | | |
|---|---|---|---|---|---|---|
| | | | | Residual score approach | Difference score approach | Joint testing approach |
| Subjective | No | $b = 2.61$, $t = 104.68$ | $b = 1.92$, $t = 50.37$ | $b = 2.33$, $t = 95.23$ | $b = .69$, $t = 16.58$ | P > A, $\Lambda = 1$, $F = 274.84$ |
| | Yes | $b = 2.61$, $t = 104.28$ | $b = 1.91$, $t = 50.44$ | $b = 2.33$, $t = 94.95$ | $b = .69$, $t = 16.75$ | P > A, $\Lambda = 1$, $F = 280.41$ |
| Income | No | $b = 1.15$, $t = 41.10$ | $b = 3.27$, $t = 79.19$ | $b = .68$, $t = 24.80$ | $b = -2.11$, $t = -46.90$ | P < A, $\Lambda = .99$, $F = 2199.51$ |
| | Yes | $b = 1.16$, $t = 39.71$ | $b = 3.50$, $t = 82.68$ | $b = .65$, $t = 22.81$ | $b = -2.34$, $t = -50.66$ | P < A, $\Lambda = .98$, $F = 2566.91$ |
| Education | No | $b = .42$, $t = 8.01$ | $b = 1.32$, $t = 16.73$ | $b = .23$, $t = 4.52$ | $b = -.89$, $t = -10.53$ | P < A, $\Lambda = 1$, $F = 110.87$ |
| | Yes | $b = .49$, $t = 9.07$ | $b = .97$, $t = 12.08$ | $b = .35$, $t = 6.64$ | $b = -.48$, $t = -5.52$ | P < A, $\Lambda = 1$, $F = 30.42$ |

*Note.* All $t$ and $F$ values in Table 3 are significant at $p < .001$. P > A indicates that the social class index has a stronger effect on perceived rank than actual rank; P < A indicates that the social class index has a stronger effect on actual rank than perceived rank.



When we used residual scores in our analysis, there was robust and consistent evidence for Hypothesis 1: As Table 3 shows, we found that across *all forms* of social class (i.e., subjective rank, income, and education), individuals with relatively high social class tended to be more overconfident compared with their lower-class counterparts (all $p$s $< .001$). This finding remained robust even after controlling for a wide variety of demographic variables.

However, when we used difference scores in our analysis (or the alternative joint testing procedures outlined by Edwards, 1995), findings were mixed. Here, Hypothesis 1 was supported only in the case of subjective social class. For objective social class, a somewhat different conclusion was reached: Here we found that more-educated and wealthier respondents tended to be *less* overconfident compared with their lower-class counterparts (all $p$s $< .001$).

## Discussion

Study 1 tested the relationship between social class and overconfidence using a large field sample of business owners in Mexico. We found consistent and robust evidence for Hypothesis 1 when we operationalized overconfidence using the residual score method, but not when we used the difference score method. When residual scores were used, we found that across *all* forms of social class, those with relatively high social class were more overconfident compared with their lower-class counterparts, even after we controlled for a wide range of demographic variables.

However, when difference scores were used (or the alternative joint-testing procedure), the conclusions were not so straightforward. Here, we found support for Hypothesis 1 only in the case of subjective social class. The difference score approach also showed that education and income were *negatively* associated with overconfidence, directly contrasting the results generated by the residual score approach.

A reader may wonder which of these methodological approaches is the "best" way to measure overplacement and which conclusion is "correct." As noted earlier, researchers disagree on the best way to measure overplacement, and these methodological debates are discussed extensively elsewhere (see Krueger et al., 2017; Krueger & Wright, 2011). That said, we do note that across all three analytical approaches, there was at least one point of convergence in this study: Regardless of the analytical approach (e.g., difference scores vs. residual scores), we found robust and consistent support for Hypothesis 1 when we defined social class in terms of people's subjective sense of standing in society. Thus, we can at least definitively conclude that in this study, there was *unambiguous* support that subjective social class has a robust and positive relationship with overconfidence, consistent with Hypothesis 1. Where the three analytic approaches diverge is on objective social class. Here, the findings were mixed. So, rather than draw a (potentially premature) conclusion, we simply note this discrepancy and wait until we have more data to make more definitive claims.[3]

Overall, Study 1 has at least three notable strengths. First, it featured an extensive sample of nearly 151,000 small-business owners from a wide variety of social class spectrums in a cultural context outside of the United States. Second, the design of Study 1 had high external and ecological validity: The field study allowed us to examine the relationship between social class and overconfidence in a naturally occurring setting, using data from real-world business owners. Third, it found a robust relationship between subjective class and overconfidence, even after controlling for a wide variety of demographic variables.

[3] There have been some published studies in which researchers have found that the residual score approach and the difference score approach produced divergent conclusions (e.g., Griffin et al., 1999). While we acknowledge that the evidence generated by the difference score approach is inconsistent with our hypothesis, we strongly urge readers to treat those results with caution. As noted in our review, there are many problems associated with the difference score approach, and many researchers have suggested that these problems could produce misleading conclusions. We have strong reasons to believe that the criticisms raised by methodologists and psychometricians regarding difference scores are legitimate concerns in these studies. We detail these concerns more fully in the SOM, but we highlight some of them here. One concern is that the difference score approach is inappropriate, given that percentile estimates have a ceiling of 100. As Ehrlinger, Mitchum, and Dweck (2016) note, an individual scoring in the 95th percentile can be, at most, be overconfident by 5 percentile points while lower-scoring individuals are able to display much more overconfidence. In Study 1, over one-fifth of participants ($n = 31{,}495$) had a perfect score on the flashcard game (i.e., they scored 20 out 20), and over 63% of our participants ($n = 96{,}013$) were high performing, scoring at least 15 out of 20 (75% correct). Therefore, using the difference score approach in this study could potentially fail to capture the true amount of self-enhancement for a large majority of participants. Another concern is that in this study, the difference score confounds the components that make up the difference score: Those who thought they did better than others in the flashcard exercise *were, in fact, better than others* (see Table 2). We encourage readers who are interested in these additional analyses to visit our SOM.

Despite its strengths, this study also had limitations. First, it did not test the underlying mechanism. Because we were not responsible for developing the survey instrument, we were constrained in the hypotheses that we were able to test. Second, while the evidence was consistent and robust for subjective social class, the findings were mixed and inconclusive for objective social class. Third, it is possible that the results of this study are specific to this context. To address these limitations, we conducted a follow-up study.

## Study 2: Examining the Mechanisms Using a Multiwave Study

Study 2 had three goals. First, we sought to replicate the relationship between social class and overconfidence in the U.S. context. Second, we wanted to test the robustness of this relationship; we did so by measuring a wide array of individual difference and demographic variables that may plausibly act as third variables. Third, we sought to test the theoretical account, posited in the introduction, which may illuminate the link between social class and overconfidence. Specifically, we tested whether the overconfidence of higher-class individuals derives, in part, from their desire to attain social rank (Hypothesis 2).

To accomplish these objectives, we conducted a multiwave study. At Time 1, we collected demographic information from our participants and administered individual difference measures that we intended to use as extended controls in our robustness checks. At Time 2, we assessed people's desire for high social rank (our proposed mediator). At Time 3, we administered a task that measured overconfidence (our primary dependent variable).

### Method

**Participants.** We advertised a three-part study on "Attitudes, Beliefs, and Cognitive Abilities" on Amazon Mechanical Turk (MTurk). We told participants that if they chose to participate, they would receive three surveys during the week, each of which would pay out $2.00. To motivate participants to complete all three, we told them that they would earn an additional $1.00 if they completed all three.

Five hundred individuals from MTurk completed Part 1. A few days later, 472 (94.40% response rate) completed Part 2, and 477 (95.40% response rate) completed Part 3. There were no differences in gender, age, ethnic status, or (subjective and objective) social class between those who did and did not complete all three surveys ($ps_{range}$ = .08 to .99).

In the analyses below, we report the results for participants who completed all three surveys and who indicated that they were not a student ($N$ = 433; 87% response rate). Table 4 provides a more comprehensive description of the final sample in this and the subsequent studies.

**Procedure.** Because our goals necessitated examining a large number of constructs, we used a multiwave design, an approach recommended by scholars for minimizing common method variance and respondent fatigue (e.g., Podsakoff, Mackenzie, & Podsakoff, 2012). We sent participants three short surveys that were administered a few days apart. We provide exact item wordings of all measures in the supplemental online material (SOM). Unless otherwise noted, participants answered our measures using a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*).

Table 4
*Distribution of Participants Across Studies 2 to 4*

| Category | Study 2 | Study 3 | Study 4 |
|---|---|---|---|
| Gender | | | |
| Male | 58% | 52% | 28% |
| Female | 42% | 48% | 72% |
| Ethnicity | | | |
| African American | 7% | 8% | 15% |
| White American | 85% | 76% | 53% |
| Asian American/Pacific Islander | 4% | 7% | 26% |
| Latino American | 3% | 5% | 5% |
| Native American | <1% | 1% | NA |
| Other | NA | 2% | NA |
| Income | | | |
| Less than $20,000 | 12% | 11% | 3% |
| $20,000–$40,000 | 27% | 24% | 4% |
| $40,001–$60,000 | 24% | 22% | 7% |
| $60,001–$80,000 | 16% | 18% | 10% |
| $80,001–$100,000 | 10% | 10% | 12% |
| $100,001–$120,000 | 4% | 5% | 12% |
| $120,001–$140,000 | 2% | 2% | 8% |
| $140,001–$160,000 | 2% | 3% | 4% |
| $160,001–$180,000 | 1% | 1% | 4% |
| $180,001–$200,000 | <1% | 1% | 8% |
| $200,001–$220,000 | 0% | <1% | 7% |
| $220,001–$240,000 | 0% | <1% | 4% |
| $240,001–$260,000 | 1% | <1% | 4% |
| $260,001–$280,000 | 0% | <1% | 2% |
| $280,001–$300,000 | <1% | 1% | 4% |
| Greater than $300,000 | 0% | 1% | 6% |
| Education | | | |
| Some High School | <1% | <1% | |
| High School | 12% | 12% | |
| Some College | 29% | 29% | |
| College Degree | 43% | 43% | |
| Graduate/Professional Degree | 16% | 17% | |
| Parental Education | | | |
| $M_{\text{Parental Education}}$ | 2.94 | 2.94 | 4.14 |
| $SD_{\text{Parental Education}}$ | 1.02 | 1.07 | .82 |
| Subjective Class | | | |
| $M_{\text{Subjective Class}}$ | 4.48 | 4.58 | 6.62 |
| $SD_{\text{Subjective Class}}$ | 1.59 | 1.69 | 1.39 |
| Age | | | |
| $M_{\text{Age}}$ | 36.90 | 37.24 | 20.10 |
| $SD_{\text{Age}}$ | 10.69 | 11.39 | 1.38 |

*Note.* In Study 4, participants were university students. As stated in the main text, income in that study refers to their family's annual household income.

***Time 1.*** We collected demographic information from our participants and administered individual difference measures that we intended to control for in our robustness checks. These measures include:

*The 10-item personality measure.* The 10-item personality measure (Gosling, Rentfrow, & Swann, 2003) is a short personality test that contains measures of openness, conscientiousness, extraversion, agreeableness, and neuroticism. We measured these personality constructs because research suggests that they sometimes covary with social class (e.g., Piff, 2014) and overconfidence (e.g., Anderson, Brion et al., 2012; Costa & McCrae, 1992; Schaefer, Williams, Goodie, & Campbell, 2004).

*Optimism.* Optimism captures the extent to which people hold generalized favorable expectancies for their future (Scheier, Carver, & Bridges, 1994); it tends to covary with overconfidence

(Anderson, Brion et al., 2012; Wolfe & Grosch, 1990). We measured optimism using the revised life orientation test (Scheier et al., 1994; $\alpha = .92$).

*Social dominance orientation (SDO).* SDO captures people's preferences for hierarchies, which has been shown to covary with social class (e.g., Belmi & Laurin, 2016). We measured SDO using the SDO-7 scale (Ho et al., 2015; $\alpha = .94$).

*Demographic controls.* At the end of the survey, participants answered a demographic questionnaire. Participants reported their gender (0 = *female*, 1 = *male*), their ethnicity (which we dummy-coded in our analyses: 0 = *non-White*, 1 = *White*), and whether they are a part-time/full-time student (0 = *no*, 1 = *yes*).

*Social class.* Participants answered four measures of social class: (a) the ladder measure of subjective social class from Study 1; (b) participants' annual household income (1 = *less than $20,000*, 16 = *greater than* $300,000); (c) the participants' own highest educational attainment (1 = *some high school;* 5 = *graduate/professional degree*); and (d) their mother and father's educational attainment, which we averaged to form a composite for parental education.[4]

***Time 2: Desire for social rank (proposed mediator).*** A few days after completing our Time 1 survey, participants received a link to our Time 2 survey, which contained measures of our proposed mediator (i.e., desire for social rank). Because there are multiple ways of measuring these constructs, we conducted a careful review of the literature and narrowed our selection to the most face-valid instruments that capture this motivation:

*Prestige and dominance motivation.* We administered Cassidy and Lynn's (1989) dominance ($\alpha = .93$) and prestige ($\alpha = .90$) motivation scales, both of which relate to people's rank-striving motives. Dominance motivation captures an individual's motivation to achieve social rank through dominance tactics (e.g., intimidation, fear), whereas prestige motivation captures an individual's motivation to achieve social rank through respect and admiration (Case & Maner, 2014; Maner & Mead, 2010; Mead & Maner, 2012). In their review of the literature, Maner and Case (2016) noted that even though these motivations lead to qualitatively different types of behaviors, they also tend to correlate highly, because both measures reflect the underlying desire for high social rank. An example item from the dominance motivation scale is "I like to give orders and get going"; an example item from the prestige motivation scale is "I want to be an important person in the community."

*Desire for advancement.* We administered Belmi and Laurin's (2016) 10-item desire-for-advancement scale. This scale captures the extent to which people are motivated to seek positions of high rank (sample item: "In an organizational setting, I want to be in a position with the most power"; $\alpha = .98$).

*Desire for social rank.* We used a four-item scale by Anderson, Willer et al. (2012) that assessed people's desire for social rank (sample item: "How much do you desire having higher social status compared with others?"; 1 = *not at all*, 7 = *extremely*; $\alpha = .96$).

As expected, these four measures correlated with each other (see Table 5). We standardized all four, averaged them ($\alpha = .92$), and used the composite score in our analyses.[5]

***Time 3: Overconfidence.*** At Time 3, we administered a task that measured overconfidence (i.e., overplacement). We told participants that they would take a test that was purportedly designed to measure their general mental abilities. Specifically, we gave participants a 20-item exam consisting of items drawn from the Wonderlic Personnel Test (Wonderlic, 1961), an exam that is widely used by employers to assess an applicant's general cognitive abilities (see SOM). Each question was timed: Participants had only 20 seconds to answer the question before the survey automatically moved on to the next question.

After completing the test, we asked participants two questions to assess their perceptions of their performance: (a) how well they think they did on the test, relative to other MTurkers in the study; and (b) how they compared with other MTurkers on their general mental abilities. Each question was accompanied by a slider scale (1 = *at the very bottom, worse than all other MTurkers taking this study*; 100 = *at the very top, better than all other MTurkers taking this study*). These two items correlated very strongly, $r = .82$, $p < .001$, so we combined them to measure self-perceived percentile rank.

## Results

Means, standard deviations, and zero-order correlations are presented in Table 5. As can be seen in that table, all forms of social class were again positively associated with self-perceived rank ($rs_{range} = .14$ to $.27$, all $ps < .01$), consistent with the literature on social class and positivity of self-views. In terms of actual performance, we found that participants tended to do better when they were more educated ($r = .18$, $p < .001$) or had more educated parents ($r = .12$, $p = .01$), whereas those with greater income ($r = .07$, $p = .16$) and a greater sense of subjective status ($r = .05$, $p = .29$) did just as well as their lower-class counterparts.

To test the hypothesis that social class would be positively associated with overconfidence (Hypothesis 1), we followed the same analytic approach as in Study 1. Specifically, in the first analytic test, we regressed overplacement (computed through the residual score approach) on (mean-centered) social class, without and with covariates (i.e., gender, ethnic status, optimism, SDO,

[4] In the main text, we treat parental education as a continuous variable following the lead of other researchers (Kraus et al., 2009; Martin et al., 2016). However, we also conducted additional analyses that treated parental education following Stephens et al. (2007), classifying participants as coming from a middle-class background if one or both parents had a college degree, and as coming from a working-class background if neither parent had a college degree. Using this variable, the results for overconfidence across Studies 2 to 4 were in the predicted direction, but reached traditional levels of significance in Study 3 only ($ps < .01$). However, its effect on desire for social rank was significant in Studies 2 and 3 (all $ps < .01$), and its indirect effect on overconfidence via desire for social rank remained significant in both studies.

[5] At Time 2, we also included several measures that captured positivity in self-views. These include the *core self-evaluation scale* (Judge & Hurst, 2007), the *personal sense of power scale* (Anderson et al., 2012), *the sense of control scale* (Lachman & Weaver, 1998), and *the Narcissistic Personality Inventory* (NPI; Ames, Rose, & Anderson, 2006). We included these measures in Time 2 because we originally conceptualized positivity of self-view as another potential mediator of the social class and overconfidence link. However, two early reviewers pointed out that positivity of self-view and overconfidence share too much conceptual overlap, and thus we dropped these measures from our analysis. We do note here that we replicate existing work, and found that higher social class was associated with more positive self-views, and that positive self-views, in turn, were associated with overplacement. Desire for social rank also emerged as a significant mediator, even after controlling for positivity in self-views.

Table 5
*Descriptive Statistics and Zero-Order Correlations of Study 2 Variables*

| Variable | Mean | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Race | — | — | | | | | | | | | | | | | | | | | | | | | |
| 2. Gender | — | — | .11 | | | | | | | | | | | | | | | | | | | | |
| 3. Subjective | 4.48 | 1.59 | −.05 | .00 | | | | | | | | | | | | | | | | | | | |
| 4. Income | 3.37 | 2.02 | −.01 | −.02 | .64 | | | | | | | | | | | | | | | | | | |
| 5. Education | 3.63 | .90 | −.01 | .00 | .37 | .25 | | | | | | | | | | | | | | | | | |
| 6. Parental | 2.94 | 1.02 | −.07 | .06 | .17 | .13 | .30 | | | | | | | | | | | | | | | | |
| 7. Openness | 4.98 | 1.42 | −.04 | −.03 | −.02 | −.03 | −.01 | .14 | | | | | | | | | | | | | | | |
| 8. Conscientiousness | 5.41 | 1.24 | −.11 | −.11 | .17 | .10 | .01 | −.07 | .12 | | | | | | | | | | | | | | |
| 9. Extraversion | 3.41 | 1.54 | .00 | .00 | .25 | .12 | .06 | .04 | .16 | .19 | | | | | | | | | | | | | |
| 10. Agreeableness | 4.68 | 1.41 | −.02 | .00 | .16 | .06 | .03 | −.04 | .09 | .25 | .21 | | | | | | | | | | | | |
| 11. Neuroticism | 4.56 | 1.65 | −.03 | .18 | .22 | .08 | .07 | .06 | .07 | .34 | .41 | .38 | | | | | | | | | | | |
| 12. Optimism | 4.61 | 1.59 | −.02 | −.03 | .34 | .16 | .04 | .02 | .09 | .38 | .46 | .46 | .59 | | | | | | | | | | |
| 13. SDO | 2.44 | 1.32 | .05 | .05 | .12 | .05 | −.04 | .03 | −.20 | −.02 | .14 | −.17 | .06 | .08 | | | | | | | | | |
| 14. Status Motive Scale | 3.05 | 1.70 | .00 | .17 | .13 | .13 | .16 | .17 | .07 | .00 | .19 | −.09 | .09 | .01 | .19 | | | | | | | | |
| 15. Dominance Motivation | 4.09 | 1.40 | .01 | .08 | .22 | .13 | .18 | .14 | .12 | .15 | .39 | −.02 | .31 | .26 | .17 | .60 | | | | | | | |
| 16. Prestige Motivation | 4.01 | 1.30 | .00 | .09 | .19 | .13 | .18 | .14 | .12 | .07 | .38 | .03 | .19 | .15 | .18 | .75 | .77 | | | | | | |
| 17. Desire for Advancement | 3.54 | 1.63 | −.01 | .17 | .14 | .09 | .08 | .10 | .11 | .09 | .30 | −.01 | .23 | .12 | .21 | .74 | .79 | .81 | | | | | |
| 18. Status Motive Composite | .00 | .90 | .00 | .14 | .19 | .13 | .17 | .15 | .12 | .09 | .35 | −.02 | .23 | .15 | .21 | .86 | .88 | .93 | .93 | | | | |
| 19. Perceived Rank | 65.52 | 18.01 | −.04 | .19 | .27 | .16 | .16 | .14 | .00 | .02 | .12 | .02 | .21 | .14 | .11 | .25 | .26 | .21 | .17 | .25 | | | |
| 20. Actual Rank | 50.67 | 28.32 | −.01 | .10 | .05 | .07 | .18 | .12 | −.06 | −.10 | −.13 | −.10 | .02 | −.06 | −.11 | −.04 | −.04 | −.11 | −.10 | −.08 | .37 | | |
| 21. Residual Scores | .00 | 16.76 | −.04 | .17 | .27 | .14 | .11 | .10 | .03 | .07 | .18 | .06 | .22 | .18 | .17 | .28 | .30 | .27 | .23 | .30 | .93 | .00 | |
| 22. Difference Scores | 14.85 | 27.44 | −.02 | .03 | .12 | .03 | −.08 | −.03 | .06 | .12 | .21 | .11 | .11 | .16 | .19 | .21 | .22 | .25 | .22 | .25 | .28 | −.79 | .61 |

*Note*. Given our sample size, correlations of .10 or higher are significant at $p < .05$, .13 or higher are significant at $p < .01$, .17 or higher are significant at $p < .001$.

Table 6
*Summary of Key Results in Study 2*

| Class index | Covariates? | Perceived rank (P) | Actual rank (A) | Test of overconfidence: Residual score approach | Test of overconfidence: Difference score approach | Test of overconfidence: Joint testing approach |
|---|---|---|---|---|---|---|
| Subjective | No | $b = 3.03$, $t = 5.76^{***}$ | $b = .90$, $t = 1.05$ | $b = 2.82$, $t = 5.76^{***}$ | $b = 2.13$, $t = 2.58^{**}$ | P > A, $\Lambda = .98$, $F = 6.65^{**}$ |
| | Yes | $b = 2.59$, $t = 4.70^{***}$ | $b = 1.56$, $t = 1.78^{\dagger}$ | $b = 2.23$, $t = 4.32^{***}$ | $b = 1.03$, $t = 1.21$ | P > A, $\Lambda = 1$, $F = 1.45$ |
| Income | No | $b = 1.39$, $t = 3.28^{***}$ | $b = .95$, $t = 1.42$ | $b = 1.17$, $t = 2.95^{**}$ | $b = .43$, $t = .67$ | P > A, $\Lambda = 1$, $F = .44$ |
| | Yes | $b = 1.15$, $t = 2.76^{**}$ | $b = 1.03$, $t = 1.59$ | $b = .91$, $t = 2.34^{*}$ | $b = .11$, $t = .18$ | P > A, $\Lambda = 1$, $F = .03$ |
| Education | No | $b = 3.29$, $t = 3.44^{***}$ | $b = 5.58$, $t = 3.73^{***}$ | $b = 1.99$, $t = 2.22^{*}$ | $b = -2.30$, $t = -1.56$ | P < A, $\Lambda = .99$, $F = 2.44$ |
| | Yes | $b = 3.11$, $t = 3.38^{***}$ | $b = 5.48$, $t = 3.84^{***}$ | $b = 1.83$, $t = 2.12^{*}$ | $b = -2.37$, $t = -1.69$ | P < A, $\Lambda = .99$, $F = 2.86$ |
| Parental | No | $b = 2.42$, $t = 2.87^{***}$ | $b = 3.31$, $t = 2.49^{*}$ | $b = 1.65$, $t = 2.10^{**}$ | $b = -.89$, $t = -.69$ | P < A, $\Lambda = 1$, $F = .47$ |
| | Yes | $b = 1.66$, $t = 1.98^{*}$ | $b = 2.30$, $t = 1.76^{\dagger}$ | $b = 1.12$, $t = 1.44$ | $b = -.64$, $t = -.50$ | P < A, $\Lambda = 1$, $F = .25$ |

$^{\dagger} p < .10$. $^{*} p < .05$. $^{**} p < .01$. $^{***} p < .001$.

and the Big Five personality traits). In the second analytic test, we reran the same set of regression models, but this time we used difference scores. In the third analytic test we used the joint testing method (Edwards, 1995). The results of these analyses are summarized in Table 6.

As in Study 1, Hypothesis 1 was not supported when we used difference scores or the alternative joint testing procedure, but it was strongly supported when we used residual scores in our analysis. As can be seen in Table 6, the analyses involving residual scores showed that across *all* forms of social class, individuals with relatively high social class tended to be more overconfident compared with their lower-class counterparts. Furthermore, this finding was particularly robust in the case of subjective class, education, and income, and somewhat less robust in the case of parental education (i.e., the effect of parental education on overconfidence was still in the expected direction in the robustness test, but did not achieve traditional levels of significance).

**Desire for social rank.** We next analyzed desire for social rank. We regressed desire for social rank on (mean-centered) social class, without and with covariates (see Table 7). As can be seen, we found robust evidence that across all forms of social class, those with relatively high social class reported a stronger desire for high social rank compared with individuals with relatively low social class, $bs_{range} = .05$ to .17, $ts_{range} = 2.55$ to 4.04, $ps_{range} = <.001$ to $<.01$. These results are consistent with Hypothesis 2.

To test the hypothesis that desire for social rank would mediate the link between social class and overconfidence, we conducted a mediation analysis with bias-corrected bootstraps (1,000 iterations), treating social class as the independent variable, overconfidence as the dependent variable, and desire for social rank as the mediator.[6] We conducted this analysis 16 times (two ways of calculating overplacement times four measures of social class, with and without covariates). The results of these analyses are summarized in Table 7. As can be seen, desire for social rank emerged as a reliable mediator: Regardless of whether overconfidence was operationalized in terms of residual scores or difference scores, all confidence intervals excluded zero, in both basic and robustness tests, across all measures of social class. These results provide strong support for Hypothesis 2.

## Discussion

Study 2 revealed at least two important findings. As in Study 1, we found consistent and robust evidence for Hypothesis 1, at least when we operationalized overconfidence using the residual score method. We found that individuals with relatively high social class were more overconfident compared with their lower-class counterparts, and in three out of four class indices, the relationship between social class and overconfidence was robust, even after controlling for a comprehensive range of demographic (e.g., gender, ethnic status) and personality variables (e.g., extraversion, optimism, SDO) that could shape people's overconfidence. We should note, however, that just as in Study 1, Hypothesis 1 did not receive strong support when we used the difference score approach or the joint estimation procedure.[7]

Second, and more importantly, Study 2 found evidence for our proposed mechanism regarding the underlying link between social class and overconfidence. Specifically, Study 2 showed that compared with participants with relatively low social class, participants with relatively high social class had a stronger desire for social rank, which, in turn, was associated with more overconfidence. This indirect effect emerged across all forms of social class and was robust *regardless* of whether we used residual scores or difference scores.

On the whole, Study 2 found some support that social class is systematically linked to overconfidence, and that it shapes people's desire for social rank. This study had at least four notable strengths. First, by using a multiwave design that temporally separated the key constructs, we gained some assurance that the relationships that we observed were not attributable to common method bias (Podsakoff et al., 2012). Second, Study 2 used four different ways of measuring the mediator, suggesting a generalizable relationship between social class and desire for social rank.

[6] Even though we did not find a direct effect of social class on overplacement in our analyses using difference scores, we tested for indirect effects following recommendations by several scholars (Hayes, 2016; Rucker, Preacher, Tormala, & Petty, 2011; Zhao, Lynch Jr., & Chen, 2010), who have argued that a significant indirect effect can exist even in the absence of total effects.

[7] As in Study 1, it is possible that we did not find reliable effects using the difference score approach because of the limitations associated with that approach (see SOM).

Table 7
*Social Class, Desire for Social Rank, and Test of Indirect Effects in Study 2*

| | | | Indirect effect | |
|---|---|---|---|---|
| Class index | Covariates? | Desire for social rank | Using residual scores | Using difference scores |
| Subjective | No | $b = .11$, $t = 4.04^{***}$ | [.23, .87] | [.37, 1.36] |
| | Yes | $b = .07$, $t = 2.72^{**}$ | [.08, .58] | [.09, .78] |
| Income | No | $b = .06$, $t = 2.80^{**}$ | [.12, .58] | [.18, .89] |
| | Yes | $b = .05$, $t = 2.55^{**}$ | [.08, .43] | [.08, .53] |
| Education | No | $b = .17$, $t = 3.54^{***}$ | [.39, 1.61] | [.58, 2.49] |
| | Yes | $b = .16$, $t = 3.60^{***}$ | [.24, 1.24] | [.32, 1.73] |
| Parental | No | $b = .14$, $t = 3.23^{***}$ | [.27, 1.31] | [.43, 1.99] |
| | Yes | $b = .12$, $t = 3.01^{***}$ | [.26, 1.2] | [.32, 1.85] |

$^{**} p < .01$. $^{***} p < .001$.



Third, it showed that, even after controlling for a wide variety of demographic and personality variables, the relationship between social class and overconfidence remained robust, at least when we used the residual score method. And finally, it found strong and consistent evidence for the underlying mechanism across all forms of social class, and across different ways of computing overplacement (i.e., residual scores vs. difference scores).

We also note that a positive feature of Studies 1 and 2 is that they test the relationship between social class and overplacement using tasks that have high external validity. For example, Study 1 uses an actual task that loan officers actually administer as part of their evaluation process, while Study 2 uses a task that employers use to screen potential employees. Thus, these findings have high ecological validity. We do note, however, that it is possible that these tasks may also be biased toward high-socioeconomic-status participants (SES) participants, and that the high-stakes nature of these settings may have elicited "identity threat" for individuals from disadvantaged backgrounds (e.g., Croizet & Claire, 1998). To the extent that this were true, low-SES individuals may "underperform" and feel "underconfident" about their performance. Consistent with this interpretation, we *do* find some evidence that individuals from high-SES backgrounds have higher performance scores than their lower-SES counterparts in Studies 1 and 2. To address this potential explanation, we conducted a high-powered and preregistered follow-up study that sought to minimize the role of identity threat, using a new task in which participants with high social class would be unlikely to have a performance advantage.

## Study 3: A Nondiagnostic Trivia Game

In Study 3, we doubled our sample size, used a new task to capture overconfidence, took steps to minimize identity threat, and sought to conceptually replicate our findings from Study 2. The design of Study 3 generally mirrored what we did in Study 2, with two key differences. First, as in the previous study, we used a multiwave survey. However, to simplify the design, we split our survey into two (rather than three) parts: At Time 1, we assessed people's social class and desire for social rank, which were embedded in a battery of individual difference measures; then, at Time 2, we measured overconfidence, using a new task. Second, we took steps to minimize identity threat in Study 3 by telling participants that the task that we used to measure overconfidence was not in any way diagnostic of their intellectual ability (Steele & Aronson, 1995).

### Method

**Participants.** We preregistered our predictions and analysis plan at http://aspredicted.org/blind.php?x=8y9rh4. As outlined in our preregistration, our goal was to have 1,000 (nonstudent) participants who would complete both our Part 1 and Part 2 surveys. To reach this goal, we first advertised a two-part "General Social Survey Study" on MTurk. We told participants that if they chose to participate, they would receive two surveys during the week, each of which would pay out $1.25.

A total of 1,400 participants signed up to participate and completed Part 1. Of these participants, 1,146 indicated that they are not a student, and thus met our eligibility criteria. These participants received an invitation to take Part 2 a few days later. Per our preregistration plan, we terminated data collection once we had 1,000 participants. A logistic regression showed that there were no differences in gender, age, ethnic status, or (subjective and objective) social class between those who did and did not complete both surveys ($ps_{range} = .08$ to .94).

**Procedure.** This study had two phases. We will now describe them.

***Phase 1.*** At Time 1, participants answered a battery of individual difference measures. Specifically, they answered the same four measures that we used in Study 2 to assess desire for social rank: the *prestige motivation* ($\alpha = .92$) *and dominance motivation* ($\alpha = .95$) scales by Cassidy and Lynn (1989), the *desire for advancement scale* by Belmi and Laurin (2016; $\alpha = .98$), and *the desire for social rank* by Anderson, Willer, Kilduff, and Brown (2012; $\alpha = .96$). As in Study 2, and in accordance with our preregistration plan, we standardized all four, averaged them ($\alpha = .93$), and used the composite score in our analyses.

We also measured the Big Five personality traits using the 10-item personality measure (Gosling et al., 2003) and optimism using the revised life orientation test from Study 2 (Scheier et al., 1994; $\alpha = .93$). Participants also reported their gender, ethnicity, whether they were a part-time or a full-time student (0 = *no*, 1 = *yes*), and their social class, using all four measures from Study 2: (a) the ladder measure of subjective social class; (b) their annual family household income; (c) their own highest educational attainment; and, (d) their parents' highest educational attainment.

***Phase 2: Overplacement.*** A few days after completing our Part 1 survey, those who indicated that they were not a student

received an invitation to complete Part 2. After consenting to participate, participants read the following prompt:

> "Thank you for participating in this study. Today, you will take a fun trivia game! This game has 15 questions, but each question has a time limit: You'll have a maximum of 5 seconds to answer each. The game moves quickly, so please make sure that you give this survey your undivided attention for the next few minutes. Even though the game is NOT diagnostic of your intellectual ability, please do your best and try as hard as you can to perform well on the game! When you are ready, please click the next button to start the game! Good luck!"

We adapted these instructions from Steele and Aronson's (1995) seminal work on stereotype threat. We labeled the exercise as a "fun trivia game" and indicated that it was *not* diagnostic of intellectual ability to assuage any concerns or fears of being devalued (Croizet & Claire, 1998). Participants then completed a 15-item game that consisted of general trivia questions that we pooled from various online sources (sample question: [Ascorbic acid is better known as. . .] [a] Vitamin C; [b] Ethanol"; see SOM). As described in our preregistration, we also pretested this task in a pilot study ($N = 248$) and found that individuals with relatively high social class did not do better on this task compared with their lower-class counterparts ($rs$: $-.03$ to $-.08$, $ps_{range} = .20$ to $.60$; in fact, the direction of these pilot correlations suggested that individuals with high social class, if anything, tended to do worse on this task). Thus, in this new task, those with higher social class should have *no* objective performance advantages.

After completing the game, we asked participants, "How well do you think you did on this game compared with other MTurkers taking this task?", which was accompanied by a slider scale (1 = *at the very bottom, worse than all other MTurkers taking this study*; 100 = *at the very top, better than all other MTurkers taking this study*). After providing their self-perceived rank, participants answered an attention check (i.e., "Please click 6 on the scale below"). Then, they were thanked for their time.

## Results

We began by examining our attention check question, and found that 99% of participants correctly answered it. Results were virtually identical when we conducted analyses excluding those who did not pass the attention check ($n = 7$); thus, for the sake of parsimony, we analyzed the entire sample. Table 8 presents means, standard deviations, and zero-order correlations. As can be seen, all forms of social class were again positively associated with self-perceived rank ($rs_{range} = .08$ to $.18$, $ps_{range} < .001$ to $.02$), consistent with previous work on social class and positivity of self-views. It is interesting that higher-status people thought that they did better on this task, particularly because we constructed this exercise so that they should have had no performance advantages. To check whether we met our goal, we examined the zero-order correlations between social class and actual rank. As intended, individuals with relatively high social class did not perform better on this game compared with their lower-class counterparts ($r_{subjective} = -.09$, $p = .004$; $r_{income} = -.09$, $p = .005$; $r_{education} = .00$, $p = .98$, $r_{parental} = -.05$, $p = .10$). In fact, if anything, the direction of these zero-order correlations indicates that those with higher social class tended to do *worse* on this particular exercise compared with their lower-class counterparts.

**Overconfidence.** To test the hypothesis that social class would be positively associated with overconfidence (Hypothesis 1), we followed the same analytical approaches in Studies 1 and 2, which we preregistered in our analysis plan. The results are summarized in Table 9.

As can be seen, there was strong, consistent, and robust support for Hypothesis 1 across all forms of social class *and* across all ways to compute overplacement: This time, regardless of whether we used the residual score approach, the difference score approach, or the joint estimation procedure, we found that individuals with relatively high social class were more overconfident compared with their lower-class counterparts, even when we controlled for demographic and personality variables. Overall, these results provide strong support for Hypothesis 1.

**Desire for social rank.** We next analyzed desire for social rank. We regressed desire for social rank on (mean-centered) social class, without and with covariates. As can be seen in Table 10, we found that across all forms of social class, those with relatively high social class reported a stronger desire for high social rank compared with individuals with relatively low social class, $bs_{range} = .05$ to $.16$, $ts_{range} = 2.98$ to $9.95$, $ps_{range} = <.001$ to $<.01$. These results are consistent with H2 and replicate the findings of Study 2.

To test the hypothesis that desire for social rank would mediate the link between social class and overconfidence, we conducted a mediation analysis with bias-corrected bootstraps (1,000 iterations), treating social class as the independent variable, desire for social rank as the mediator, and overconfidence as the dependent variable. We conducted these analyses 16 times (four measures of social class, two ways of measuring overplacement, with and without covariates). These results are summarized in Table 10. As can be seen in that table, the desire for social rank emerged as a reliable mediator: Regardless of whether overconfidence was operationalized in terms of residual scores or difference scores, all confidence intervals excluded zero, in both basic and robustness tests, and across all measures of social class. These results provide strong support for Hypothesis 2.

## Discussion

Study 3 was a preregistered study and revealed at least four important findings. First, we replicated our findings from the first two studies and found significant relationships between social class and overplacement. This time, however, we found that the three different approaches for estimating overplacement converged on the same conclusion: Regardless of whether we used the residual score approach, the difference score approach, or the joint estimation procedure, we found that individuals with relatively high social class were more overconfident compared with their lower-class counterparts.

Second, we found that the relationship between social class and overplacement was not only robust, it emerged even in a task in which higher-class individuals did not have performance advantages. In Study 3, we developed and used a new task in which individuals with high social class had no performance advantages, and found that they continued to exhibit the overconfidence that we documented in Studies 1 and 2.

Third, we took careful steps to minimize identity threat in Study 3, and found that the relationship between social class and over-

Table 8
*Descriptive Statistics and Zero-Order Correlations of Study 3 Variables*

| Variable | Mean | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Race | — | — | | | | | | | | | | | | | | | | | | | | |
| 2. Gender | — | — | −.03 | | | | | | | | | | | | | | | | | | | |
| 3. Subjective | 4.58 | 1.69 | −.06 | .01 | | | | | | | | | | | | | | | | | | |
| 4. Income | 3.63 | 2.41 | −.05 | .02 | .54 | | | | | | | | | | | | | | | | | |
| 5. Education | 3.63 | .90 | −.03 | −.04 | .41 | .26 | | | | | | | | | | | | | | | | |
| 6. Parental | 2.94 | 1.07 | .03 | .02 | .23 | .19 | .33 | | | | | | | | | | | | | | | |
| 7. Openness | 5.03 | 1.41 | .03 | −.03 | −.09 | −.11 | −.05 | .03 | | | | | | | | | | | | | | |
| 8. Conscientiousness | 5.53 | 1.21 | .06 | −.04 | .05 | .02 | .05 | −.03 | .20 | | | | | | | | | | | | | |
| 9. Extraversion | 3.56 | 1.67 | .00 | .00 | .21 | .14 | .12 | .03 | .17 | .21 | | | | | | | | | | | | |
| 10. Agreeableness | 4.68 | 1.38 | −.07 | −.09 | .07 | .05 | .06 | .04 | .10 | .22 | .24 | | | | | | | | | | | |
| 11. Neuroticism | 4.62 | 1.66 | −.03 | .22 | .19 | .12 | .08 | .02 | .10 | .40 | .39 | .30 | | | | | | | | | | |
| 12. Optimism | 4.67 | 1.54 | .00 | .00 | .25 | .15 | .09 | .04 | .12 | .38 | .41 | .38 | .59 | | | | | | | | | |
| 13. Status Motive Scale | 3.36 | 1.76 | −.14 | .17 | .27 | .20 | .11 | .11 | −.01 | .04 | .32 | −.06 | .15 | .15 | | | | | | | | |
| 14. Dominance Motivation | 4.26 | 1.58 | −.07 | .17 | .28 | .22 | .14 | .08 | .10 | .18 | .47 | −.01 | .35 | .29 | .67 | | | | | | | |
| 15. Prestige Motivation | 4.25 | 1.42 | −.09 | .16 | .28 | .19 | .11 | .09 | .09 | .10 | .47 | .04 | .26 | .27 | .78 | .80 | | | | | | |
| 16. Desire for Advancement | 3.85 | 1.77 | −.15 | .24 | .26 | .19 | .12 | .08 | .03 | .11 | .40 | .00 | .28 | .21 | .76 | .84 | .82 | | | | | |
| 17. Status Motive Composite | .00 | .91 | −.12 | .20 | .30 | .22 | .13 | .10 | .06 | .12 | .46 | −.01 | .29 | .25 | .88 | .91 | .93 | .94 | | | | |
| 18. Perceived Rank | 49.16 | 21.85 | .02 | .23 | .18 | .08 | .13 | .10 | .12 | .04 | .19 | −.07 | .15 | .13 | .23 | .27 | .24 | .25 | .27 | | | |
| 19. Actual Rank | 50.81 | 28.18 | .07 | −.03 | −.09 | −.09 | .00 | −.05 | .03 | −.04 | −.10 | −.04 | −.10 | −.01 | −.09 | −.11 | −.09 | −.10 | −.11 | .05 | | |
| 20. Residual Scores | .00 | 21.82 | .01 | .23 | .18 | .08 | .13 | .10 | .12 | .04 | .20 | −.07 | .15 | .13 | .24 | .27 | .24 | .25 | .27 | 1.00 | .00 | |
| 21. Difference Scores | −1.64 | 34.77 | −.05 | .17 | .18 | .12 | .08 | .11 | .05 | .06 | .21 | −.01 | .17 | .09 | .22 | .25 | .22 | .24 | .25 | .59 | −.78 | .63 |

*Note*. Given our sample size, correlations of .06 or higher are significant at $p < .05$; correlations of .09 or higher are significant at $p < .01$; correlations of .11 or higher are significant at $p < .001$.

Table 9
*Summary of Key Results in Study 3*

| Class index | Covariate | Perceived rank (P) | Actual rank (A) | Test of overconfidence: Residual score approach | Test of overconfidence: Difference score approach | Test of overconfidence: Joint testing approach |
|---|---|---|---|---|---|---|
| Subjective | No | $b = 2.27$, $t = 5.62^{***}$ | $b = -1.53$, $t = -2.90^{**}$ | $b = 2.33$, $t = 5.78^{***}$ | $b = 3.79$, $t = 5.92^{***}$ | P > A, $\Lambda = .97$, $F = 35.08^{***}$ |
| | Yes | $b = 1.90$, $t = 4.70^{***}$ | $b = -1.21$, $t = -2.19^{*}$ | $b = 1.94$, $t = 4.83^{***}$ | $b = 3.10$, $t = 4.73^{***}$ | P > A, $\Lambda = 1$, $F = 22.39^{***}$ |
| Income | No | $b = .68$, $t = 2.38^{*}$ | $b = -1.04$, $t = -2.82^{**}$ | $b = .72$, $t = 2.53^{**}$ | $b = 1.72$, $t = 3.80^{***}$ | P > A, $\Lambda = .99$, $F = 14.41^{***}$ |
| | Yes | $b = .49$, $t = 1.77^{\dagger}$ | $b = -.82$, $t = -2.19^{*}$ | $b = .53$, $t = 1.89^{\dagger}$ | $b = 1.32$, $t = 2.92^{**}$ | P > A, $\Lambda = .99$, $F = 8.54^{**}$ |
| Education | No | $b = 3.05$, $t = 4.02^{***}$ | $b = -.03$, $t = -.03$ | $b = 3.05$, $t = 4.02^{***}$ | $b = 3.08$, $t = 2.54^{*}$ | P > A, $\Lambda = .99$, $F = 6.44^{*}$ |
| | Yes | $b = 2.98$, $t = 4.12^{***}$ | $b = .56$, $t = .57$ | $b = 2.96$, $t = 4.10^{***}$ | $b = 2.42$, $t = 2.05^{*}$ | P > A, $\Lambda = 1$, $F = 4.19^{*}$ |
| Parental | No | $b = 2.08$, $t = 3.23^{**}$ | $b = -1.38$, $t = -1.65^{\dagger}$ | $b = 2.14$, $t = 3.32^{***}$ | $b = 3.46$, $t = 3.38^{***}$ | P > A, $\Lambda = .99$, $F = 11.41^{***}$ |
| | Yes | $b = 1.86$, $t = 3.05^{**}$ | $b = -1.45$, $t = -1.75^{\dagger}$ | $b = 1.92$, $t = 3.15^{**}$ | $b = 3.31$, $t = 3.34^{***}$ | P > A, $\Lambda = .99$, $F = 11.18^{***}$ |

*Note*. In the robustness test for income using the residual score approach, the exact $p$ value is .058.
$^{\dagger} p < .10$. $^{*} p < .05$. $^{**} p < .01$. $^{***} p < .001$.

placement continued to emerge, even when we described the task as nondiagnostic of intellectual ability.

And finally, we again found evidence for our proposed mechanism regarding the underlying link between social class and overconfidence. Specifically, Study 3 showed that compared with participants with relatively low social class, participants with relatively high social class had a stronger desire for social rank, which, in turn, was associated with more overconfidence. This indirect effect emerged across all forms of social class and was robust *regardless* of whether we used residual scores or difference scores. On the whole, the results of this high-powered, multiwave, and preregistered study support the idea that social class is systematically linked to overconfidence.

## Study 4: Overconfidence Provides Individuals With High Social Class

### A Path to Social Advantage

Our final study tested the idea that that the overconfidence of high-class individuals would provide them a path to social advantage. Specifically, we hypothesized that compared with their lower-class counterparts, individuals with relatively high social class would be more overconfident, which, in turn, would make them seem more competent (Hypothesis 3) and therefore more deserving of high social rank (Hypothesis 4) in the eyes of independent observers. To test this idea, we conducted a multiphase study. In Phase 1, we recruited university students to come to the lab to complete an intake survey that measured their personality, overconfidence, and demographic characteristics. A week later, in Phase 2, we invited these students to come back to the lab for a "mock hiring interview." Here, participants had to role-play as a job applicant and give a speech on how they would handle a difficult situation. We videotaped these performances. Finally, in Phase 3, we recruited independent judges to evaluate the performance of these students. We predicted that compared with students with relatively low social class, students with relatively high social class were more overconfident; this overconfidence, in turn, would help them appear more competent and ultimately more hirable in the eyes of independent evaluators.

### Method

**Participants.** Sample size for this study was determined based on the size of the available subject pool. We attempted to recruit as many students as we could over the course of one semester for a two-part study on "General Attitudes and Personality." Two hundred and seventy-nine from a southern university signed up for our study and completed Part 1 in the lab for $9. A week later, 237 of these students (85%) came back to complete Part 2 for an additional $16. A logistic regression showed that there were no differences in gender, ethnic status, and (objective and subjective) social class between those who did and did not complete both phases of the study, $p$s = .11 to .91. To maximize our statistical

Table 10
*Social Class, Desire for Social Rank, and Test of Indirect Effects in Study 2*

| Class index | Covariates? | Desire for social rank | Indirect effect: Using residual scores | Indirect effect: Using difference scores |
|---|---|---|---|---|
| Subjective | No | $b = .16$, $t = 9.95^{***}$ | [.67, 1.31] | [.92, 1.89] |
| | Yes | $b = .11$, $t = 7.04^{***}$ | [.16, .57] | [.19, .87] |
| Income | No | $b = .08$, $t = 7.13^{***}$ | [.37, .78] | [.51, 1.07] |
| | Yes | $b = .05$, $t = 5.27^{***}$ | [.11, .36] | [.14, .5] |
| Education | No | $b = .13$, $t = 4.2^{***}$ | [.4, 1.37] | [.61, 2.1] |
| | Yes | $b = .08$, $t = 2.98^{**}$ | [.09, .63] | [.14, .99] |
| Parental | No | $b = .08$, $t = 3.14^{**}$ | [.19, .95] | [.3, 1.4] |
| | Yes | $b = .08$, $t = 3.32^{***}$ | [.08, .62] | [.16, 1.01] |

$^{**} p < .01$. $^{***} p < .001$.

power, we analyzed all the data that we have (results were virtually identical when we analyzed data only from participants who completed both parts).

**Procedure.** This study had three phases; we describe them below.

***Phase 1.*** We invited participants to come to the lab to complete an intake survey that contained a battery of measures. They first answered the same personality measures from Studies 2 and 3 (i.e., optimism, SDO, and the Big Five personality test). Then, they answered the same 15-item trivia exercise that we used in Study 3. We then asked participants how well they think they did, relative to other study participants (1 = *at the very bottom, worse than all other students taking this study*; 100 = *at the very top, better than all other students taking this study*).

Next, participants answered a demographic questionnaire, which contained three measures of social class from Studies 2 and 3: (a) the ladder measure of subjective social class; (b) the participants' annual family household income; and (c) their parents' educational attainment. We did not measure our participants' highest educational attainment because they were all college students at the time of the study.

***Phase 2.*** A week later we invited these undergraduate students to come back to the lab for a "mock hiring interview." To enhance the study's experimental realism, we instructed participants to come in business casual clothes appropriate for an interview.

When participants arrived, a research assistant greeted them and led them to their individual rooms. The research assistant handed the participant a document outlining an overview of what they would do. The research assistant then left the room to give the participant a few minutes to read the document.

Participants read that the study was about hiring situations. We asked participants to imagine that after college, they were applying for a regional manager position for the mobile and smartphone division at Samsung, a job that would come with competitive and prestigious benefits. We told participants to envision the job as something that they really want. Participants further read that if they are successful in getting the job, they would handle the marketing of Samsung's upcoming flagship phone, the "Note 8" (at the time the study was run, there was no "Note 8"). We told participants that Samsung had a history of producing excellent mobile phones, but faced a serious crisis in 2016 when its flagship phone faced a massive recall.

After providing participants with this context, we described the focal task. Specifically, participants read the following:

> "As is standard in many companies, part of your application involves an interview with the selection committee. The selection committee would like to see how you would handle situations that you may encounter if you get this job. Specifically, imagine that you are at a media event for the Note 8, and you are answering questions from the media and the press at the end of your keynote presentation. One of the members of the press asks you the following: *There are survey reports online indicating that about 40% of current Samsung customers are saying that they won't buy another Samsung phone, causing many analysts to speculate that Samsung has lost investor and public trust. What are your comments on that?"*

Participants read that they had 5 minutes to think about their response and that after that time period, they would be asked to deliver it. We provided participants with pen and paper to help them prepare. Participants also read that they should take their role seriously: "When you deliver your response, you should place yourself in your role, and deliver your response as how you actually would if you were in that situation." To bolster motivation, we told participants that their performance will be videotaped and viewed by an actual committee, and that the participant with the best performance will win a $100 gift card.

After 5 minutes, the research assistant came back to the room and brought the participant to another room to videotape the participant. The participant stood in front of the camera, and the research assistant repeated the question that was posed to the participant. Then, the research assistant started the video recording and the participant delivered their speech. To recreate the stressfulness of this situation in the real world, we used a methodology adapted from Cuddy, Wilmuth, Yap, and Carney (2015) and instructed the research assistant to display flat affect throughout the participant's speech. By refraining from giving any encouraging nonverbal responses (e.g., smiling, head nods), the research assistant deprived participants of real-time feedback, making this task particularly challenging. When the participant finished, the research assistant stopped the recording and thanked the participant. Due to a technical malfunction, one video failed to record, leaving us with a total of 236 videos.

***Phase 3.*** In Phase 3, we uploaded the video recordings to allow online viewing. Based on previous methodologies and balancing costs, we targeted to recruit at least 944 individuals from MTurk so that approximately four independent raters would watch each video (in total, we received 951). We first gave these independent judges a brief description of the task that our undergraduate participants from Phase 2 undertook; then we asked them to assume that they were a member of the selection committee who would make a decision about applicants. Each judge then watched one randomly assigned video from our pool of 236 videos. They received no other information about the applicant.

After watching the video, judges rated their impressions of the applicant by answering measures adapted from existing scales (Fiske, Cuddy, Glick, & Xu, 2002; Goodwin, Piazza, & Rozin, 2014; Schroeder & Epley, 2015) using a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*) to answer each. First, they rated the applicant's competence by indicating whether they thought that the applicant was "capable," "competent," "thoughtful," "insightful," and "qualified" ($\alpha = .95$). Second, judges indicated their impressions of the applicant's morality (i.e., whether they thought the applicant seemed "moral," "principled," "honest," and "trustworthy"; $\alpha = .92$). We measured it to rule out the alternative explanation that judges would favor an applicant with relatively high social class because they are typically seen as more trustworthy than low-status individuals (e.g., Fiske et al., 2002). Third, judges rated the applicant's warmth (i.e., whether they thought the applicant was "warm," "friendly," "sociable," and "extroverted"; $\alpha = .87$). Although much of the existing theories in social psychology propose that higher social class is associated with lower perceived warmth (Cuddy, Fiske, & Glick, 2007; Durante, Tablante, & Fiske, 2017; Fiske et al., 2002; Kraus et al., 2012), some research suggests that there are circumstances in which high-status people may be seen as warmer than their lower-status counterparts (e.g., Leslie, Mayer, & Kravitz, 2014). Therefore, we measured warmth to investigate and rule out this possibility. A factor analysis with oblimin rotation showed three distinct

Table 11
*Descriptive Statistics and Zero-Order Correlations of Study 4 Variables*

| Variable | Mean | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Race | | | | | | | | | | | | | | | | | |
| 2. Gender | | | −.03 | | | | | | | | | | | | | | |
| 3. Subjective | 6.62 | 1.39 | .26 | −.02 | | | | | | | | | | | | | |
| 4. Family income | 7.79 | 4.14 | .19 | −.08 | .58 | | | | | | | | | | | | |
| 5. Parental | 4.14 | .82 | .18 | −.03 | .47 | .45 | | | | | | | | | | | |
| 6. Openness | 4.93 | 1.24 | .07 | −.09 | .05 | .01 | .05 | | | | | | | | | | |
| 7. Conscientiousness | 5.01 | 1.07 | .23 | −.15 | .16 | .08 | .03 | .15 | | | | | | | | | |
| 8. Extraversion | 4.42 | 1.38 | .06 | .05 | .12 | .07 | −.01 | .16 | .24 | | | | | | | | |
| 9. Agreeableness | 4.47 | 1.17 | −.04 | .07 | −.01 | −.12 | −.10 | .03 | .14 | .06 | | | | | | | |
| 10. Neuroticism | 3.92 | 1.36 | −.02 | .26 | .08 | .06 | .00 | .09 | .13 | .20 | .09 | | | | | | |
| 11. Optimism | 4.47 | 1.47 | −.09 | .05 | −.01 | .01 | −.07 | .10 | .15 | .06 | .25 | .38 | | | | | |
| 12. SDO | 3.11 | 1.03 | −.10 | .03 | .10 | .06 | −.04 | −.11 | .00 | −.03 | −.06 | .03 | .05 | | | | |
| 13. Perceived Rank | 53.31 | 18.63 | .11 | .27 | .25 | .22 | .21 | .13 | .17 | .15 | −.01 | .25 | .17 | −.01 | | | |
| 14. Actual Rank | 50.75 | 27.97 | .08 | .01 | −.10 | −.11 | −.07 | .01 | −.05 | −.09 | −.03 | −.02 | .01 | −.01 | .08 | | |
| 15. Residual Scores | .00 | 18.57 | .10 | .27 | .26 | .23 | .22 | .13 | .17 | .15 | −.01 | .25 | .17 | .00 | 1.00 | .00 | |
| 16. Difference Scores | 2.72 | 32.30 | −.01 | .14 | .23 | .22 | .18 | .07 | .14 | .16 | .01 | .16 | .09 | .00 | .51 | −.82 | .57 |

*Note*. Given our sample size, correlations of .12 or higher are significant at $p < .05$; correlations of .16 or higher are significant at $p < .01$; correlations of .21 or higher are significant at $p < .001$.

factors explaining 75% of the total variance, with items loading as theoretically intended (loadings >.60).

Next, judges indicated how strongly they favored hiring the applicant. They did so by rating their agreement with two statements: "I would support the hiring of this candidate" and "I would endorse the hiring of this candidate." We averaged these items, $r = .96$, $p < .001$. After answering these measures, our MTurk judges completed a demographic questionnaire and were paid $2.00 for participating.

Finally, in addition to our MTurk judges, we sought the help of two independent coders. Because some research suggests that higher-class individuals may be viewed as more physically attractive than lower-class individuals (Belmi & Neale, 2014; Bjornsdottir & Rule, 2017), we wanted to rule out the alternative explanation that individuals with relatively high social class would attain more favorable ratings simply because they are more attractive. To this end, we asked two coders to watch each video and rate whether the applicant was attractive (1 = *not at all*, 2 = *somewhat*, 3 = *very*). Their ratings correlated highly ($r = .63$, $p < .001$) so we averaged their responses and controlled for the applicant's attractiveness in all of our robustness tests.

## Results

Degrees of freedom vary slightly because a few participants did not answer some questions.[8] They were automatically excluded listwise when appropriate. Means, standard deviations, and zero-order correlations for Study 4 are presented in Table 11. As can be seen, all forms of social class were again positively associated with self-perceived rank (*r*s = .21 to .25, all *p*s < .001). Objectively, however, they did not do better than their lower-class counterparts ($r_{subjective} = -.10$, $p = .08$; $r_{income} = -.11$, $p = .06$; $r_{parental} = -.07$, $p = .26$). These results are consistent with what we found in Study 3.

**Overconfidence.** To test the hypothesis that social class would be positively associated with overconfidence (Hypothesis 1), we followed the same analytical approaches in our first three studies. The results are summarized in Table 12.

As can be seen, there was strong and consistent support for Hypothesis 1: Individuals with relatively high social class were more overconfident compared with their lower-class counterparts. This finding emerged across all forms of social class and across all analytical approaches for computing overplacement, and was robust when we included covariates in the model, $bs_{range} = 1.00$ to 8.32, $ts_{range} = 2.86$ to 4.39, $ps_{range} = < .001$ to .01.

**Social class and perceived competence.** Hypothesis 3 states that differences in overconfidence, driven by differences in people's social class, would predict perceptions of competence in the eyes of independent observers. To examine this hypothesis, we first conducted linear mixed model analyses, predicting competence ratings from social class as a fixed effect and subject as a random effect. We conducted this analysis six times (three measures of social class, without and with covariates). We found that individuals with relatively high subjective social class were rated as significantly more competent than their lower-class counterparts (without covariates: $b = .10$, $t[231.96] = 2.46$, $p = .015$; with covariates: $b = .09$, $t[218.74] = 1.95$, $p = .052$). Furthermore, there was some evidence that those from higher-income families (without covariates: $b = .01$, $t[233.32] = 1.05$, $p = .30$; with covariates: $b = .01$, $t[222.14] = .96$, $p = .34$) and those with more educated parents (without covariates: $b = .11$, $t[236.14] = 1.49$, $p = .14$; with covariates: $b = .09$, $t[223.00] = 1.23$, $p = .22$) were rated as directionally more competent than their lower-status counterparts, but, unexpectedly, these effects did not reach traditional levels of significance.

Next, we tested whether social class was associated with perceived competence via overconfidence (Hayes, 2017). We first computed a competence score for each participant; then we estimated indirect effects with bias-corrected bootstraps (1,000 iterations) in which social class was the independent variable, overconfidence was the mediator, and competence was the dependent

[8] These participants did not answer our question on parental education ($n = 1$), parental income ($n = 7$), SDO ($n = 1$), gender ($n = 1$), ethnic status ($n = 3$), and self-perceived performance on the test ($n = 1$).

Table 12
*Summary of Key Results in Study 4*

| Class index | Covariate | Perceived rank (P) | Actual rank (A) | Test of overconfidence: Residual score approach | Test of overconfidence: Difference score approach | Test of overconfidence: Joint testing approach |
|---|---|---|---|---|---|---|
| Subjective | No | $b = 3.31$, $t = 4.24^{***}$ | $b = -2.09$, $t = -1.74^{\dagger}$ | $b = 3.41$, $t = 4.39^{***}$ | $b = 5.26$, $t = 3.86^{***}$ | P > A, $\Lambda = .95$, $F = 14.93^{***}$ |
| | Yes | $b = 2.53$, $t = 2.89^{**}$ | $b = -2.33$, $t = -1.57$ | $b = 2.65$, $t = 3.03^{**}$ | $b = 4.72$, $t = 2.86^{**}$ | P > A, $\Lambda = 1$, $F = 8.21^{**}$ |
| Income | No | $b = .97$, $t = 3.65^{***}$ | $b = -.76$, $t = -1.85^{\dagger}$ | $b = 1.01$, $t = 3.81^{***}$ | $b = 1.71$, $t = 3.68^{***}$ | P > A, $\Lambda = .95$, $F = 13.52^{***}$ |
| | Yes | $b = .97$, $t = 3.43^{***}$ | $b = -.63$, $t = -1.28$ | $b = 1.00$, $t = 3.56^{***}$ | $b = 1.57$, $t = 2.92^{**}$ | P > A, $\Lambda = .96$, $F = 8.54^{**}$ |
| Parental | No | $b = 4.83$, $t = 3.62^{***}$ | $b = -2.3$, $t = -1.13$ | $b = 4.94$, $t = 3.72^{***}$ | $b = 7.09$, $t = 3.04^{**}$ | P > A, $\Lambda = .97$, $F = 9.24^{**}$ |
| | Yes | $b = 3.84$, $t = 2.77^{**}$ | $b = -4.51$, $t = -1.93^{\dagger}$ | $b = 4.07$, $t = 2.95^{**}$ | $b = 8.32$, $t = 3.22^{**}$ | P > A, $\Lambda = .96$, $F = 10.35^{**}$ |

$^{\dagger} p < .10$. $^{*} p < .05$. $^{**} p < .01$. $^{***} p < .001$.



variable. We conducted this analysis 12 times (two ways of computing overconfidence, three measures of social class, each with and without covariates). As Table 13 shows, the indirect effect was significant (or marginally significant) in 11 (out of 12) cases, and these indirect effects were more robust across all measures of social class in analyses using residual scores (vs. difference scores).[9]

**Social class, perceived competence, and status attainment.** Hypothesis predicted that relative to individuals with lower social class, individuals with relatively high social class would be more overconfident, which in turn, would be associated with higher competence ratings, and ultimately, higher hiring ratings. To examine this hypothesis, we first examined the relationship between social class and hiring ratings, using linear mixed model analyses described above. We found some evidence that individuals with relatively high subjective social class were rated as significantly more hireable than their lower-class counterparts (without covariates: $b = .11$, $t[230.46] = 2.26$, $p = .025$), although this relationship fell just below traditional levels of significance when we included robust controls (with covariates: $b = .09$, $t[218.30] = 1.73$, $p = .08$). And mirroring the preceding analysis on competence, there was some evidence that those from higher-income families (without covariates: $b = .02$, $t[233.22] = 1.29$, $p = .20$; with covariates: $b = .02$, $t[222.92] = 1.21$, $p = .23$) and those with more educated parents (without covariates: $b = .11$, $t[235.51] = 1.37$, $p = .17$; with covariates: $b = .10$, $t[223.10] = 1.15$, $p = .25$) were rated as directionally more hireable than their lower-status counterparts, but these effects also did not reach traditional levels of significance.

Next, we tested whether higher social class was associated with higher hiring ratings through a two-stage indirect process of overconfidence and perceived competence (Hayes, 2009). First, we computed a hiring score for each participant; then we estimated indirect effects with bias-corrected bootstraps (1,000 iterations) in which social class was the independent variable, hiring rating was the dependent variable, and overconfidence and perceived competence were sequential mediators. We conducted this analysis twelve times and the results are summarized in Table 13. As Table 13 shows, in all cases, the tests for sequential mediation were either significant or marginally significant, and these indirect effects were more robust across all measures of social class in analyses using residual scores (vs. difference scores). This provides strong support for our sequential mediation hypothesis (see Figure 1).

**Alternative explanations.** Next, we sought to examine two alternative explanations. First, it is possible that compared with individuals with relatively low social class, individuals with relatively high social class might appear more warm and moral, which, in turn, could increase their likelihood of being conferred with higher social rank. To investigate these possibilities, we ran separate linear mixed-model regressions, predicting warmth and morality ratings made by independent judges on social class (both with and without covariates as fixed effects, and subject as a random effect). These analyses involved 12 separate models (two dependent variables, three measures of social class, both with and without covariates). All 12 models yielded nonsignificant results ($b$s $= -.00$ to .05, $t$s $= -.04$ to 1.40, $p$s $= .16$ to .97). Thus, independent judges perceived individuals with relatively high social class to be just as warm and moral as individuals with relatively low social class.

Second, an alternative theoretical model suggests that individuals with relatively high social class were able to attain stronger hiring ratings because they are, in fact, more competent (in our trivia test) than their lower-status counterparts. However, the data do not appear to support this interpretation. As noted earlier,

[9] We also conducted additional analyses to verify that overconfidence *does* cause greater perceptions of competence (Anderson, Brion et al., 2012). Specifically, we analyzed our data using response surface analysis (Edwards, 1995; Edwards & Parry, 1993), a comprehensive analytical tool that was specifically designed to test how matches and mismatches matter. We used the RSA package in R and ran a polynomial regression model in which we regressed competence ratings on perceived rank (our X predictor), actual rank (our Y predictor), their squared terms, and their interaction term. The full polynomial model was significant, $R^2 = .056$, $p = .02$. We then examined the three-dimensional response surface and the tests of its shape. There was a positive $a_3$ slope, estimate = .01, se = .003, (.002, .016), $p = .004$. A positive $a_3$ slope suggests that "the outcome is higher when the X (predictor) is higher than the Y (predictor) than when the Y (predictor) is higher than the X (predictor)" (Barranti, Carlson, & Côté, 2017). Applied to our case, this suggests that people appeared more competent when their perception of their rank exceeds their actual rank than vice versa. In other words, the results of the response surface analysis do replicate and confirm previous findings in the literature (Anderson, Brion, et al., 2012) that overconfidence is indeed associated with greater perceptions of competence in the eyes of observers.

Table 13
*Test of Indirect Effects in Study 4*

| | | Test of H3 | | Test of H4 | |
|---|---|---|---|---|---|
| | | Class → Overconfidence → Competence | | Class → Overconfidence → Competence → Hiring | |
| Class Index | Covariates? | Using residual scores | Using difference scores | Using residual scores | Using difference scores |
| Subjective | No | [.01, .06] | [−.001, .04][a] | [.01, .07] | [−.001, .04][a] |
| | Yes | [.01, .06] | [.002, .04] | [.01, .07] | [.001, .04] |
| Income | No | [.002, .02] | [−.001, .01] | [.003, .02] | [−.001, .01][a] |
| | Yes | [.003, .02] | [−.001, .01][a] | [.003, .02] | [−.001, .01][a] |
| Parental | No | [.01, .08] | [.001, .07] | [.02, .10] | [.001, .07] |
| | Yes | [.01, .10] | [.002, .08] | [.02, .11] | [−.001, .08][a] |

*Note*. Confidence intervals marked with [a] are significant at 90% CI (that is, the confidence intervals exclude zero at 90% CI).

individuals with relatively high social class were no better at our trivia test than individuals with relatively low social class.[10]

## Discussion

In Study 4, we conducted a multiphase study among university students and found at least two important findings. First, consistent with Hypothesis 1, we found that individuals with relatively high social class were more overconfident compared with their lower-class counterparts, a relationship that emerged across all measures of social class, across all ways of analyzing overplacement, and even after controlling for a wide variety of demographic and individual difference variables. Second, and consistent with Hypothesis 3 and Hypothesis 4, we found that their overconfidence provided a path to social advantage, at least through an indirect process: Individuals with relatively high social class were more overconfident, which, in turn, was associated with being perceived as more competent, and, ultimately, more hireable in the eyes of independent observers (even though, on average, they were no better at the trivia test compared with their lower-class counterparts). We also found evidence for our status-conferral hypothesis, even after accounting for alternative mechanisms (e.g., attractiveness, personality). Taken together, the findings of Study 4 show an important downstream consequence of the class and overconfidence link and help illuminate an additional mechanism on how class hierarchies may perpetuate.

Although we found evidence for our proposed indirect effects, we also note that the direct effects of social class on our ultimate dependent variables (i.e., perceived competence and hiring ratings) were, unexpectedly, less reliable than what we had hoped, particularly in the case of objective social class. In all cases, the effects of income and education on our ultimate dependent variables were directionally consistent with our expectations, but they did not achieve traditional levels of significance. We speculate on several possible reasons for this. First, it is possible that we did not have sufficient statistical power to detect these effects; as many methodologists have noted, the effect of an IV (independent variable) on a DV (dependent variable) becomes harder to detect as the proposed process becomes more distal (Hayes, 2018; Kenny & Judd, 2014; Shrout & Bolger, 2002). Second, it is possible that these null results may, in part, be attributable to the characteristics of our sample. Our participants were students attending an elite public university; their parents' educations and their family incomes were on the higher end of the spectrum (see Table 4). It is possible that we would have been more successful at detecting these effects if we had used a sample with wider-ranging family incomes and parental education. Third, it is possible that these direct effects are being suppressed by unmeasured variables. For example, it is possible that more overconfident participants were perceived as more arrogant (Murphy et al., 2015), which, in turn, lowered their desirability to independent evaluators. And finally, it is possible that these null results may, in part, be attributable to the characteristics of our research design. Unlike previous studies in which observers were asked to make evaluations about targets whose social class was made explicit or known (e.g., Darley & Gross, 1983), we did not give our independent evaluators any information about the applicants' social class. Therefore, it is possible that the direct effects of social class on our ultimate dependent variables was weak because the social class of our participants was not readily visible or inferable to outside observers.

## Internal Meta-Analysis

To further investigate the relationship between social class and overconfidence, we conducted several internal meta-analyses, using each index of social class separately (see Tables 14 and 15). We used correlation coefficients as our effect size and conducted separate analyses for zero-order correlations and partial correlations obtained from regressions with covariates. Because we tested our hypotheses using different tasks, popu-

[10] We also examined whether performance or overconfidence was a stronger predictor of perceptions of competence. To answer this question, we conducted a standard OLS regression, regressing perceived competence on test performance and overconfidence simultaneously. We conducted this analysis twice (once using residual scores of overconfidence, and once using difference scores). In both cases, we found that overconfidence more strongly predicted perceptions of competence (residual score model: $b_{\text{overconfidence}} = .01$, $t[232]_{\text{overconfidence}} = 3.14$, $p_{\text{overconfidence}} = .002$; difference score model: $b_{\text{overconfidence}} = .01$ $t[232]_{\text{overconfidence}} = 3.29$, $p_{\text{overconfidence}} = .001$) than did actual competence (residual score model: $b_{\text{testperformance}} = .00$, $t_{\text{testperformance}}$ [232] = −.02, $p_{\text{testperformance}} = .99$; difference score model: $b_{\text{testperformance}} = .13$, $t[232]_{\text{testperformance}} = 2.64$, $p_{\text{testperformance}} = .01$).

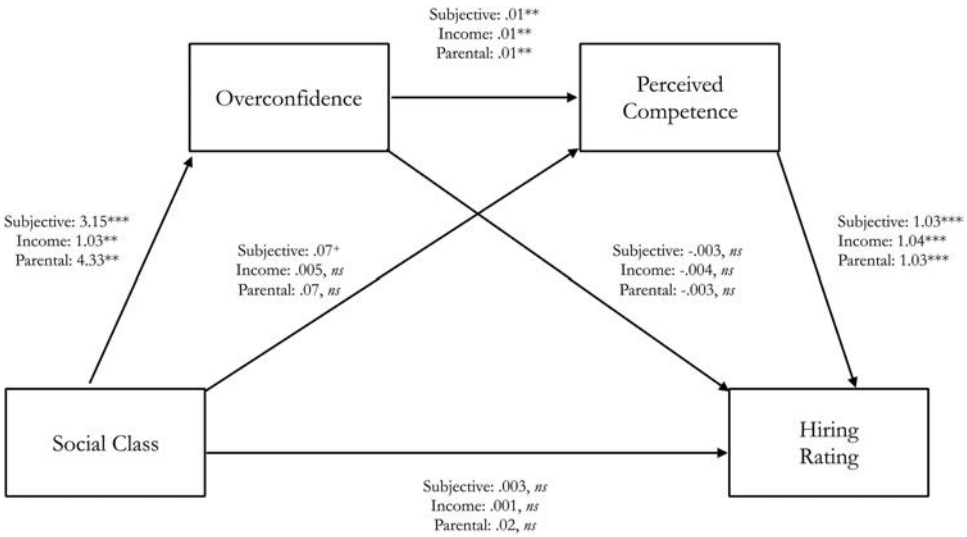


*Figure 1.* Sequential mediation model analysis in Study 4. Values indicate the point estimates of the focal predictor when a specific operationalization of social class is used in the regression model. For parsimony purposes, the values that appear in this figure were derived from basic regression models in which residual scores were used and no covariates were included. $^{+}$ $p < .10$. $^{*}$ $p < .05$. $^{**}$ $p < .01$. and $^{***}$ $p < .001$.

lations, and settings, we conducted all meta-analyses using a random effects model. All meta-analytic tests were conducted using the *metafor* package in R (Viechtbauer, 2010), and following scholarly recommendations (Vevea & Coburn, 2015), we used restricted maximum likelihood (REML) as our variance estimator.

In the first set of meta-analyses that involved residual scores, there was strong and robust support for Hypothesis 1: We found highly significant and robust relationships between social class and overconfidence, whether we operationalized social class as subjective rank (*p*s <.001), income (*p*s <.001), education ($p_{basic}$ = .06; $p_{robust}$ = .03), or as parental education (all *p*s <.001). In the second set of meta-analyses that involved difference scores, we found support for Hypothesis 1 only in the case of subjective social class (all *p*s <.01). When overplacement was operationalized using difference scores, none of the objective social class indices showed a reliable relationship with overconfidence (see Table 14).

Because of the limitations associated with discrepancy scores, we also followed scholarly recommendations (Edwards, 1995) and examined the effects of social class on actual rank and perceived rank separately. Specifically, we computed the effects of social class on actual rank and perceived rank in each of our four studies and then subjected these estimates in a third meta-analytic test. As can be seen in Table 15, across all our studies that involved different populations, different tasks, and different settings, there was strong and consistent evidence that individuals with relatively high social class tended to think that they did better than their lower-class counterparts ($rs_{range}$ = .09 to .24, $ps_{range}$ = <.001 to .04), even though objectively, on average, they did not ($rs_{range}$ = −.03 to .06, $ps_{range}$ = .14 to .99).

As Table 15 further shows, social class (in all forms) always had a stronger relationship with perceived rank than with actual rank, and its effect on perceived rank was always positive and significantly different from zero (i.e., the confidence intervals always excluded zero), whereas its effect on actual rank was always nonsignificant and not reliably different from zero. These data are consistent with the conclusions of the residual score approach, and hint at the possibility that the null results that we observed with the difference score approach in some of the studies may be a function of the limitations of that approach.

Furthermore, the meta-analytic tests indicate that there was significant heterogeneity across the studies. This is not *surprising*, and is to be expected, considering that we tested our hypotheses using different populations and different tasks. Given that the "meaning and function of SES may vary substantially across countries" (for a recent discussion, see Miyamoto et al., 2018, p. 428), we also reran these meta-analyses, focusing only on the studies that were conducted within the U.S. population. These results are also summarized in Tables 14 and 15. As can be seen, the meta-analytic tests focusing only on the U.S. studies revealed that *both* the residual score approach and the difference score approach converged on the conclusion that subjective rank ($r_s$ = .12 to .23, *p*s < .001) and income ($r_s$ = .09 to .14, $ps_{range}$ < .001 to .05), were reliably related to overconfidence. Furthermore, when we examined perceived rank and actual rank, we found that across *all* forms of social class, those who had relatively high social class in the U.S. tended to think that they did better than their lower-class counterparts ($rs_{range}$ = .10 to .22, all *p*s < .001), even though objectively, they did not ($rs_{range}$ = −.05 to .09, $ps_{range}$ = .22 to .99). Furthermore, social class (in all forms) always had a stronger relationship with perceived rank than with actual rank, and its effect on perceived rank was always positive and significantly different from zero (i.e., the confidence intervals always excluded zero), whereas its effect on actual rank was always nonsignificant and not reliably different from zero. These results strongly suggest that overconfidence may indeed be more prevalent among higher-SES individuals.

Table 14
*Internal Meta-Analysis Results*

| | Residual Scores | | | | | | | | Difference Scores | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Subjective | | Income | | Education | | Parental | | Subjective | | Income | | Education | | Parental | |
| Study | No Cov. | With Cov. | No Cov. | With Cov. | No Cov. | With Cov. | No Cov. | With Cov. | No Cov. | With Cov. | No Cov. | With Cov. | No Cov. | With Cov. | No Cov. | With Cov. |
| Study 1 | .24 | .24 | .06 | .06 | .01 | .02 | | | .04 | .04 | −.12 | −.13 | −.03 | −.01 | | |
| Study 2 | .27 | .20 | .14 | .11 | .11 | .10 | .10 | .07 | .12 | .05 | .03 | .01 | −.08 | −.08 | −.03 | −.02 |
| Study 3 | .18 | .14 | .08 | .06 | .13 | .12 | .10 | .09 | .18 | .14 | .12 | .09 | .08 | .06 | .11 | .10 |
| Study 4 | .26 | .18 | .23 | .21 | | | .22 | .18 | .23 | .18 | .22 | .19 | | | .18 | .20 |
| Overall | .23 | .20 | .11 | .08 | .08 | .07 | .13 | .10 | .13 | .09 | .06 | .03 | −.01 | −.004 | .08 | .09 |
| 95% CI | [.20, .26] | [.14, .25] | [.04, .18] | [.04, .13] | [−.01, .16] | [.003, .14] | [.06, .19] | [.05, .15] | [.05, .22] | [.03, .16] | [−.09, .20] | [−.10, .17] | [−.09, .08] | [−.07, .06] | [−.03, .20] | [−.03, .20] |
| z value | 14.55*** | 7.09*** | 3.27*** | 3.62*** | 1.84† | 2.05* | 3.84*** | 4.03*** | 3.11*** | 2.77** | .77 | .47 | −.16 | −.12 | 1.44 | 1.49 |
| Cochran's *Q* | 4.41 | 11.92** | 11.91** | 6.65† | 18.70*** | 12.98** | 3.63 | 2.07 | 34.52*** | 15.14** | 102.36*** | 81.69*** | 13.29** | 7.06* | 9.02* | 8.31* |
| $I^2$ | 33.47% | 68.80% | 79.73% | 55.18% | 85.69% | 80.46% | 42.29% | .10% | 87.76% | 77.24% | 95.84% | 94.96% | 87.82% | 79.16% | 80.51% | 79.78% |
| U.S. only | .23 | .16 | .14 | .11 | .12 | .11 | .13 | .10 | .17 | .12 | .12 | .09 | .004 | −.01 | .08 | .09 |
| 95% CI | [.16, .29] | [.11, .21] | [.06, .22] | [.03, .19] | [.07, .18] | [.06, .17] | [.06, .19] | [.05, .15] | [.13, .22] | [.05, .19] | [.02, .22] | [.001, .18] | [−.15, .16] | [−.14, .13] | [−.03, .20] | [−.03, .20] |
| z value | 6.92*** | 6.77*** | 3.28*** | 2.77*** | 4.76*** | 4.37*** | 3.84*** | 4.03*** | 7.41*** | 3.58*** | 2.38* | 1.97* | .05 | −.08 | 1.44 | 1.49 |
| Cochran's *Q* | 3.46 | 1.26 | 5.44† | 4.60† | .12 | .12 | 3.63 | 2.07 | 2.30 | 3.42 | 6.44* | 5.14† | 7.82** | 5.98* | 9.02* | 8.31* |
| $I^2$ | 44.28% | .00% | 63.44% | 57.12% | .00% | .00% | 42.29% | .10% | .19% | 39.74% | 73.20% | 64.65% | 87.21% | 83.27% | 80.51% | 79.78% |

*Note*. In Study 1, parental education was not assessed. In Study 4, all participants were university students. U.S. studies are Studies 2 to 4.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 15
*Internal Meta-Analysis Results*

| | Effects of Class on Perceived and Actual Performance Across Studies | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Subjective | | | | Income | | | | Education | | | | Parental | | | |
| | Without Cov. | | With Cov. | | Without Cov. | | With Cov. | | Without Cov. | | With Cov. | | Without Cov. | | With Cov. | |
| Study | Perceived | Actual | Perceived | Actual | Perceived | Actual | Perceived | Actual | Perceived | Actual | Perceived | Actual | Perceived | Actual | Perceived | Actual |
| Study 1 | .26 | .13 | .26 | .13 | .11 | .20 | .10 | .21 | .02 | .04 | .02 | .03 | | | | |
| Study 2 | .27 | .05 | .21 | .08 | .16 | .07 | .13 | .07 | .16 | .18 | .15 | .17 | .14 | .12 | .09 | .08 |
| Study 3 | .18 | −.09 | .14 | −.07 | .08 | −.09 | .05 | −.07 | .13 | .00 | .12 | .02 | .10 | −.05 | .09 | −.05 |
| Study 4 | .25 | −.10 | .17 | −.10 | .22 | −.11 | .21 | −.09 | | | | | .21 | −.07 | .17 | −.13 |
| Overall | .24 | .00 | .20 | .02 | .11 | .02 | .10 | .04 | .10 | .07 | .09 | .06 | .14 | .00 | .10 | −.03 |
| 95% CI | [.20, .28] | [−.11, .12] | [.14, .27] | [−.09, .13] | [.11, .12] | [−.12, .21] | [.06, .14] | [−.10, .18] | [.01, .18] | [−.03, .16] | [.01, .17] | [−.02, .15] | [.08, .19] | [−.12, .12] | [.05, .15] | [−.14, .08] |
| z value | 10.78*** | .06 | 6.28*** | .30 | 41.56*** | .30 | 5.38*** | .50 | 2.12* | 1.34 | 2.11* | 1.50 | 4.51*** | .01 | 4.19*** | −.50 |
| Cochran's *Q* | 6.87† | 66.21*** | 17.97*** | 53.43*** | 5.65 | 118.20*** | 5.90 | 107.30*** | 21.22*** | 10.64** | 17.75*** | 9.06* | 2.89 | 10.13** | 1.34 | 8.08* |
| $I^2$ | 56.80% | 93.15% | 76.87% | 92.58% | .08% | 95.95% | 40.42% | 95.45% | 88.28% | 90.43% | 86.26% | 87.13% | 30.42% | 80.65% | .00% | 78.13% |
| U.S. only | .22 | −.05 | .16 | −.03 | .14 | −.04 | .12 | −.03 | .14 | .09 | .13 | .09 | .14 | .00 | .10 | −.03 |
| 95% CI | [.16, .29] | [−.14, .05] | [.12, .21] | [−.14, .08] | [.06, .22] | [−.15, .07] | [.03, .21] | [−.13, .07] | [.09, .19] | [−.09, .26] | [.08, .18] | [−.06, .24] | [.08, .19] | [−.12, .12] | [.05, .15] | [−.14, .08] |
| zval | 7.0257*** | −.99 | 6.59 | −.51 | 3.44*** | −.77 | 2.58** | −.57 | 5.37*** | .96 | 4.97*** | 1.22 | 4.51*** | .01 | 4.19*** | −.50 |
| Cochran's *Q* | 3.21 | 6.60* | 1.61 | 8.02* | 5.30† | 8.89* | 5.85† | 6.74* | .28 | 10.23** | .28 | 7.07** | 2.89 | 10.13** | 1.34 | 8.08* |
| $I^2$ | 41.08% | 69.81% | 5.17% | 75.48% | 61.54% | 77.99% | 65.71% | 70.20% | .00% | 90.22% | .00% | 85.85% | 30.42% | 80.65% | .00% | 78.13% |

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

## General Discussion

In four methodologically diverse studies consisting of a wide range of participants from various cultures and socioeconomic spectrums, we found support for our theoretical arguments about social class, overconfidence, and status attainment. We first conducted an ecologically valid test of our hypothesis using a large field study of small-business owners in Mexico, and found some evidence that individuals with relatively high social class were more overconfident compared with their lower-class counterparts. Then, in Study 2, we replicated this result with a large, multiwave survey in the U.S., and showed that their overconfidence arises, in part, from a strong social rank motive. Then, in Study 3, we replicated these findings in a high-powered, multiwave, and preregistered study and found that upper-class individuals were more overconfident compared with their lower-class counterparts, even in a task in which they had no performance advantages. Finally, Study 4 showed using a multiphase hiring paradigm that these relationships have substantial consequences: Compared with university students from more modest backgrounds, university students from more advantaged backgrounds had higher levels of overconfidence, which, in turn, made them appear more competent and more hireable in the eyes of independent evaluators. Across all studies, we measured social class and overplacement in multiple ways and found that while there were some differences across the class measures and the different analytical approaches, the internal meta-analyses suggested that there was strong evidence that social class was positively associated with overconfidence.

Our studies had a number of strengths. First, the data were extensive, involving 152,661 individuals in total, with participants from two countries who were small-business owners (Study 1), adults (Studies 2 and 3), and university students (Study 3), as well as over 950 independent judges. The fact that we were able to observe the relationship between social class and overconfidence across many different contexts, populations, and operationalizations of social class assures us that the relationship is robust. To our knowledge, this has been the *most comprehensive* test of the hypothesis that social class is a predictor of overplacement. Second, we developed and tested a theory underlying this link, using multiple measures of our key theoretical constructs. To our knowledge, this is also the first systematic investigation of *why* social class might be linked to overconfidence. Third, the final study showed the importance of these findings in the real world by demonstrating that the overconfidence of high-class individuals can provide a path to social advantage. And finally, the studies used diverse designs, including naturalistic, field, multiphase, and longitudinal paradigms.

### Theoretical Contributions

**The reproduction of inequality and social hierarchies.** Our findings join a growing body of research that seeks to understand the persistence of class-based hierarchies. For example, some scholars have suggested that social class hierarchies may reproduce, in part, because those who are at the top favor the status quo (e.g., Belmi & Neale, 2014; Kraus & Keltner, 2013). Other scholars have focused on how systemic discrimination and bias prevent those at the bottom from moving up, in spite of their best efforts and intentions (Belmi et al., 2015; Bielby & Baron, 1986; Kang et al., 2016; Laurin et al., 2011; Moss & Tilly, 2003; Pager et al., 2009; Rivera, 2016). And other scholars have suggested that inequality may perpetuate when the values and norms in mainstream institutions exclude the values and norms of individuals from underrepresented groups (Belmi & Laurin, 2016; Stephens et al., 2012; Stephens, Markus, et al., 2014). All of these explanations play an important role in perpetuating inequality.

Our findings suggest that class-based inequality may also reproduce, in part, because class contexts can imbue advantaged individuals with an exaggerated belief that they are better than others, and outside observers may conflate this miscalibrated confidence with evidence of competence. Thus, our findings suggest that to mitigate inequality, institutions need to establish mechanisms that allow the accurate assessment of competence. For example, many scholars have questioned the value of using interviews in hiring and selection efforts because interviews are highly susceptible to bias (Hunter & Hunter, 1984). Without such mechanisms in place, our society may inadvertently and disproportionately reward those who appear competent, even when they might not necessarily be the most qualified (Anderson, Brion et al., 2012; Anderson & Kilduff, 2009). For example, in Study 4, it is striking that appearing competent was more strongly linked to overconfidence than to actual competence.

Our findings also suggest that finding solutions to mitigate inequality may also require a focus on subtle and seemingly harmless human tendencies (e.g., DiTomaso, 2013). Although people may be well meaning, status inequalities may inadvertently continue to perpetuate if individuals do not correct for their natural human tendency to conflate impressions of confidence with evidence of ability. Without such corrections, individuals with relatively high social class are likely to have a social advantage because of their overconfidence, compounding the many other mechanisms that facilitate their advantages (Belmi et al., 2015; Bird & Bogart, 2001; Darley & Gross, 1983; Kang et al., 2016; Kraus & Keltner, 2013; Laudicella et al., 2012; Laurin et al., 2011; Rivera, 2016; Stephens et al., 2012). It is our hope that by documenting this subtle class advantage, scholars and practitioners may be able to recognize it, which is an important aspect of mitigating inequality.

That said, we also do not mean to imply that people with overly positive self-perceptions have no value in groups; in fact, in some cases, their presence in teams can be beneficial, because their confident demeanor may inspire others to develop their own confidence, given that people learn from and mimic each other (Bandura, 1971; Barsade, 2002). However, for organizations and groups that are striving to create a meritocratic system where there are equal opportunities for everyone and in which status and influence are equitably assigned based on one's knowledge and skills, our findings suggest that it would be important to establish structural mechanisms that would enhance a group's ability to locate the individuals that possess true expertise. Without such mechanisms, decision makers and gatekeepers may disproportionately reward individuals who already have an advantage because of their apparent competence, even though those individuals may not necessarily be the ones who would best serve a group's interests.

Organizations often fail to leverage the unique and valuable insights that underrepresented groups possess (Mannix & Neale, 2005; Nemeth, 1986), because the values and norms of mainstream institutions often fail to include the values and norms of under-

represented groups (Stephens, Markus, et al., 2014). For managers and decision makers, creating more inclusive group norms, fostering psychological safety, and providing social support and resources to members of underrepresented groups (Belmi & Laurin, 2016; Stephens et al., 2017; Stephens, Hamedani, & Destin, 2014) can all help underrepresented group members cultivate their voice so that others may recognize their expertise.

**Social class and self-views.** Our research also contributes to the research on social class and self-views. As noted in the introduction, there is an extant literature documenting that individuals with relatively high social class tend to see themselves in a more favorable light compared with their lower-class counterparts (e.g., Judge & Hurst, 2007; Kraus & Park, 2014; Piff, 2014; Varnum, 2015). However, most of these past studies do not distinguish between positivity of self-views and overconfidence (see Humberg et al., 2018). For example, Varnum (2015) reported that the tendency to see one's self as BTA seems more prevalent among individuals with relatively high (vs. low) social class. However, as Krueger and Wright (2011) noted, in some cases, BTA measures cannot reliably differentiate between realistic and unfounded claims. In other words, without an objective standard or criterion as a basis of comparison, it remains possible that previously reported correlations between social class and BTA measures do not necessarily reflect biased or overly positive self-perceptions. By incorporating objective standards as a basis of comparison in our methods, our studies offer much more precision compared with previous investigations, providing more definitive evidence that social class is, in fact, associated with overly positive self-perceptions.

Furthermore, we not only provided a comprehensive test between social class and overplacement, but we also integrated different theoretical perspectives, ranging from cultural mismatch theory (Stephens et al., 2012; Stephens, Markus, et al., 2014), research on power and social rank motives (Belmi & Laurin, 2016), and research on status conferral (e.g., Anderson, Brion et al., 2012) to illuminate why social class might be linked to overconfidence. We find that higher-class individuals tend to be more overconfident than their lower-class counterparts because they more strongly desire positions of high social rank.

One issue that deserves further investigation is why overplacement showed a stronger link to subjective social class than did objective indices of social class. One straightforward possibility is that the ladder measure of subjective social class shares some methodological overlap with the overplacement measure. However, even though we tried to address this possibility by measuring social class and overconfidence at different points (particularly in Studies 2 and 3), the internal meta-analysis showed that the effect sizes continued to be substantially larger when we considered people's subjective sense of their standing rather than their objective, material resources. It is possible that where people place themselves on the ladder may itself be vulnerable to positive illusions. For example, many individuals in the U.S. tend to subjectively identify as middle class despite economic evidence that they "should" identify with a different group (Diemer & Ali, 2009; Diemer, Mistry, Wadsworth, López, & Reimers, 2013; Rossides, 1990).

Finally, the fact that social class is systematically linked to overconfidence may also help shed light on recent findings in the social class, leadership, and status literature. In a study on active soldiers in the U.S. Army, Martin, Côté, and Woodruff (2016) found that soldiers who came from wealthier backgrounds tended to be less effective leaders in their units compared with soldiers who grew up from less wealthy backgrounds. For example, these individuals were rated by their followers as having poor capabilities to do their tasks well. Our findings suggest that this may occur, in part, because of overconfidence, which often causes poor decision-making (see Barber & Odean, 2000; Camerer & Lovallo, 1999; Cheng, 2007; Glaser & Weber, 2007; Howard, 1983; Johnson, 2004; Koellinger, Minniti, & Schade, 2007; Malmendier & Tate, 2005; Neale & Bazerman, 1985; Odean, 1998, 1999). Taken together with the literature on overconfidence and decision making, our findings suggest an important paradox: The individuals people systematically choose to elevate to positions of high social rank and thus have the potential to wield undue influence may not always necessarily be the same people who are capable of making the best decisions.

**Contributions to the overconfidence literature.** Our findings also contribute to the overconfidence literature by documenting an important predictor of overplacement: A person's social class. To our knowledge, no prior research has investigated the relationship between overplacement and *multiple* aspects of social class (e.g., income, education, parental education, and subjective rank) simultaneously, nor have previous investigations sought to offer a theoretical perspective on what might link this relationship.

A reader may wonder whether documenting this relationship is important, considering that the meta-analytic estimates suggest that the relationship between social and overplacement is smaller than the average effect sizes commonly documented in social psychology. We think that this relationship is important for several reasons. First, these findings are important because the factors that shape overplacement have been relatively understudied to date (see Moore & Schatz, 2017), which is unfortunate considering that overconfidence has been linked to suboptimal decision-making (Barber & Odean, 2000; Camerer & Lovallo, 1999; Cheng, 2007; Koellinger et al., 2007; Malmendier & Tate, 2005; Odean, 1998, 1999) and is frequently cited as a significant underlying cause for many organizational catastrophes (Camerer & Lovallo, 1999; Glaser & Weber, 2007; Howard, 1983; Johnson, 2004; Malmendier & Tate, 2005; Neale & Bazerman, 1985; Odean, 1999). Second, our findings raise the possibility that overplacement may not nearly be as universal as researchers think it is (Beer & Hughes, 2010; Chamorro-Premuzic, 2013; Dunning, 2005; Sharot, 2011; Taylor, 1989), as our results suggests that this type of thinking might be more prevalent among middle- and upper-class contexts. Third, given the large sample sizes across our studies, our investigation provides one of the most accurate estimates of the relationship between social class and overplacement to date. And most importantly, the final study demonstrated that the relationship between social class and overplacement is both theoretically and practically important to understand, because it can have substantial implications for how and why social advantages get reproduced (e.g., Fiske & Markus, 2012; Magee & Galinsky, 2008; Stephens, Markus, et al., 2014). For these reasons, we contend that these findings are both theoretically and practically important. We believe that this is a case wherein statistically small effects may be worth studying (e.g., Prentice & Miller, 1992).

Our investigation also contributes to the overconfidence literature by simultaneously considering multiple forms of social class,

by utilizing different tasks to measure overplacement, by testing our hypotheses in ecologically valid contexts, and by using different approaches to analyze our data. As noted in the introduction, researchers have used different methodological approaches to measure it–sometimes disagreeing on which is best–and very few investigations "have tried to apply different discrepancy measures (difference scores and residuals) to the same data" (see De Los Reyes & Kazdin, 2004, for an exception; cf. Krueger & Wright, 2011, p. 483). As our own investigations reveal, we did find that these different approaches can sometimes reach different conclusions, and our goal was *not* to declare that one approach is superior to another. Rather, we analyzed our data using different approaches because both difference scores and residual scores have their own strengths and limitations (for a discussion, see Krueger et al., 2017), and our hope is that by presenting all results we can get to a more accurate understanding of social class and its relationship with overplacement. We hope that our work inspires future researchers to do the same.

## Directions for Future Research

Future research might address the limitations of our current investigation. First, we only investigated one type of overconfidence. As noted in the introduction, overconfidence can also manifest in terms of overestimation and overprecision, and research suggests that different facets of overconfidence do not necessarily have the same psychological origins (Moore & Schatz, 2017). Therefore, future research might investigate how and w*hy* social class might relate to these two other forms, and whether those forms of overconfidence could contribute to the reproduction of class-based hierarchies. Second, we only investigated a handful of domains; it is likely that the link between social class and overplacement would be stronger in some domains than in others; understanding these domains would yield a more precise understanding of this relationship and would yield further insights about the psychology of social class. Third, it would also be important to understand the consequences of overconfidence beyond middle-class settings. In Study 4, we focused on a middle-class organization because middle-class contexts often play a crucial role in providing access to valued life opportunities and upward social mobility (Stephens, Markus, et al., 2014). It would be important to understand how overconfident individuals are received in working-class contexts. Fourth, future research could incorporate longitudinal designs to examine some of our theoretical arguments; for example, one possibility might be to examine how changes in social class over the course of a lifetime might correspond to changes in overplacement. And finally, future research could investigate how social class relates to the psychology of overplacement in cultural contexts (e.g., Miyamoto et al., 2018) that are distinct from those tested here.

## Conclusion

A cursory look at today's society suggests that we have far to go to reach a true meritocracy. Although differential access to networks and explicit discrimination and prejudice certainly contribute to this outcome, it is also important to uncover the subtle human tendencies that may inadvertently support systematic inequality. Even when people may have the best of intentions, they may contribute to the reproduction of inequality, especially in situations when they rely on behavioral proxies for abilities to infer the competence of others.

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