# When overconfidence is revealed to others: Testing the status-enhancement theory of overconfidence

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## ABSTRACT

The *status-enhancement theory* of overconfidence proposes that overconfidence pervades self-judgment because it helps people attain higher social status. Prior work has found that highly confident individuals attained higher status regardless of whether their confidence was justified by actual ability (Anderson, Brion, Moore, & Kennedy, 2012). However, those initial findings were observed in contexts where individuals' actual abilities were unlikely to be discovered by others. What happens to overconfident individuals when others learn how good they truly are at the task? If those individuals are penalized with status demotions, then the status costs might outweigh the status benefits of overconfidence – thereby casting doubt on the benefits of overconfidence. In three studies, we found that group members did not react negatively to individuals revealed as overconfident, and in fact still viewed them positively. Therefore, the status benefits of overconfidence outweighed any possible status costs, lending further support to the status-enhancement theory.

## Introduction

In a wide variety of domains, individuals believe they are better than others, even when they are not (for reviews, see Alicke & Govorun, 2005 and Dunning, Heath, & Suls, 2004). Yet research has documented numerous costs of this overconfidence. For example, falsely believing one is more capable than others leads entrepreneurs to risk too much in new ventures (Camerer & Lovallo, 1999), CEOs to engage in too many acquisitions of other firms (Malmendier & Tate, 2005), and nations to initiate too many military confrontations (Johnson, 2004).

Why is overconfidence so common if it incurs such high costs? Anderson et al. (2012) recently found that overconfident individuals attain higher social status, or respect and influence, in groups. Their findings lent support to a *status-enhancement theory* of overconfidence, which posits that overconfidence pervades human self-judgment because it helps individuals attain higher social status. That is, overconfidence is rewarded with higher status; the prospect of higher status can encourage displays of confidence.

However, an important limitation of those initial findings is that they were observed primarily in contexts where overconfident individuals had little chance of being discovered by others—namely, in short-lived laboratory interactions in which people were unlikely to detect each other's actual abilities. This limitation is important because in many real-world contexts, including many organizations, people can ascertain each other's actual levels of ability, and hence, learn when others are overconfident. For example, salespeople often learn of each other's quarterly performance, allowing them to compare each other's level of confidence to actual performance.

What happens to individuals if others recognize their overconfidence? If people punish the overconfident (Paulhus, 1998), overconfidence entails risks. For example, arrogant group members might be demoted in the status hierarchy. Accordingly, the status-related costs incurred after being exposed as overconfident might negate the status benefits those individuals initially enjoyed. Such a finding would undercut a status-enhancement explanation for overconfidence.

The current research thus focused on this key question: how do groups respond to overconfident members when those members' actual task abilities are revealed? We tested whether overconfidence incurs status penalties once it is revealed to others, and if so, whether those penalties outweigh the initial status benefits of being overconfident. We conducted three studies that examined overconfidence both naturalistically in task groups and through experimental manipulation. We used self-ratings of competence to measure confidence and objective indices of actual performance to measure ability; we then examined their effects on group-, peer-, and observer-derived measures of status.

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*Overconfidence*

Overconfidence is the possession of inaccurate, overly positive perceptions of one's abilities or knowledge (for a review, see Moore & Healy, 2008). Overconfidence is measured by comparing individuals' self-perceptions of ability to objective, operational criteria such as actual task performance and test scores (e.g., Krueger & Mueller, 2002; Kruger & Dunning, 1999; Larrick, Burson, & Soll, 2007). Individuals are overconfident when they believe they are better than objective measures indicate.

Scholars have long documented the many costs of overconfidence. For example, overconfident people fail to recognize their limitations and set unrealistic goals (Ehrlinger & Dunning, 2003), engage in contests they are likely to lose (Camerer & Lovallo, 1999), and select negotiation strategies that promote failure (Neale & Bazerman, 1985). The persistence of overconfidence is therefore puzzling because being able to accurately place one's abilities relative to those of others is clearly useful (e.g., Alicke, 1985; Dunning et al., 2004; Larrick et al., 2007).

*The status-enhancement theory of overconfidence*

To help explain the puzzling pervasiveness of overconfidence, Anderson et al. (2012) proposed that higher confidence helps individuals attain higher social status. Status is respect, prominence, and influence accorded to individuals by their social groups (Anderson, John, Keltner, & Kring, 2001; Bales, Strodtbeck, Mills, & Roseborough, 1951; Berger, Cohen, & Zelditch, 1972). Higher social status comes with a host of benefits including control over group decisions and access to scarce resources (Berger et al., 1972; Blau, 1964). Accordingly, the desire for high status is a fundamental and powerful motive (Maslow, 1943; Tay & Diener, 2011).

According to Anderson et al. (2012), when individuals are more confident in their abilities, others also perceive them as more competent (also see Bass, 2008, De Cremer & van Knippenberg, 2004, Sniezek & Van Swol, 2001, Zarnoth & Sniezek, 1997). Confidence is compelling to observers because, in the absence of information to the contrary, observers assume it reflects superior ability (Tenney & Spellman, 2010; Tenney, Spellman, & MacCoun, 2008).

In turn, once individuals are perceived to possess greater competence, they are likely to be afforded higher status. A primary and consistent predictor of status in groups is perceived competence (e.g., Berger et al., 1972; Driskell & Mullen, 1990; Lord, de Vader, & Alliger, 1986). In general, groups confer higher status on individuals who exhibit abilities that help the group succeed (Berger et al., 1972; Eibl-Eibesfeldt, 1989; Emerson, 1962; Goldhamer & Shils, 1939). Because competent individuals can provide important contributions to the group's success, they tend to be given higher status.

It is important to note that being *perceived* to possess these valued characteristics is the key to attaining higher status; it is not necessary to *actually* possess these characteristics (Berger et al., 1972). For example, much research has documented that groups often mistakenly perceive individuals with certain demographic characteristics to be more competent and, as a result, groups accord those individuals higher status, even when they are actually no more competent than others (Berger et al., 1972). Perceptions of valued characteristics, not actual possession of these characteristics, drive status conferral.

A critical tenet of the *status-enhancement theory* is that higher confidence will lead to higher status, regardless of the individual's actual ability. Observers often cannot distinguish between justifiably confident and unjustifiably confident (i.e., overconfident) individuals because both exhibit similar behaviors while their actual levels of task ability are hidden within them (Anderson & Kilduff,

2009; Anderson et al., 2012; Campbell, Goodie, & Foster, 2004; McNulty & Swann, 1994; Swann, 2005). Justified confidence and overconfidence thus often appear indistinguishable to observers in the absence of objective data regarding task performance. Accordingly, even unjustified confidence can help individuals attain higher status.

In support of these arguments, Anderson et al. (2012) found that confident individuals were perceived as more competent by others and attained higher status. Moreover, this effect emerged even when individuals' confidence was not justified by actual ability – that is, even when those individuals were in fact no more competent than others.

*What happens when overconfidence is revealed to others?*

An important limitation of the aforementioned Anderson et al. (2012) findings is that they were set in contexts in which overconfident individuals had little chance of being discovered as overconfident. In groups that worked together for short periods of time and in which individuals' actual abilities were never revealed, unwarranted confidence (i.e., overconfidence) is likely to yield only status benefits for the individual because others have little reason to question the person's high level of confidence. When overconfidence is unlikely to be discovered, the risk of social punishment is small.

In reality, however, groups sometimes learn about members' actual characteristics and abilities as they work together. For example, group members more accurately discern each other's competence, personalities, and attitudes as they work together over time (Harrison, Price, Gavin, & Florey, 2002; Kenny, 1991; Littlepage, Robison, & Reddington, 1997; Paulhus & Bruce, 1992; Peltokorpi, 2008). In these contexts, it is possible that overconfident individuals will be discovered as being overconfident. Accordingly, those individuals might be penalized for their perceived hubris (Paulhus, 1998; Tenney & Spellman, 2010; Tenney et al., 2008).

But are individuals punished when others learn of their overconfidence? In the following sections we describe the arguments for and against the idea that groups penalize overconfident individuals once they detect the individuals' actual levels of task performance.

*The case for punitiveness*

Functionalist theories of status suggest that groups would penalize confident individuals with lower status if they were to discover that the individuals' confidence is unwarranted. Groups accord lower social status to individuals who hinder the group's success (e.g., Blau, 1964; Ridgeway & Diekema, 1989). Groups might thus penalize overconfident individuals because overconfidence jeopardizes task performance (Barber & Odean, 2000; Klein & Kunda, 1994; Metcalfe, 1998; Paese & Kinnaly, 1993; Vancouver, Thompson, Tischner, & Putka, 2002).

Moreover, groups might view individuals with unwarranted confidence as more selfish and less committed to the group's success, and thereby accord them lower status (Willer, 2009). In laboratory experiments, groups ostracized individuals who claimed more status than the group believed them to deserve and paid them less for their work (Anderson, Ames, & Gosling, 2008; Anderson, Srivastava, Beer, Spataro, & Chatman, 2006). Taken together, these findings suggest groups might penalize overconfident members with lower status. In other words, groups might accord overconfident individuals a lower level of status than that accorded to others with the same level of competence but more accurate self-perceptions of ability.

*The case against punitiveness*

The above arguments notwithstanding, we propose that groups will not penalize overconfident individuals, even after discovering that those individuals' confidence is unwarranted. Indirect evidence cited below suggests that high levels of confidence might create positive peer-perceptions that remain even after actual task performance is revealed to others.

These resilient positive peer-perceptions may take two forms. First, confident individuals might appear more socially skilled to others, even when their confidence is unwarranted by actual task abilities. Groups accord higher status to those with perceived social skills (Bass & R.), 2008; Lord et al., 1986; Stogdill, 1948). Social skills contribute to a group by helping to coordinate other members' activities, solve conflicts, and motivate others while maintaining cohesion within the group (Bass, 2008; Fragale, 2006; Mann, 1959; Van Vugt, 2006). Individuals who are confident may appear socially skilled by acting more engaged, speaking more often, and participating actively. Communication is a key aspect of social skill (Hall, 1979; Riggio, 1986) and individuals who communicate more are often seen as more skilled (Breland & Jones, 1984; Littlepage & Mueller, 1997; Littlepage, Schmidt, Whisler, & Frost, 1995). Consequently, these individuals receive attributions of greater leadership ability (Mullen, Salas, & Driskell, 1989; Sorrentino & Boutillier, 1975; Sorrentino & Field, 1986).

In addition to increasing quantity of communication, confidence may also reduce anxiety about participating in the task. This may result in more fluid, clear, concise speech and smoother social interactions. Past studies have found that lower anxiety relates to higher performance on a variety of tasks, from academic tests to interpersonal interactions (Brooks & Schweitzer, 2001; Glass, Merluzzi, Biever, & Larsen, 1982; Littlepage, Morris, & Poole, 1991; Osborne, 2001; Plaks & Stecher, 2007; Steele, 1997). With less anxiety, confident individuals, even when their confidence is unjustified by actual task ability, may be more articulate and attentive to others. The combination of more frequent participation and more fluid social interaction may lead to impressions that confident individuals possess superior social skill.

Second, high levels of confidence might create positive perceptions of task ability that persist even in the face of contradicting evidence. First impressions exert lasting influence on interpersonal judgments (Benassi, 1982; Jones, Rock, Shaver, Goethals, & Ward, 1968; McAndrew, 1981; Mussweiler, 2003; Steiner & Rain, 1989; Zenker, Leslie, Port, & Kosloff, 1982). Impressions of task ability might not completely adjust to account for the objective feedback provided. Therefore, even when objective information on task performance contradicts initial impressions, group members may perceive confident individuals to possess higher task ability.

If confidence creates persistent peer impressions of social skill or task ability, groups may not penalize confident individuals with lower status, even after discovering these individuals' confidence is unjustified by their actual task skills. Instead, upon discovering that individuals are overconfident in their task abilities, groups might simply accord those individuals the status they appear to deserve based on their true task performance or perceived social skills.

*Comparing the benefits and costs of unwarranted confidence: The net value of overconfidence*

Central to the current research is whether the status benefits of overconfidence outweigh the potential status costs if one's overconfidence is revealed to others. If so, this helps further support the *status enhancement* account of overconfidence. One way to test whether the status benefits outweigh the costs is to examine whether overconfidence yields a "net" positive status outcome for the individual on average. To illustrate in a simplistic way, if being overconfident led an individual to gain an "extra" 3 status

points when her overconfidence was unknown to others, but to then lose 5 status points when her actual task performance was revealed, overconfidence could be considered to have a negative net value. Averaging across the two situations, overconfidence would have a net status value of -1. However, if being overconfident led an individual to gain 3 status points when it went undetected, but to then lose only 1 status point when his actual task performance was revealed, overconfidence could be considered to have a net status value of +1 (i.e., a positive net value). We assessed net status outcomes in the current studies and predicted that confidence would yield net status benefits, even when the confidence was unjustified by actual ability.

## Study 1

### Overview

The design of Study 1 built upon previous research (e.g., Anderson et al., 2012; Bass, 2009; Berger et al., 1972; Ridgeway, 1987). Participants first worked individually in groups on a judgment task. We assessed participants' actual task performance and confidence in their task abilities based on their individual work. We then assessed their status and peer-perceptions from their work in the group. We will refer to this phase of the study procedure, which mirrored previous study designs, as *Phase 1*.

We then proceeded one step further than had previous research. After the group had collaborated and developed a status hierarchy, the experimenter informed the group of each member's actual relative task performance up to that point. This feedback made actual levels of task performance known to the group, and as a result, exposed some individuals as being unjustifiably confident (i.e., overconfident). The group then worked together again on the same judgment task, after which they rated each other once more. We refer to this phase of the group session, which followed the announcement of actual task performance, as *Phase 2*.

This two-phase study procedure was designed to mimic how real-world groups might proceed. In the initial stages of group collaboration, group members accord higher status to individuals whom they perceive as more competent. Lacking actual task performance data, group members tend to accord confident individuals higher status. However, as group members work together, they might obtain objective information about each other's actual levels of task performance, gaining a clearer sense of where each group member actually ranks. We were thus interested in the average effects of unjustified confidence across both stages of group collaboration, both before and after the group learned of each other's actual performance.

Our key research question was how overconfidence in Phase 1 would affect net status. For instance, if being overconfident led an individual to gain an "extra" 3 status points when her overconfidence was unknown to others, but to then lose only 1 status points when her actual task performance was revealed, overconfidence could be considered to have a net status value of +1 (i.e., a positive net value). If Phase 1 overconfidence positively affected net status, this would indicate that the status benefits of overconfidence outweigh the potential status costs if one's overconfidence is revealed to others. On average, overconfidence would have a positive expected value in terms of status.

### Measuring overconfidence

Prior research has distinguished between different types of unwarranted confidence (i.e., overconfidence; Larrick et al., 2007; Moore & Healy, 2008). In the current research, we focused on *overplacement*, which is the exaggerated belief that one is better than others. Individuals exhibit overplacement when they believe that

they rank more highly than others than they actually do. For instance, a person could believe she ranked first in her group when objective measures indicate that she actually ranked in the middle of the group. We focused on overplacement because it is the most relevant for assigning or conferring status in groups. Groups form status hierarchies based on perceptions of *relative* levels of ability rather than absolute levels (Berger et al., 1972).

*Analysis plan*

Intuitively, one might assess unjustified confidence (i.e., overconfidence) by simply subtracting individuals' actual relative abilities from their self-perceived relative abilities. Indeed, main effects of overconfidence are assessed by this simple difference between self-perceived ability and actual task performance (Gigerenzer, Hoffrage, & Kleinbölting, 1991; Larrick et al., 2007). However, the use of difference scores to measure individual differences has been widely criticized because difference scores are unreliable and tend to be confounded with the variables that comprise the index (e.g., Cohen, Cohen, West, & Aiken, 2003; Cronbach & Furby, 1970; Edwards, 1994a).

Collapsing two constructs to measure congruence between them is not ideal for a number of reasons (Edwards, 1994b, pp. 53–57): The resulting difference primarily represents the component with the larger variance; using the difference conceals the relative contribution of each variable and prevents the detection of forms of congruence in which components have opposite but unequal effects; and entering each component separately explains as much variance in the outcome as considering the two components jointly. Using both components as separate predictors avoids these problems.

Therefore, we used Edwards' polynomial regression approach (1994a, 1994b; Edwards & Parry, 1993), in which we predicted status with self-perceived ability and actual performance as separate components. In this analysis, the effect of self-perceived ability demonstrates the effect of confidence on status, above and beyond actual ability; it tests whether higher confidence leads to higher status, controlling for individuals' actual ability. The effect of actual ability in this analysis tests whether actual ability, above and beyond confidence, also leads to status.

To test whether the effect of confidence held up regardless of whether the confidence was warranted, we also included the interaction between confidence and actual performance in the regression. This interaction term tests whether the effect of confidence on status depends on whether individuals were actually competent. A significant interaction effect, for example, might suggest that confidence leads to status only when it is justified by high levels of task performance. A non-significant interaction effect would demonstrate that higher levels of confidence lead to higher status, regardless of actual levels of task performance. We did not hypothesize a significant interaction between confidence and actual task performance; instead, we expected that confidence would predict status regardless of the individual's actual ability.

Finally, we entered quadratic terms for both components, as recommended by Edwards (1994b). This allowed us to test whether the relations between status and each component were non-linear.

This approach had a number of advantages over other methods of testing congruence. It allows each component's effect on status to be interpreted, does not confound the effects of the components, and provides a complete test of possible underlying models (Edwards, 1994b, p. 87).

*Method*

*Participants*

Participants were 140 students and staff at a West Coast university (64% women). The participants had a mean age of 20 years

(SD = 2.3) and were approximately 17% Caucasian, 74% Asian, 4% African American, 4% Hispanic, and 1% other ethnic backgrounds.

*Procedure*

As participants arrived they were assigned to groups of four. The laboratory session had two phases. In Phase 1, participants answered eight questions that a well-informed person might know, about geography, history, art, business, and social science. For instance, participants were asked the date on which the US Constitution was signed and the median household income in the US (We determined the threshold for whether answers were scored as accurate based on a pre-test of the task with 46 respondents. We counted answers that fell within half a standard deviation of the correct answer as accurate, resulting in 34% of answers being counted as accurate. Participants were informed of this method of calculating accuracy.)

The group then worked together on eight additional general knowledge questions as a team. After the group completed all of its estimates, participants individually completed a short mid-experiment survey. The experimenter assured participants that their responses to the survey were completely confidential and asked participants to cover their answers with a spare sheet of paper to ensure others could not see their answers. Each group member's seat was labeled prominently with a letter, "W," "X," "Y," or "Z," so that participants could easily identify each group member while answering the survey.

As the participants completed their mid-session surveys, the experimenter calculated the accuracy of the answers individuals provided before the group began working together. This allowed the experimenter to rank participants by their performance on the individual task. Once all group members had turned in their surveys, the experimenter distributed a sheet of paper listing participants' task performance rankings and read them aloud, identifying participants by seat letter. Specifically, she said, "In terms of your performance, Person [W, X, Y, or Z] was the highest performing, Person [ ] was second highest, Person [ ] was third, and Person [ ] was fourth." No information was provided to the group regarding its collective performance.

Phase 2 of the study began after participants learned each other's individual performance rankings. Group members worked on additional general knowledge questions as a team, after which participants individually completed a post-task survey. The experimenter did not announce the individual task performance rankings at the end of Phase 2, however.

*Measures*

*Status in the group*

Based on previous research on status in groups (e.g., Bales et al., 1951; Berger et al., 1972), we measured status with peer-ratings of status, influence, and leadership behavior. After each of the two phases, each participant privately ranked all members' status (i.e., respect and standing in the group) and influence in the group's discussion and rated all members in terms of how much leadership they displayed, on a scale of 1 (*Follower*) to 5 (*Leader*). We used the software program SOREMO (Kenny, 1998) to compute a social relations model analysis of these round-robin peer-perceptions. SOREMO calculates scores that are statistically independent of group membership and thus appropriate for conventional least squares procedures that assume independence (see Kenny & La Voie, 1984). Because lower numbers indicated higher rank in terms of the attribute (e.g., 1 indicated 1st rank), we reverse-scored all ranking measures, here and subsequently. SOREMO analysis revealed significant variance attributable to the rated persons (in Phases 1 and 2, respectively, influence: .67, .48; status: .55, .53; leadership: .53, .42), indicating that group members agreed on

who had more status in the group (Kenny & La Voie, 1984). On the basis of prior research (e.g., Gray-Little & Burks, 1983), we also measured each participant's "objective" influence on the group's decisions in each phase. We calculated how far each person moved in his/her individual estimate, on average, when agreeing to the group estimate. Larger numbers indicated more movement from an individual's estimates to the group estimates, suggesting the individual moved more from his or her decision, and thus had less influence on the group's decision (see Gray-Little & Burks, 1983). Peer-ranked status, peer-ranked influence, peer-rated leadership, and the objective influence measure were highly correlated (Phase 1 $\alpha$ = .77, Phase 2 $\alpha$ = .73). We then standardized all four measures and averaged them into one overall index of status in the group.

Finally, to measure the "net status" individuals received, or their expected status value across the two phases, we calculated their average status across Phases 1 and 2. This measure of net status helped us gauge whether unwarranted confidence (i.e., overconfidence) had net status benefits or costs, across situations in which individuals' actual task performance was unknown to the group and in situations when it became known to the group.

*Actual task performance*

We measured actual task performance by summing how many of each individual's answers fell within a half a standard deviation (determined from the pre-testing distribution) of the correct answer. We then rank-ordered the group in order of their performance, and resolved any ties by calculating how close individuals' answers were to the correct answer.

*Self- and peer-ranked task ability*

After each phase, participants privately ranked the ability of each group member, including themselves. Specifically, participants ranked group members with respect to their ability to correctly solve the problems. SOREMO showed statistically significant amounts of relative target variance in both phases (.54 and .52 in Phases 1 and 2, respectively), indicating that group members agreed about one another's task ability in both phases.

*Peer-ranked social skill*

A number of social skills predict higher status in groups (Van Vugt, 2006). However in the laboratory context, we expected verbal skills to be a critical social skill—more important than, for instance, the ability to learn a social network (Flynn, Reagans, Amanatullah, & Ames, 2006). Participants thus ranked the group members on how verbally skilled they were. SOREMO showed group members agreed on who had more verbal skill: relative variance attributable to the person rated on the measure for Phases 1 and 2 was .41 and .40, respectively, suggesting high consensus on this attribute.

*Peer-ranked group commitment*

Participants ranked the group members on how much they cared about the group's performance. SOREMO again showed statistically significant relative target variance in Phases 1 and 2 (.20 and .38, respectively).

*Results and discussion*

Descriptive statistics and correlations among all variables appear in Table 1.

*Phase 1: Pre-performance feedback*

Results from the regression analysis predicting status in Phase 1 are shown in the second column of Table 2. Consistent with prior work, confidence predicted higher status. This suggests that independent of their actual task performance, individuals who ranked themselves more highly than other group members on task performance were afforded higher status by the group. Actual task performance, controlling for self-perceived ability, was also associated with higher status in Phase 1. Finally, the interaction between confidence and actual performance was not significant. This indicates the effect of confidence on status in Phase 1 was not moderated by the actual performance. Higher confidence led to higher status, whether or not the confidence was warranted – consistent with the findings from Anderson et al. (2012). Following Edwards and Parry (1993), we entered the quadratic terms for both component terms. The quadratic terms for confidence, $\beta = -.34$, $t(134) = -0.78$, $p = .44$, and actual task performance, $\beta = .19$, $t(134) = 0.45$, $p = .65$, were non-significant, Cohen's $f^2 = 0.54$.

*Phase 2: Post-performance feedback*

We next examined how groups reacted to overconfident members after hearing the actual task performance rankings. If groups penalize overconfident individuals, one would expect overconfidence in Phase 1 to predict lower status in Phase 2. Results from the regression analysis predicting status in Phase 2 appear in the third column of Table 2.

As shown, confidence did not predict Phase 2 status. This suggests that although the positive effect of confidence on status no longer held in Phase 2, the effect of confidence on status was not negative. That is, individuals who were more confident, independent of their actual performance, were not afforded lower status in Phase 2. Moreover, the interaction between confidence and actual ability was not significant. This suggests that even individuals with unwarranted confidence were not punished with lower status. That is, even after groups learned of an individual's overconfidence, they did not accord that person lower status than other equally performing individuals with more accurate self-perceptions of ability.

Higher actual task performance in Phase 1 did lead to higher status in Phase 2. This is unsurprising because group members had just been informed of each other's relative task performance in Phase 1, and therefore could use that information to accord status in Phase 2.

Again following Edwards and Parry (1993), we entered the quadratic terms for both component terms. The quadratic terms for confidence, $\beta = .12$, $t(134) = 0.29$, $p = .77$, and actual task performance, $\beta = .06$, $t(134) = 0.14$, $p = .89$, were non-significant, Cohen's $f^2 = 0.66$.

*Net status*

Did the status-related costs of unwarranted confidence outweigh the benefits? In other words, did individuals with unwarranted confidence, once their actual performance was exposed, lose so much status that unjustified confidence was more costly than beneficial? If so, this would undercut the status-enhancement theory of overconfidence.

Results from the regression analysis predicting net status are shown in the final column of Table 2. Phase 1 confidence significantly predicted higher net status, or higher levels of status on average across the two phases. Therefore, more confident individuals enjoyed higher status across the two phases on average, including after their actual task performance was revealed.

Moreover, the interaction between confidence and actual performance was again not significant. This indicates that higher confidence benefitted individuals' status on net, regardless of the person's actual performance. Overconfident as well as justifiably confident individuals attained higher net status than those with more accurate self-perceptions of ability. The quadratic terms for confidence, $\beta = -.12$, $t(134) = -0.30$, $p = .77$, and actual task performance, $\beta = .13$, $t(134) = 0.34$, $p = .74$, were non-significant, Cohen's $f^2 = 0.72$.

**Table 1**
Descriptive statistics and correlations among variables in Study 1.

| Variable | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| *Phase 1* | | | | | | | | | | |
| 1. Status | 0.00 | 0.77 | – | .44 | .52 | .73 | .64 | .75 | .60 | .93 |
| 2. Actual task performance | −2.50 | 1.12 | | – | .35 | .58 | .72 | .47 | .41 | .55 |
| 3. Self-ranked task ability | −2.66 | 1.05 | | | – | .43 | .43 | .34 | .36 | .51 |
| *Phase 2* | | | | | | | | | | |
| 4. Status | 0.00 | 0.74 | | | | – | .79 | .76 | .63 | .93 |
| 5. Peer-ranked task ability | −2.45 | 0.98 | | | | | – | .68 | .58 | .77 |
| 6. Peer-ranked social skill | −2.49 | 0.91 | | | | | | – | .67 | .81 |
| 7. Peer-rated group commitment | −2.44 | 0.91 | | | | | | | – | .66 |
| 8. Net status | 0.00 | 0.70 | | | | | | | | – |

*Note.* Descriptive statistics for self- and peer-rated variables indicate scores generated by the Social Relations Model (SOREMO; Kenny, 1998). Phase 1 indicates data prior to when actual task performance was revealed. All correlations significant at $p < .001$. All ranking variables were reverse-scored so that higher numbers indicated more positive perceptions of that characteristic.

**Table 2**
Linear regression analyses predicting status in Study 1.

| Variable | Status in the group | | |
|---|---|---|---|
| | Phase 1 | Phase 2 | Net |
| Confidence | .33[*] | .27[†] | .32[*] |
| Performance | .20 | .51[**] | .38[*] |
| Confidence × Performance | −.16 | .03 | −.07 |
| Adjusted $R^2$ | .33 | .38 | .40 |
| df | 136 | 136 | 136 |
| Cohen's $f^2$ | 0.53 | 0.66 | 0.72 |

*Note*: Values represent standardized coefficient estimates.
[†] $p < .10$.
[*] $p < .05$.
[**] $p < .01$.

*Why did groups not penalize overconfident individuals after actual task performance was revealed?*

Finally, we examined peer-perceptions of social skill, task ability, and group commitment in Phase 2. In separate regression analyses, with confidence and actual ability as predictors, confidence in Phase 1 predicted peer-ranked social skill, $\beta = .20$, $t(137) = 2.48$, $p = .01$, peer-ranked task ability, $\beta = .20$, $t(137) = 3.38$, $p = .001$, and peer-ranked group commitment, $\beta = .24$, $t(137) = 3.00$, $p = .003$, as measured in Phase 2. Actual task performance did not emerge as a significant moderator of any of these analyses.

We next examined why individuals overconfident in Phase 1 were accorded higher status in Phase 2, after actual task performance was revealed. Specifically, we explored whether peer perceptions of social skill, task ability, and group commitment mediated the relation between Phase 1 overconfidence and Phase 2 status. To examine the evidence for mediation, we again used Preacher and Hayes' (2008) bootstrapping procedure, with 10,000 re-samples with replacement, to derive 95% bias-corrected confidence intervals for the indirect effects of Phase 1 overconfidence on Phase 2 status transmitted by peer-perceptions of social skill, task ability, and group commitment. We included the three mediators in a combined model. This analysis revealed indirect effects of .05, .06, and .02 for peer-perceived social skill, task ability, and group commitment, respectively. The 95% confidence intervals ranged from .01 to .09 for peer-perceived social skill, .03 to .11 for peer-perceived task ability, and −.001 to .04 for peer-perceived group commitment. Because the confidence intervals for peer-perceived social skill and task ability exclude zero, this analysis indicated that both variables had statistically significant indirect effects. Therefore, perceptions of social skill and task ability each mediated the relation between Phase 1 overconfidence and Phase 2 status in the group. Peer-perceived group commitment did not have a statistically significant effect.

These results thus suggest a few reasons that overconfidence was not penalized with lower status in Phase 2. First, confident individuals, as expected, were perceived as more socially skilled, even when they were exposed as overconfident. Second, overconfidence was associated with positive impressions of task ability that persisted even when actual performance on the task was revealed. Confidence positively predicted perceptions of commitment to the group. Although overconfident individuals were perceived as more, not less, committed to the group's success, perceptions of group commitment did not explain the relation between overconfidence in Phase 1 and status in Phase 2.

*Summary*

The findings from Study 1 suggest that confidence, even unwarranted confidence, led to higher status when group members were unsure of each other's actual task abilities. It also showed that unwarranted confidence was not punished with lower status when group members discovered each other's actual task performance. Consequently, overconfidence predicted higher average social status across time – before and after the actual task performance information was provided. On net, the status benefits of overconfidence seemed to have outweighed its costs.

## Study 2

We had three primary aims in Study 2. First, we made it easier for participants to identify overconfidence in others. The design of Study 1 sought to mimic the temporal processes of some real-world groups: Phase 1 mimicked the initial stages of group interaction when objective performance data are lacking, and Phase 2 mimicked contexts in which group members might, over time, obtain objective information about each other's actual levels of task performance. While this approach might resemble how individuals learn of overconfidence in the real world, it also made it possible that groups did not recognize overconfidence in others in the first place. That is, perhaps overconfident individuals' lofty self-perceptions were not transparent to others. Therefore, even when groups were provided with information regarding members' actual task performance, they could not infer overconfidence because they could not compare actual performance to confidence levels. In short, overconfident individuals might not have been socially punished simply because they were not recognized as being overconfident.

Study 2 addressed this alternative explanation by explicitly providing participants with group members' confidence levels, in addition to their actual task performance data. We then also measured participants' perceptions of overconfidence to confirm that

overconfident individuals were indeed perceived as overconfident by others.

Second, we conducted a more conservative test of our hypotheses. Prior theorists have suggested that once a status hierarchy forms within groups, group members are motivated to justify the existing hierarchy, even to the point of forming overly positive views of those at the top (Jost & Banaji, 1994; Lee & Ofshe, 1981; Lord, 1985). This suggests the group members in Study 1 might have been particularly motivated to continue viewing overconfident individuals more positively in Phase 2, even after learning of those individuals' actual ability, because those individuals had attained higher status in Phase 1.

To test the effects of overconfidence in a more conservative way in Study 2, we asked independent, outside observers to watch videos of individuals from Study 1. The target individuals in the videos were either unjustifiably confident (i.e., overconfident), justifiably confident (i.e., accurate), or underconfident. The independent judges rated these individuals' status, were then told the individuals' confidence and actual ability, and then rated their status once again. We examined how these independent judges, who presumably had no reason to justify the existing hierarchy of the groups in Study 1, would perceive overconfident individuals.

Third, we addressed another possible alternative explanation for the findings in Study 1. In Study 1, after we revealed each group member's relative task performance, we asked groups to work together again on the same task. This allowed the status hierarchy to shift and gave groups the opportunity to reallocate status, based on the performance information. However, allowing groups to work together after administering performance feedback could have enabled overconfident individuals to modify their own behavior. For example, overconfident individuals might have behaved more humbly in order to appease fellow group members and maintain positive standing in the group. If so, their lack of status penalty in Phase 2 might have been partially due to appeasement efforts.

The design of Study 2 eliminated any possible effects of appeasement behavior. Specifically, after informing participants of the individual's actual task performance, we immediately asked participants to rate that person again. In this way, their second set of ratings could not be affected by any appeasement behavior displayed by the participant.

### Method

#### Participants

Participants ($N = 116$) were recruited via the Amazon Mechanical Turk web site. This web site provides reliable and more demographically diverse data than traditional college samples (Buhrmester, Kwang, & Gosling, 2011). Participants received $1.30 in exchange for participating. One participant failed an attention check question and was excluded from subsequent analysis. The remaining sample was 59% male, 80% Caucasian, 8% African American, 4% Asian, 7% Hispanic, and 2% Native American. The mean age of the sample was 34 years ($SD = 11.0$).

#### Design and procedure

The study had a 3-condition (Confidence: Overconfident, Accurate, Underconfident), between-subjects design. The task involved watching videos of the groups from Study 1 – specifically, videos of Phase 1, pre-performance feedback. The three conditions captured the three categories participants from Study 1 could have occupied. To select the individuals that participants would rate, we first narrowed the individuals from Study 1 to those who ranked themselves either first, second, or third in task performance and who actually ranked second in terms of task performance. This ensured that the level of actual relative competence and the level of over- or under-confidence were consistent across videos in each

condition. We then randomly selected five individuals to serve as targets for each of the three conditions. This resulted in a set of fifteen distinct videos, five for each condition. The videos were shortened to display the first 4 min of the group's discussion in Phase 1.

Participants were randomly assigned to watch one of the fifteen videos. They were instructed to focus on the target individual, who was identified by a letter corresponding to his or her seat at the table. We replicated the two-phase design of Study 1. After participants watched the 4-min video, they rated the target individual's social status. Then, participants viewed a screenshot that displayed each group member's self-ranking and actual ranking in terms of task performance, along with a short description of what each of these rankings meant. Directly below the screenshot, the overconfidence manipulation check question appeared. Participants rated each group member's overconfidence, and then were asked to rate the target individual's social status once again.

#### Measures

We again refer to the phase of the experiment before participants learned of individuals' self-ranked and actual task performance as Phase 1 and the phase after this information was conveyed as Phase 2.

*Perceived confidence.* Participants read a short description of overconfidence and then rated each individual's overconfidence. The description told participants that "people sometimes can be overconfident in their abilities relative to others, or believe that they are better than others at something, even when they are not. For example, sometimes people believe they are the best performer in a group, even though they rank in the middle in terms of their performance."

Participants then reported the degree to which do they thought each person was overconfident in his/her abilities, in terms of ranking his/her abilities too highly relative to the ability of other group members, using a scale from 1 (*underconfident: he/she underestimated his/her rank in terms of abilities relative to other group members*) to 7 (*overconfident: he/she overestimated his/her rank in terms of abilities relative to other group members*), with *accurate* as the mid-point of the scale.

*Status in the group.* We measured status with five items. Using a scale from 1 (*not at all*) to 7 (*very much*), participants rated the extent to which the target individual was influential in the group's discussions, earned their respect, and achieved status in the group (i.e., respect and admiration from other group members). They also rated the extent to which they would be influenced by the person's ideas and suggestions. Finally, participants reported the extent to which the person was a leader or a follower, using a scale from 1 (*follower*) to 7 (*leader*). The five items correlated highly and were averaged to form a scale for Phase 1 ($M = 4.20$, $SD = 1.50$, $\alpha = .92$) and Phase 2 ($M = 4.41$, $SD = 1.36$, $\alpha = .92$).

#### Results and discussion

*Phase 1 status*

Analysis of variance found a significant effect of confidence in Phase 1 on status in Phase 1, $F(2, 112) = 4.98, p = .009, \eta_p^2 = .08$. Specifically, participants rated overconfident individuals ($M = 4.78$, $SD = 1.38$) as higher status than accurate individuals ($M = 3.96$, $SD = 1.45$, $t(71) = 2.46$, $p = .02$, $d = 0.58$, $r = .28$) and underconfident individuals ($M = 3.83$, $SD = 1.51$, $t(80) = 2.96$, $p = .004$, $d = 0.66$, $r = .31$). Accurate and underconfident individuals were not accorded different levels of status, $t(73) = 0.38$, $p = .71$, $d = .09$, $r = .04$. Therefore, as in prior studies, overconfident individuals were afforded higher status by observers, before observers knew of their overconfidence.

## Phase 2 perceived confidence

We first ensured that our overconfidence manipulation was effective. A one-sample t-test showed that participants perceived overconfident individuals as overconfident ($M = 5.23$, $SD = 1.39$), or higher than the scale midpoint that reflected accurate self-perception, $t(39) = 5.59$, $p < .001$, $d = 1.79$, $r = .67$. Accurate individuals were not perceived as either under- or overconfident, in that they did not differ from the scale midpoint ($M = 4.18$, $SD = 0.92$), $t(32) = 1.14$, $p = .26$, $d = 0.40$, $r = .20$. Underconfident individuals were perceived as underconfident, or lower than the scale midpoint ($M = 3.29$, $SD = 1.44$), $t(41) = -3.22$, $p < .002$, $d = 1.01$, $r = .45$.

We then ensured that each condition was significantly different from each other in terms of perceived confidence. Indeed, overconfident individuals were perceived as more confident than those in the accurate ($t[71] = 3.70$, $p < .001$, $d = 0.88$, $r = .40$) and underconfident ($t[80] = 6.22$, $p < .001$, $d = 1.39$, $r = .57$) videos. Accurate individuals were perceived as more confident than those in the underconfident condition ($t[73] = 3.12$, $p = .003$, $d = 0.73$, $r = .34$). These findings suggest that, after receiving information regarding the individuals' self-rankings and actual rankings in terms of task performance, participants did perceive overconfident individuals as being overconfident, and our manipulation of confidence was successful.

## Phase 2 status

We next examined whether overconfident individuals – who participants knew in Phase 2 to be overconfident - were penalized with lower status in Phase 2. Analysis of variance showed no evidence of a status penalty, however, $F(2,112) = 1.90$, $p = .16$, $\eta_p^2 = .03$. Overconfidence in Phase 1 did not affect the status participants accorded to individuals in Phase 2. Overconfident individuals ($M = 4.74$, $SD = 1.28$) did not receive less status than either accurate ($M = 4.24$, $SD = 1.23$, $t[71] = 1.69$, $p = .10$, $d = 0.40$, $r = .20$), or underconfident ($M = 4.21$, $SD = 1.49$, $t[71] = 1.71$, $p = .09$, $d = 0.41$, $r = .20$).

## Net status

We next examined whether overconfidence led to net status benefits. The measure of net status showed a positive effect of overconfidence on overall status as afforded by these independent judges, $F(2,112) = 3.56$, $p = .03$, $\eta_p^2 = .06$. Specifically, overconfident individuals ($M = 4.76$, $SD = 1.27$) were afforded higher net status than accurate individuals ($M = 4.10$, $SD = 1.29$, $t[71] = 2.19$, $p = .03$, $d = 0.52$, $r = .25$) and underconfident individuals ($M = 4.02$, $SD = 1.46$, $t[80] = 2.43$, $p = .02$, $d = 0.54$, $r = .26$). This difference in status was material; overconfidence increased net status by approximately one-half a standard deviation. The net status afforded to accurate and underconfident individuals did not differ, $t(73) = 0.25$, $p = .81$, $d = 0.06$, $r = .03$.

## Summary

Study 2 provided participants with explicit information about individuals' confidence and actual ability, and confirmed that overconfident individuals were perceived as overconfident. It used independent observers to rate overconfident individuals' status before and after those individuals' overconfidence was revealed, and it assessed participants' judgments of overconfident individuals immediately after exposing those individuals as being overconfident.

Yet even with this more conservative test, the findings from Study 2 were highly consistent with those from Study 1. Overconfident individuals were initially accorded higher status by independent observers. After observers received information that exposed these individuals' overconfidence, observers did accord overconfident individuals lower status than they gave to individuals with accurate or humble self-perceptions. As a result, overconfident individuals enjoyed higher status than both accurate and underconfident individuals, overall.

## Study 3

Study 3 extended knowledge from the previous studies in two primary ways. First, Studies 1 and 2 examined the status implications of naturally occurring overconfidence, thus precluding strong inferences of causality. Although Study 2 used a quasi-experimental design in assigning participants to different conditions, the targets they viewed on videotape were naturally overconfident, accurate self-perceivers, or underconfident. Study 3 thus manipulated confidence and actual ability with the goal of helping to establish causal priority.

We again used the two-phase design as in Studies 1 and 2. In Phase 1, participants watched a video recording of a person ostensibly part of a small group from a previous experiment. They observed individuals who displayed high or average levels of confidence in their task abilities and rated those individuals on various dimensions. Participants were then informed of the individuals' ostensible actual task performance. In Phase 2, they were asked to rate those individuals again.

However, in the Phase 1 stimuli, we varied the degree to which the individuals in the video recordings were overconfident versus accurate in their self-perceived task performance. Trained actors in the video recordings exhibited either high or average levels of confidence. After participants provided their first set of ratings, the experimenter informed them of the individual's ostensible actual task performance. The individual in the video was reported to perform at either a high or average level on the task. Participants then provided their second set of ratings.

Second, Study 3 conducted a yet more conservative test of our hypotheses by focusing on more extreme levels of overconfidence. In Study 2, overconfident individuals worked in groups of four people, and as a result, could only overplace their relative ability by three or fewer rankings. It is possible that people regard small self-enhancing errors as forgivable sins of optimism (Armor, Massey, & Sackett, 2008). In Study 3, we measured overconfidence and task performance using more general percentile rankings, which allowed for more extreme levels of overconfidence. For example, with percentile rankings, individuals might believe they are in the 90th percentile, even though they rank in the 50th, and thus exhibit a much higher level of overconfidence.

### Method

#### Participants

Participants were 142 volunteers recruited via the Amazon Mechanical Turk web site. They received $1.50 in exchange for participating. Four participants failed our attention checks and were thus excluded from the analyses, leaving 138 participants (57% women). The participants had a mean age of 37 years ($SD = 11.74$). They were 80% Caucasian, 7% African American, 4% Asian, and 7% Hispanic, with 3% reporting other ethnic backgrounds.

#### Design and procedure

The study had a 2 (Confidence: High, Average) × 2 (Task Performance: High, Average) × 2 (Actor Gender: Male, Female) design. Our key comparison was between individuals with high levels of confidence but average task performance (i.e., overconfident individuals) and individuals with average task performance who were aware of it (i.e., accurate self-perceivers). Specifically, we examined how overconfident individuals would be judged in comparison to others with similar competence, but with accurately calibrated self-perceptions. We also used two different actors, one of each gender, to help further establish that our effects held for both genders.

Participants were told they would see a video from a prior research study, in which groups of participants worked together on a person-perception task. Ostensibly, each group from the prior study had received pictures of individuals and estimated those individuals' personality traits. The experimenter told participants they had been randomly assigned to watch one participant from the prior study (the person who was in seat letter "H"). Participants then watched a short video lasting 4 min on average. The video showed a male or female actor displaying high or average levels of confidence. The camera focused on the actor, such that no other person was visible, even though participants were led to believe that the person was working in a small group.

After watching the video, participants completed a survey in which they rated "Person H." These first ratings mimicked those from Phase 1 of the previous studies in that they occurred before the performance feedback was given. Next, the experimenter provided information about the "actual task performance" of Person H. Participants then completed another questionnaire that measured their perceptions of Person H. These ratings thus mimicked those from Phase 2 of the previous studies.

### Manipulation

To manipulate confidence (or self-perceived task ability), we trained the two actors to exhibit high or average levels of confidence in ways outlined by prior research (Anderson et al., 2012; Berger, Webster, Ridgeway, & Rosenholtz, 1986, p. 160; Brinol & Petty, 2003; DePaulo et al., 2003; Ridgeway, 1987, p. 688; Scherer, London, & Wolf, 1973; Shreve, Harrigan, Kues, & Kagas, 1988; Tracy & Robins, 2004). Table 3 summarizes the behavioral cues displayed by the actors.

To manipulate the actors' "actual" task performance, we told participants that Person H had actually performed at high or average levels relative to others. We conducted a pre-test to determine the actual task performance feedback. This was necessary to ensure that confidence and actual task performance ratings closely matched in the accurate conditions (high confidence-high ability, average confidence-average ability). On the basis of confidence ratings given to the videos during pre-testing,[1] we told participants that "Person H performed in the (91st/47th) percentile of the population on the task. That is, (he/she) performed better than (91%/47%) of other people who have completed this task."

### Measures

*Phase 1 self-perceived task ability.* After watching the video, participants reported how confident the individual seemed by indicating how much ability at the task the person believed he or she had, using a scale from 1 *(believes he/she is among the very worst – in the bottom percentile)* to 100 *(believes he/she is among the very best – in the top percentile).*

*Phase 2 perceived overconfidence.* To confirm that participants viewed the overconfident actors as such, we then asked them to rate the actors' overconfidence (vs. underconfidence) using the same scale as in Study 1, which went from 1 *(underconfident: he/she underestimated his/her rank in terms of abilities relative to other group members)* to 7 *(overconfident: he/she overestimated his/her rank in terms of abilities relative to other group members)*, with *accurate* as the mid-point of the scale.

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[1] To obtain data to form the basis for the actual task performance feedback, we conducted a pre-test ($n = 80$) in which people reported how much ability at the task the person in the video believed he/she had, on a scale of 1 *(believes he/she is among the very worst – in the bottom percentile)* to 100 *(believes he/she is among the very best – in the top percentile)*, $M_{average} = 46.7$, $M_{high} = 91.0$, $F(1,76) = 100.29$, $p < .001$.

*Status in the group.* We measured status with four items before and after the performance feedback manipulation was administered. Participants reported how influential they found the target, how much they respected the target, and to what extent they would listen to the target if they were working together, using a scale from 1 *(not at all)* to 7 *(very much)*. They also reported the level of status (i.e., respect, admiration, and standing accorded by the group) they would expect the target to have if they were working together in a group setting, using a scale from 1 *(very low status)* to 7 *(very high status)*. The four items correlated highly (in Phase 1, $\alpha = .90$; in Phase 2, $\alpha = .89$), so we combined them into one measure of status (in Phase 1, $M = 4.32$, $SD = 1.33$; in Phase 2, $M = 4.43$, $SD = 1.20$).

### Results and discussion

#### Phase 1 self-perceived task ability

We first ensured that our manipulation of confidence was effective. In an ANOVA predicting Phase 1 self-perceived task ability with confidence condition and actor gender as between-subjects factors, only a main effect for confidence emerged, $F(1,134) = 228.18, p < .001, \eta_p^2 = .63$. In the high confidence condition, participants believed that the actors perceived themselves to be in the 86th ($SD = 10.68$) percentile in terms of task ability, on average. In the average condition, participants believed the actors perceived themselves to be in the 46th percentile ($SD = 18.72$) in terms of task ability, on average. Neither actor gender, $F(1,134) = 0.35, p = .56, \eta_p^2 = .003$, nor the interaction between actor gender and confidence, $F(1,134) = 0.82, p = .37, \eta_p^2 = .006$, were statistically significant.

#### Phase 2 perceived overconfidence

We then checked that participants accurately perceived the actors' levels of overconfidence after actors' actual task performance levels were revealed. Overconfident individuals ($M = 5.92$, $SD = 0.87$) – those with high confidence and average task performance – were perceived as more overconfident than accurate self-perceivers who performed at the same level ($M = 3.00$, $SD = 1.39$), $t(66) = 10.47$, $p < .001$, $d = 2.58$, $r = .79$. Accurate self-perceivers who performed at average levels were perceived as more confident than those with average confidence and high performance ($M = 2.29$, $SD = 1.19$), $t(68) = 9.37$, $p = .01$, $d = 2.27$, $r = .75$.

#### Phase 1 status

As hypothesized, participants rated the actors' status higher when the actors displayed high levels of confidence ($M = 5.03$, $SD = 1.05$) than when they displayed lower levels of confidence ($M = 3.69$, $SD = 1.24$), $F(1,134) = 46.51, p < .001, \eta_p^2 = .26$. There was neither a main effect of gender, $F(1,134) = 1.23, p = .27, \eta_p^2 = .01$, nor a gender by confidence interaction, $F(1,134) = 0.04, p = .84, \eta_p^2 < .001$.

#### Phase 2 status

An ANOVA using confidence, actual task performance, and actor gender as between-subjects factors revealed an effect of confidence on Phase 2 status, $F(1,130) = 14.71, p < .001, \eta_p^2 = .10$, as well as an effect of actual task performance, $F(1,130) = 4.85, p = .03, \eta_p^2 = .04$. There was no statistically significant effect of gender of the actor, $F(1,130) = 1.36, p = .25, \eta_p^2 = .01$. No statistically significant interactions emerged between actor gender and confidence, $F(1,130) = 0.86, p = .36, \eta_p^2 = .007$, or actor gender and actual task performance, $F(1,130) = 0.09, p = .76, \eta_p^2 = .001$. The interactions between confidence and performance, $F(1,130) = 0.02, p = .90, \eta_p^2 < .001$, and the three variables, $F(1,130) = 2.70, p = .10, \eta_p^2 = .02$, were also non-significant. Mean status ratings by condition appear in Fig. 1.

**Table 3**
Confidence cues exhibited by the actors in Study 3.

| Cue | Condition | | Source |
|---|---|---|---|
| | High confidence | Average confidence | |
| Voice tone | Factual, confident | Factual, with occasional uncertainty | DePaulo et al. (2003), Ridgeway (1987) |
| Voice volume | Medium | Soft | Ridgeway (1987), Scherer, London, & Wolf (1973) |
| Speech tone | Rapid | Slow | Ridgeway (1987) |
| Hesitations | Few, short | Some, longer | Ridgeway (1987), Scherer et al. (1973) |
| Eye contact | High w/normal break-offs (looking mainly at the other person) | Moderate (looking often at the picture) | Ridgeway (1987) |
| Posture | Straight, relaxed, open, with head tilted up on occasion | Straight, with an occasional slump or head tilt down | Ridgeway (1987), Tracy and Robins (2004) |
| Gestures | Few, confidentHead nods "yes" while speaking | Few – some confident, some uncertain; some self- or object-touching | Brinol and Petty (2003), Ridgeway (1987), Shreve, Harrigan, Kues, & Kagas (1988) |

Were overconfident individuals – who exhibited high confidence but had average task performance – afforded lower status in Phase 2 than accurate self-perceives with the same level of task ability (i.e., individuals with average confidence and average task performance)? The analysis indicated that overconfident individuals were not penalized in terms of status. In fact, they were accorded higher status for being confident. In Phase 2, overconfident individuals attained higher status ($M = 4.65$, $SD = 1.04$) than did individuals with average confidence ($M = 3.84$, $SD = 1.08$) but who ostensibly had the same task performance, $F(1, 64) = 8.58, p = .01 \eta_p^2 = .12$. Again, we found neither an effect of gender, $F(1, 64) = 0.40, p = .53, \eta_p^2 = .01$, nor an interaction between confidence and gender, $F(1, 64) = 0.28, p = .60, \eta_p^2 = .004$.

*Net status*

We then examined the effects of each factor on net status. Only confidence emerged as statistically significant, $F(1, 130) = 28.32, p < .001, \eta_p^2 = .18$. Actual task performance, $F(1, 130) = 0.18, p = .67, \eta_p^2 = .001$, and actor gender, $F(1, 130) = 0.94, p = .33, \eta_p^2 = .007$, were not statistically significant, and no interactions emerged (all $p > .12$ and $\eta_p^2 < .02$).

Overconfident individuals were afforded higher net status than individuals with average confidence and the same level of task performance. As hypothesized, overconfident ($M = 4.94$, $SD = 0.96$) individuals were accorded higher status than individuals with accurate self-perceptions of task ability ($M = 3.81$, $SD = 1.10$), $F(1, 64) = 18.12, p < .001, \eta_p^2 = .22$.

*Summary*

The results from Study 3 replicated and extended those from Studies 1 and 2. Study 3 again found that individuals displaying high confidence were afforded higher status in the absence of objective task performance information. The results also replicate the finding that even after participants learned of an individual's overconfidence, they did not penalize that individual with lower status. Instead, highly confident individuals were still accorded higher status than those with the same task performance but more accurate self-perceptions of ability. Accordingly, displaying confidence had a net positive effect on the status afforded to individuals with average levels of task ability. Once again it paid, in terms of status, to be overconfident.

It is important to note that Study 3 replicated the effects of overconfidence on status even when individuals were more severely overconfidence. The overconfident actors grossly overestimated their task performance, ostensibly believing they were better than the vast majority of others when they actually were below average. Moreover, Study 3 used a causal design, helping to establish the causal priority of overconfidence.

**General discussion**

*Summary of findings*

Across three studies, we consistently found that overconfidence had a net positive effect on a person's social status. Individuals who displayed confidence were afforded higher status when others were unaware that the confidence was unjustified by actual task ability. Even after groups gained clear, objective information about individuals' actual task performance, they did not penalize overconfident individuals with lower status—that is, overconfidence did not lead to lower status in the group. Therefore, on balance, the status benefits of overconfidence outweighed its status costs. Overconfidence predicted higher status on average, aggregating across conditions in which groups were unaware that overconfident individuals' lofty self-perceptions were unwarranted and conditions in which groups were made aware that those self-perceptions were unjustified.

We also explored why confidence led to higher net status on balance, even when it was unjustified by actual task performance. We found in Study 1 that peers perceived overconfident individuals to possess better social skill and task ability. Together, the findings demonstrated that overconfidence did not lead individuals to be perceived negatively by peers, but instead more positively – even after being exposed to others as overconfident.

*The origins of overconfidence*

These findings are important for a number of reasons. First, prior research has found that people often exhibit overconfidence—that is, they routinely believe that they are better than others, even when they are not (for reviews, see Alicke & Govorun, 2005 and Dunning et al., 2004). For example, many people overestimate the superiority of their work performance (Cross, 1977; Haun, Zeringue, Leach, & Foley, 2000; Zenger, 1992), social skills (College Board, 1976–1977; Lewinsohn, Mischel, Chaplin, & Barton, 1980; Swann & Gill, 1997), and physical talents (Dunning, Meyerowitz, & Holzberg, 1989; Svenson, 1981; for exceptions, see Kruger, 1999; Moore, 2007). Such overconfidence persists even when the stakes are high and individuals have incentives to estimate their relative abilities accurately (Ehrlinger, Johnson, Banner, Dunning, & Kruger, 2008; Hoelzl & Rustichini, 2005; Williams & Gilovich, 2008).

A critical question is why individuals exhibit overconfidence. The explanation for overconfidence we offer here is that overconfidence provides the individual with social benefits (also see Alexander, 1987; Johnson & Fowler, 2011; Krebs & Denton, 1997; Leary, 2007; Trivers, 1985; von Hippel & Trivers, 2011; Waldman, 1994). Specifically, overconfidence may contribute to higher status.

Recent research has also provided some support for this account by showing that overconfidence can lead to peer-perceptions of greater competence and to the attainment of social status (Anderson & Kilduff, 2009; Anderson et al., 2012). Therefore, biased, overly positive self-perceptions of ability might be common in self-perception because they boost one's social standing.

However, an important counterargument to this status enhancement account of overconfidence is that overconfidence might also pose substantial social risks for the individual. If groups were to discover that an individual's high level of confidence were unjustified, they might penalize that individual by relegating the person to the bottom of the status hierarchy (Tenney et al., 2008). If so, the costs of overconfidence might outweigh its benefits. In this case, it would be difficult to explain the pervasiveness of overconfidence by pointing to its social benefits.

The data presented here undercut this counterargument. We find that overconfidence is still beneficial on net, even after it is discovered. Therefore, the status benefits of overconfidence outweighed the possible status costs.

These results contrast with those of Tenney and her colleagues (Tenney, MacCoun, Spellman, & Hastie, 2007; Tenney et al., 2008). They found that overconfident witnesses lost credibility when they claimed to be 100% confident about something that turned out to be incorrect. One key difference between our approach and theirs is that our studies feature people displaying nonverbal signals of confidence without the explicit and falsifiable claims of being right on a particular item. If, in everyday life, people are more likely to signal confidence through nonverbal and paraverbal signals (Anderson & Kilduff, 2009), then it might be easier to get away with overconfidence than Tenney's results suggest (Sah, Moore, & MacCoun, 2013).

It is important to note how the current research relates to work within the *self-enhancement* tradition, which argues that individuals are driven to be confident because it provides them with psychological benefits (Dunning, Leuenberger, & Sherman, 1995; Kunda, 1987). That work has shown that believing in oneself simply feels good (Marshall & Brown, 2008; Sedikides & Gregg, 2008). For example, self-confidence can improve self-esteem (Alicke, 1985), mental health (Taylor & Brown, 1988), and task motivation and persistence (Pajares, 1996). Therefore, the simple desire for higher self-regard can promote overconfidence.

The *self-enhancement* and *status-enhancement* perspectives of overconfidence do not contradict each other, but might additively help explain the pervasiveness of overconfidence. That is, individuals might be overconfident so often because it makes them feel good about themselves and because it boosts their status. Moreover, the processes highlighted by these two explanations might overlap. For example, by attaining higher status, the individual will likely enjoy higher self-esteem (e.g., Barkow, 1975); and by possessing higher self-esteem, the individual might also attain higher status.

*Implications for status*

These findings also offer two important implications for our understanding of social status. First, they contribute to knowledge of how groups allocate social status. Overconfidence may create illusory perceptions of task ability in observers and these illusions may form the basis for status hierarchies. Past research has questioned functionalist views of status (Lee & Ofshe, 1981; Mazur, 1985) and noted systematic biases in the way individuals infer and judge the contributions of others (Berger et al., 1972; Carli, LaFleur, & Loeber, 1995; Merton, 1968; Ridgeway, 1978; Ridgeway, 1981). For instance, researchers have found individuals to exhibit suspicion regarding females' motivations for contributing to tasks because competent, agentic behavior violates female gender norms (Carli et al., 1995; Ridgeway, 1978; Ridgeway, 1981; Rudman & Fairchild, 2004; Rudman & Glick, 1999). Our research contributes knowledge of an additional factor, overconfidence, which biases the allocation of status. Individuals may be promoted for exhibiting overconfidence, just as they are often promoted for skill at managing impressions rather than their actual leadership skills (for a review, see Kaiser, Hogan, & Craig, 2008).

Second, our findings suggest that status-seeking may have unintended consequences – for instance, overconfidence. Because individuals who seek status may be more likely to attain their goals when they display confidence, over time, the positive reinforcement of this behavior may lead status-seeking individuals to develop habits of thinking and acting confidently, even when their skills cannot justify such confidence (Radzevick & Moore, 2011). This could provide one explanation for why experts update their judgments less often and more slowly than one might expect (Tetlock, 1998; Tetlock, 2005). Like other individuals seeking status advancement through their careers (Wrzesniewski, McCauley, Rozin, & Schwartz, 1997) experts may find it expedient to exhibit overconfidence in their task abilities. This research suggests that status-seeking could have unintended consequences ripe for exploration.

*Strengths, limitations, and future directions*

Our three studies examined overconfidence and status using a variety of methods: natural and manipulated overconfidence and insider and outsider ratings of status. Study 1 examined group insiders' reactions and Study 2 examined outside observers' reactions to naturally emerging overconfidence. Both insiders and outsiders perceived overconfident individuals to have higher status in the group, confirming that individuals generally agree on who has status in groups (cf. Anderson et al., 2006). By examining outside observers' perceptions of overconfident individuals, Study 2 ensured that neither appeasement efforts by overconfident individuals' nor system justification tendencies by groups accounted for the results in Study 1. Study 3 complemented these studies by manipulating overconfidence. It ruled out other third variable concerns and examined overconfidence of greater magnitude than was possible in Studies 1 and 2. Together, the three studies provide strong evidence that groups do not penalize overconfident individuals whose inaccurate self-perceptions are revealed.
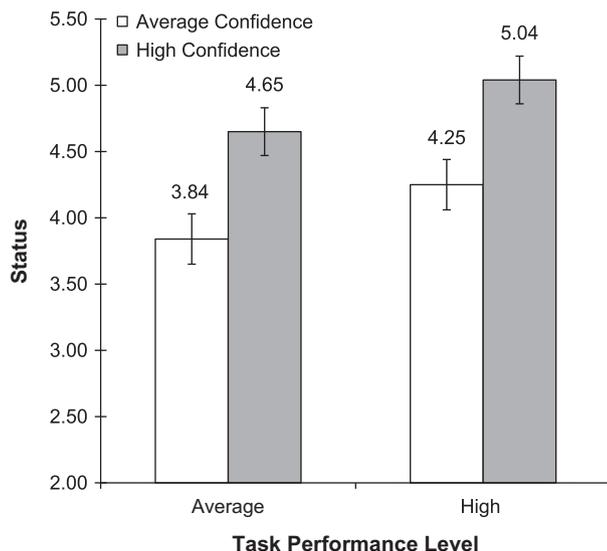


**Fig. 1.** Status ratings in Phase 2 of study 3.

Despite its methodological strengths, this research also has limitations. Because we studied overconfidence in a laboratory setting, the stakes were relatively low. Future research should examine how groups react to overconfidence when the decision stakes are higher and when status carries more extensive benefits.

Nevertheless, there are two ways in which our studies provided a conservative test of whether groups penalize overconfident members. First, in this setting, individuals should have had relatively little hesitation to react negatively to each other. In organizations, individuals must often maintain working relationships long-term and act with cognizance of the social network. Therefore, individuals who interact in temporary laboratory groups with peers who are strangers may be more likely to react negatively to overconfident group members than individuals in real organizations because they have less reason to fear disrupting ongoing relationships.

Second, in this setting, the clear, objective nature of the task and performance feedback should have increased the likelihood that individuals would pinpoint and hold accountable individuals who misled the group regarding their task abilities. Individuals had both the ability and reason to be motivated to determine who deserved influence over task decisions and to adjust status hierarchies accordingly. In contrast, in most organizations, task performance and feedback are rarely so objective. In the world outside the laboratory, detecting overconfidence and seeing its costs may be more difficult and, as a result, overconfidence may have even higher net status value.

Our studies also had a limited duration. Individuals were exposed as overconfident only once. Future work should explore the boundary conditions of the status-enhancement account of overconfidence. Whether groups grow less tolerant of overconfidence when they discover it repeatedly or, conversely, whether they become more likely to rationalize a high status individual's position is an empirical question worth exploring.

Future research should also explore the conditions under which people recognize overconfidence in others. For instance, factors that increase the demonstrability of a task (Laughlin, 1980; Laughlin & Ellis, 1986), such as frames of reference (Bonner, Sillito, & Baumann, 2007), may enhance groups' ability to recognize accuracy and expertise. Conversely, overconfidence may have a stronger relationship with status when group tasks are more judgmental than intellective (Laughlin, 1980). However, notably, this work examined overconfidence in the context of collective estimation tasks, which are intellective (Stasser & Dietz-Uhler, 2001), in order to provide a conservative test of the hypotheses.

Future research could also explore a few of these processes in greater depth. First, it could explore the nature of the positive impressions created by overconfidence. For instance, it could examine whether overconfidence creates only the positive perceptions documented here or a more general halo effect. In addition, research could examine which behaviors manifested by overconfident individuals lead to status attributions. Our studies did not measure these behaviors precisely. By measuring these behaviors, researchers could determine more conclusively whether overconfident individuals are actually more socially skilled in terms useful for groups.

Finally, future research could examine other constraints on overconfidence. Constraints unrelated to status might limit its social benefits (Camerer & Lovallo, 1999; Dunning et al., 2004; Hayward & Hambrick, 1997; Odean, 1998). For example, overestimating one's task abilities might create a tendency to generate unrealistic goals, creating physical or psychological dangers (McGraw, Mellers, & Ritov, 2004). Upon discovering their overconfidence, individuals may also feel an ethical obligation to revise their beliefs. Future research should explore the subjective experience of overconfidence and the constraints that limit its expression.

## Conclusions

These results suggest that overconfidence confers higher social status. When individuals' actual task performance was unknown to others, overconfident individuals were accorded higher social status. Moreover, even when groups received clear, objective data about true task performance, overconfident individuals did not suffer lower status and were in fact still viewed positively. Thus, on net, overconfidence led to status benefits. Our results are consistent with the status-enhancement account of overconfidence. Overconfidence might occur so commonly in part because it provides the individual with higher social status.

## Acknowledgments

## References

Alexander, R. D. (1987). *The biology of moral systems*. Hawthorne, NY: Aldine de Gruyter.

Alicke, M. D. (1985). Global self-evaluation as determined by the desirability and controllability of trait adjectives. *Journal of Personality and Social Psychology, 49*, 1621–1630.

Alicke, M. D., & Govorun, O. (2005). The better-than-average effect. In M. D. Alicke, D. Dunning, & J. Krueger (Eds.), *The self in social judgment* (pp. 85–106). New York, NY: Psychology Press.

Anderson, C., Ames, D. R., & Gosling, S. D. (2008). Punishing hubris: The perils of overestimating one's status in a group. *Personality and Social Psychology Bulletin, 34*, 90–101.

Anderson, C., Brion, S., Moore, D. A., & Kennedy, J. A. (2012). A status-enhancement account of overconfidence. *Journal of Personality and Social Psychology, 103*, 718–735.

Anderson, C. A., John, O. P., Keltner, D., & Kring, A. M. (2001). Who attains social status? Effects of personality and physical attractiveness in social groups. *Journal of Personality and Social Psychology, 81*, 116–132.

Anderson, C., & Kilduff, G. J. (2009). Why do dominant personalities attain influence in face-to-face groups? The competence-signaling effects of trait dominance. *Journal of Personality and Social Psychology, 96*, 491–503.

Anderson, C., Srivastava, S., Beer, J., Spataro, S. E., & Chatman, J. A. (2006). Knowing your place: Self-perceptions of status in social groups. *Journal of Personality and Social Psychology, 91*, 1094–1110.

Armor, D. A., Massey, C., & Sackett, A. M. (2008). Prescribed optimism: Is it right to be wrong about the future? *Psychological Science, 19*, 329–331.

Bales, R. F., Strodtbeck, F. L., Mills, T. M., & Roseborough, M. E. (1951). Channels of communication in small groups. *American Sociological Review, 16*, 461–468.

Barber, B. M., & Odean, T. (2000). Trading is hazardous to your wealth: The common stock investment performance of individual investors. *Journal of Finance, 55*, 773–806.

Barkow, J. H. (1975). Prestige and culture: A biosocial interpretation. *Current Anthropology, 16*, 553–572.

Bass, B. M. (with Bass, R.) (2008). *The Bass handbook of leadership* (4th ed.). New York, NY: Free Press.

Benassi, M. A. (1982). Effects of order of presentation, primacy, and physical attractiveness on attributions of ability. *Journal of Personality and Social Psychology, 43*, 48–58.

Berger, J., Cohen, B. P., & Zelditch, M. (1972). Status characteristics and social interaction. *American Sociological Review, 37*, 241–255.

Berger, J., Webster, M., Ridgeway, C., & Rosenholtz, S. J. (1986). Status cues, expectations, and behaviors. In E. J. Lawler (Ed.). *Advances in group processes* (Vol. 3, pp. 1–22). Greenwich, CT: JAI.

Blau, P. M. (1964). *Exchange and power in social life*. New York: John Wiley & Sons.

Bonner, B. L., Sillito, S. D., & Baumann, M. R. (2007). Collective estimation: Accuracy, expertise, and extroversion as sources of intra-group influence. *Organizational Behavior and Human Decision Processes, 103*, 121–133.

Breland, H. M., & Jones, R. J. (1984). Perceptions of writing skills. *Written Communication, 1*, 101–119.

Brinol, P., & Petty, R. E. (2003). Overt head movements and persuasion: A self-validation analysis. *Journal of Personality and Social Psychology, 84*, 1123–1139.

Brooks, A. W., & Schweitzer, M. E. (2001). Can Nervous Nelly negotiate? How anxiety causes negotiators to make low first offers, exit early, and earn less profit. *Organizational Behavior and Human Decision Processes, 115*, 43–54.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science, 6*, 3–5.

Camerer, C. F., & Lovallo, D. (1999). Overconfidence and excess entry: An experimental approach. *American Economic Review, 89*, 306–318.

Campbell, W. K., Goodie, A. S., & Foster, J. D. (2004). Narcissism, confidence, and risk attitude. *Journal of Behavioral Decision-Making, 17*, 297–311.

Carli, L. L., LaFleur, S. J., & Loeber, C. C. (1995). Nonverbal behavior, gender, and influence. *Journal of Personality and Social Psychology, 68*, 1030–1041.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum.

College Board (1976–1977). *Student descriptive questionnaire*. Princeton, NJ: Educational Testing Service.

Cronbach, L. J., & Furby, L. (1970). How should we measure "change": Or should we? *Psychological Bulletin, 74*, 68–80.

Cross, P. (1977). Not can but will college teaching be improved? *New Directions for Higher Education, 17*, 1–15.

De Cremer, D., & van Knippenberg, D. (2004). Leader self-sacrifice and leadership effectiveness: The moderating role of leader self-confidence. *Organizational Behavior and Human Decision Processes, 95*, 140–155.

DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenbruch, L., Charlton, K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin, 129*, 74–118.

Driskell, J. E., & Mullen, B. (1990). Status, expectations, and behavior: A meta-analytic review and test of the theory. *Personality and Social Psychology Bulletin, 16*, 541–553.

Dunning, D., Heath, C., & Suls, J. M. (2004). Flawed self-assessment: Implications for health, education, and the workplace. *Psychological Science in the Public Interest, 5*, 69–106.

Dunning, D., Leuenberger, A., & Sherman, D. A. (1995). A new look at motivated inference: Are self-serving theories of success a product of motivational forces? *Journal of Personality and Social Psychology, 69*, 58–68.

Dunning, D., Meyerowitz, J. A., & Holzberg, A. D. (1989). Ambiguity and self-evaluation: The role of idiosyncratic trait definitions in self-serving assessments of ability. *Journal of Personality and Social Psychology, 57*, 1082–1090.

Edwards, J. R. (1994a). Regression analysis as an alternative to difference scores. *Journal of Management, 20*, 683–689.

Edwards, J. R. (1994b). The study of congruence in organizational behavior research: Critique and a proposed alternative. *Organizational Behavior and Human Decision Processes, 58*, 51–100.

Edwards, J. R., & Parry, M. E. (1993). On the use of polynomial regression equations as an alternative to difference scores in organizational research. *Academy of Management Journal, 36*, 1577–1613.

Ehrlinger, J., & Dunning, D. (2003). How chronic self-views influence (and potentially mislead) estimates of performance. *Journal of Personality and Social Psychology, 84*, 5–17.

Ehrlinger, J., Johnson, K., Banner, M., Dunning, D., & Kruger, J. (2008). Why the unskilled are unaware: Further explorations of (absent) self-insight among the incompetent. *Organizational Behavior and Human Decision Processes, 105*, 98–121.

Eibl-Eibesfeldt, I. (1989). *Human ethology*. New York, NY: Aldine de Gruyter Press.

Emerson, R. M. (1962). Power dependence relations. *American Sociological Review, 27*, 31–41.

Flynn, F. J., Reagans, R. E., Amanatullah, E. T., & Ames, D. R. (2006). Helping one's way to the top: Self-monitors achieve status by helping others and knowing who helps whom. *Journal of Personality and Social Psychology, 91*, 1123–1137.

Fragale, A. (2006). The power of powerless speech: The effects of speech style and task interdependence on status conferral. *Organizational Behavior and Human Decision Processes, 101*, 243–261.

Gigerenzer, G., Hoffrage, U., & Kleinbölting, H. (1991). Probabilistic mental models: A Brunswikian theory of confidence. *Psychological Review, 98*, 506–528.

Glass, C. R., Merluzzi, T. V., Biever, J. L., & Larsen, K. H. (1982). Cognitive assessment of social anxiety: Development and validation of a self-statement questionnaire. *Cognitive Therapy and Research, 6*, 37–55.

Goldhamer, H., & Shils, E. A. (1939). Types of power and status. *American Journal of Sociology, 45*, 171–182.

Gray-Little, B., & Burks, N. (1983). Power and satisfaction in marriage: A review and critique. *Psychological Bulletin, 93*, 513–538.

Hall, J. A. (1979). Gender, gender roles, and nonverbal communication skills. In R. Rosenthal (Ed.), *Skill in nonverbal communication* (pp. 32–67). Cambridge, MA: Oelgeschlager, Gunn, & Hain.

Harrison, D. A., Price, K. H., Gavin, J. H., & Florey, A. T. (2002). Time, teams, and task performance: Changing effects of surface- and deep-level diversity on group functioning. *Academy of Management Review, 45*, 1029–1045.

Haun, D. E., Zeringue, A., Leach, A., & Foley, A. (2000). Assessing the competence of specimen-processing personnel. *Laboratory Medicine, 31*, 633–637.

Hayward, M. L. A., & Hambrick, D. C. (1997). Explaining the premiums paid for large acquisitions: Evidence of CEO hubris. *Administrative Science Quarterly, 42*, 103–127.

Hoelzl, E., & Rustichini, A. (2005). Overconfident: Do you put your money on it? *Economic Journal, 115*, 305–318.

Johnson, D. D. P. (2004). *Overconfidence and war: The havoc and glory of positive illusions*. Cambridge, MA: Harvard University Press.

Johnson, D. D. P., & Fowler, J. H. (2011). The evolution of overconfidence. *Nature, 477*(7364), 317–320.

Jones, E. E., Rock, L., Shaver, K. G., Goethals, G. R., & Ward, L. M. (1968). Pattern of performance and ability attribution: An unexpected primacy effect. *Journal of Personality and Social Psychology, 10*, 317–340.

Jost, J. T., & Banaji, M. R. (1994). The role of stereotyping in system-justification and the production of false consciousness. *British Journal of Social Psychology, 33*, 1–27.

Kaiser, R. B., Hogan, R., & Craig, S. B. (2008). Leadership and the fate of organizations. *American Psychologist, 63*, 96–110.

Kenny, D. A. (1991). A general model of consensus and accuracy in interpersonal perception. *Psychological Review, 98*, 155–163.

Kenny, D. A. (1998). *SOREMO: A FORTRAN program for round robin data structures*. Storrs, CT: Author.

Kenny, D. A., & La Voie, L. (1984). The social relations model. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 18, pp. 142–182). Orlando: Academic.

Klein, W. M., & Kunda, Z. (1994). Exaggerated self-assessments and the preference for controllable risks. *Organizational Behavior and Human Decision Processes, 59*, 410–427.

Krebs, D. L., & Denton, K. (1997). Social illusions and self-deception: The evolution of biases in person perception. In J. A. Simpson & D. T. Kenrick (Eds.), *Evolutionary social psychology*. Mahwah, NJ: Lawrence Erlbaum.

Krueger, J. I., & Mueller, R. A. (2002). Unskilled, unaware, or both? The better-than-average heuristic and statistical regression predict errors in estimates of own performance. *Journal of Personality and Social Psychology, 82*, 180–188.

Kruger, J. (1999). Lake Wobegon be gone! The "below-average effect" and the egocentric nature of comparative ability judgments. *Journal of Personality and Social Psychology, 77*, 221–232.

Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology, 77*, 1121–1134.

Kunda, Z. (1987). Motivated inference: Self-serving generation and evaluation of causal theories. *Journal of Personality and Social Psychology, 53*, 636–647.

Larrick, R. P., Burson, K. A., & Soll, J. B. (2007). Social comparison and confidence: When thinking you're better than average predicts overconfidence (and when it does not). *Organizational Behavior and Human Decision Processes, 102*, 76–94.

Laughlin, P. R., & Ellis, A. L. (1986). Demonstrability and social combination processes on mathematical intellective tasks. *Journal of Experimental Social Psychology, 22*, 177–189.

Laughlin, P. R. (1980). Social combination processes of cooperative problem-solving groups on verbal intellective tasks. In M. Fishbein (Ed.), *Progress in social psychology*. Hillsdale, NJ: Erlbaum.

Leary, M. R. (2007). Motivational and emotional aspects of the self. *Annual Review of Psychology, 58*, 317–344.

Lee, M. T., & Ofshe, R. (1981). The impact of behavioral style and status characteristics on social influence: A test of two competing theories. *Social Psychology Quarterly, 44*, 73–82.

Lewinsohn, P. M., Mischel, W., Chaplin, W., & Barton, R. (1980). Social competence and depression: The role of illusory self-perceptions. *Journal of Abnormal Psychology, 89*, 203–212.

Littlepage, G. E., Morris, L. W., & Poole, J. R. (1991). Components of state anxiety as mediators of social interference in a coaction situation. *Journal of Social Behavior and Personality, 6*, 377–386.

Littlepage, G. E., & Mueller, A. L. (1997). Recognition and utilization of expertise in problem-solving groups: Expert characteristics and behavior. *Group Dynamics: Theory, Research, and Practice, 1*, 324–328.

Littlepage, G., Robison, W., & Reddington, K. (1997). Effects of task experience and group experience on group performance, member ability, and recognition of expertise. *Organizational Behavior and Human Decision Processes, 69*, 133–147.

Littlepage, G. E., Schmidt, G. W., Whisler, E. W., & Frost, A. G. (1995). An input-process-output analysis of influence and performance in problem-solving groups. *Journal of Personality and Social Psychology, 69*, 877–889.

Lord, R. G. (1985). Social information processing and behavioral measurement: Application to leadership measurement. In B. M. Staw & L. L. Cummings (Eds.), *Research in Organizational Behavior* (Vol. 7, pp. 87–128). Greenwich, CT: JAI Press.

Lord, R. G., de Vader, C. L., & Alliger, G. M. (1986). A meta-analysis of the relation between personality traits and leadership perceptions: An application of validity generalization procedures. *Journal of Applied Psychology, 71*, 402–410.

Malmendier, U., & Tate, G. (2005). CEO overconfidence and corporate investment. *Journal of Finance, 60*, 2661–2700.

Mann, R. D. (1959). A review of the relationships between personality and performance in small groups. *Psychological Bulletin, 56*, 241–270.

Marshall, M. A., & Brown, J. D. (2008). On the psychological benefits of self-enhancement. In *Self-criticism and self-enhancement: Theory, research, and clinical implications* (pp. 19–35). Washington, DC: American Psychological Association.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*, 370–396.

Mazur, A. (1985). A biosocial model of status in face-to-face primate groups. *Social Forces, 64*, 377–402.

McAndrew, F. T. (1981). Pattern of performance and attributions of ability and gender. *Personality and Social Psychology Bulletin, 7*, 583–587.

McGraw, A. P., Mellers, B. A., & Ritov, I. (2004). The affective costs of overconfidence. *Journal of Behavioral Decision Making, 17*, 281–295.

McNulty, S. E., & Swann, W. B. (1994). Identity negotiation in roommate relationships: The self as architect and consequence of social reality. *Journal of Personality and Social Psychology, 67*, 1012–1023.

Merton, R. K. (1968). The Matthew effect in science. *Science, 159*, 56–63.

Metcalfe, J. (1998). Cognitive optimism: Self-deception or memory-based processing heuristics? *Personality and Social Psychology Review, 2*, 100–110.

Moore, D. A. (2007). Not so above average after all: When people believe they are worse than average and its implications for theories of bias in social comparison. *Organizational Behavior and Human Decision Processes, 102*, 42–58.

Moore, D. A., & Healy, P. J. (2008). The trouble with overconfidence. *Psychological Review, 115*, 502–517.

Mullen, B., Salas, E., & Driskell, J. E. (1989). Salience, motivation, and artifact as contributions to the relation between participation rate and leadership. *Journal of Experimental Social Psychology, 25*, 545–559.

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

Neale, M. A., & Bazerman, M. H. (1985). The effects of framing and negotiator overconfidence on bargaining behaviors and outcomes. *Academy of Management Journal, 28*, 34–49.

Odean, T. (1998). Volume, volatility, price, and profit when all traders are above average. *Journal of Finance, 53*, 1887–1934.

Osborne, J. W. (2001). Testing stereotype threat: Does anxiety explain ethnicity and sex differences in achievement? *Contemporary Educational Psychology, 26*, 291–310.

Paese, P. W., & Kinnaly, M. (1993). Peer input and revised judgment: Exploring the effects of unbiased confidence. *Journal of Applied Social Psychology, 23*, 1989–2011.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66*, 543–578.

Paulhus, D. L. (1998). Interpersonal and intrapsychic adaptiveness of trait self-enhancement: A mixed blessing? *Journal of Personality and Social Psychology, 74*, 1197–1208.

Paulhus, D. L., & Bruce, M. N. (1992). The effect of acquaintanceship on the validity of personality impressions: A longitudinal study. *Personality Processes and Individual Differences, 63*, 816–824.

Peltokorpi, V. (2008). Transactive memory systems. *Review of General Psychology, 12*, 378–394.

Plaks, J. E., & Stecher, K. (2007). Unexpected improvement, decline, and stasis: A prediction confidence perspective on achievement success and failure. *Journal of Personality and Social Psychology, 93*, 667–684.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879–891.

Radzevick, J. R., & Moore, D. A. (2011). Competing to be certain (but wrong): Social pressure and overprecision in judgment. *Management Science, 57*(1), 93–106.

Ridgeway, C. L. (1978). Conformity, group-oriented motivation, and status attainment in small groups. *Social Psychology, 41*, 175–188.

Ridgeway, C. L. (1981). Nonconformity, competence, and influence in groups: A test of two theories. *American Sociological Review, 46*, 333–347.

Ridgeway, C. L. (1987). Nonverbal behavior, dominance, and the basis of status in task groups. *American Sociological Review, 52*, 683–694.

Ridgeway, C. L., & Diekema, D. (1989). Dominance and collective hierarchy formation in male and female task groups. *American Sociological Review, 54*, 79–93.

Riggio, R. E. (1986). Assessment of basic social skills. *Journal of Personality and Social Psychology, 51*, 649–660.

Rudman, L. A., & Fairchild, K. (2004). Reactions to counterstereotypic behavior: The role of backlash in cultural stereotype maintenance. *Journal of Personality and Social Psychology, 87*, 157–176.

Rudman, L. A., & Glick, P. (1999). Feminized management and backlash toward agentic women: The hidden costs to women of a kinder, gentler image of middle managers. *Journal of Personality and Social Psychology, 77*, 1004–1010.

Sah, S., Moore, D. A., & MacCoun, R. J. (2013). Cheap talk and credibility: The consequences of confidence and accuracy on advisor credibility and persuasiveness. *Organizational Behavior and Human Decision Processes, 121*, 246–255.

Scherer, K. R., London, H., & Wolf, J. J. (1973). The voice of confidence: Paralinguistic cues and audience evaluation. *Journal of Research in Personality, 7*, 31–44.

Sedikides, C., & Gregg, A. P. (2008). Self-enhancement: Food for thought. *Perspectives on Psychological Science, 3*, 102–116.

Shreve, E. G., Harrigan, J. A., Kues, J. R., & Kagas, D. K. (1988). Nonverbal expressions of anxiety in physician-patient interactions. *Psychiatry, 51*, 378–384.

Sniezek, J. A., & Van Swol, L. M. (2001). Trust, confidence, and expertise in a judge–advisor system. *Organizational Behavior and Human Decision Processes, 84*, 288–307.

Sorrentino, R. M., & Boutillier, R. G. (1975). The effect of quantity and quality of verbal interaction on ratings of leadership ability. *Journal of Experimental Social Psychology, 11*, 405–411.

Sorrentino, R. M., & Field, N. (1986). Emergent leadership over time: The functional value of positive motivation. *Journal of Personality and Social Psychology, 50*, 1091–1099.

Stasser, G., & Dietz-Uhler, B. (2001). Collective choice, judgment, and problem-solving. In M. A. Hogg & R. S. Tindale (Eds.). *Blackwell handbook of social psychology* (Vol. 4, pp. 31–55). Oxford, England: Blackwell.

Steele, C. M. (1997). A threat in the air. How stereotypes shape intellectual identity and performance. *American Psychologist, 52*, 613–629.

Steiner, D. D., & Rain, J. S. (1989). Immediate and delayed primacy and recency effects in performance evaluation. *Journal of Applied Psychology, 74*, 136–142.

Stogdill, R. M. (1948). Personal factors associated with leadership: A survey of the literature. *Journal of Psychology, 25*, 35–71.

Svenson, O. (1981). Are we all less risky and more skillful than our fellow drivers? *Acta Psychologica, 47*, 143–148.

Swann, W. B. (2005). The self and identity negotiation. *Interaction Studies, 6*, 69–83.

Swann, W. B., & Gill, M. J. (1997). Confidence and accuracy in person perception: Do we know what we think we know about our relationship partners? *Journal of Personality and Social Psychology, 73*, 747–757.

Tay, L., & Diener, E. (2011). Needs and subjective well-being around the world. *Journal of Personality and Social Psychology, 101*, 354–365.

Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin, 103*, 193–210.

Tenney, E. R., MacCoun, R. J., Spellman, B. A., & Hastie, R. (2007). Calibration trumps confidence as a basis for witness credibility. *Psychological Science, 18*, 46–50.

Tenney, E. R., & Spellman, B. A. (2010). Complex social consequences of self-knowledge. *Social Psychological and Personality Science, 2*, 343–350.

Tenney, E. R., Spellman, B. A., & MacCoun, R. J. (2008). The benefits of knowing what you know (and what you don't): How calibration affects credibility. *Journal of Experimental Social Psychology, 44*, 1368–1375.

Tetlock, P. E. (1998). Close-call counterfactuals and belief-system defenses: I was not almost wrong but I was almost right. *Journal of Personality and Social Psychology, 75*, 639–652.

Tetlock, P. E. (2005). *Expert political judgment: How good is it? How can we know?* Princeton, NJ: Princeton University Press.

Tracy, J. L., & Robins, R. W. (2004). Show your pride: Evidence for a discrete emotion expression. *Psychological Science, 15*, 194–197.

Trivers, R. (1985). *Social evolution*. Menlo Park, CA: Benjamin/Cummins.

Van Vugt, M. (2006). Evolutionary origins of leadership and followership. *Personality and Social Psychology Review, 10*, 354–371.

Vancouver, J. B., Thompson, C. M., Tischner, E. C., & Putka, D. J. (2002). Two studies examining the negative effect of self-efficacy on performance. *Journal of Applied Psychology, 87*, 506–516.

Von Hippel, W., & Trivers, R. (2011). The evolution and psychology of self-deception. *Behavioral and Brain Sciences, 34*, 1–16.

Waldman, M. (1994). Systematic errors and the theory of natural selection. *The American Economic Review, 84*, 482–497.

Willer, R. (2009). Groups reward individual sacrifice: The status solution to the collective action problem. *American Sociological Review, 74*, 23–43.

Williams, E. F., & Gilovich, T. (2008). Do people really believe they are above average? *Journal of Experimental Social Psychology, 44*, 1121–1128.

Wrzesniewski, A., McCauley, C., Rozin, P., & Schwartz, B. (1997). Jobs, careers, and callings: People's relations to their work. *Journal of Research in Personality, 31*, 21–33.

Zarnoth, P., & Sniezek, J. A. (1997). The social influence of confidence in group decision making. *Journal of Experimental Social Psychology, 33*, 345–366.

Zenger, T. R. (1992). Why do employers only reward extreme performance? Examining the relationships among performance, pay, and turnover. *Administrative Science Quarterly, 37*, 198–219.

Zenker, S., Leslie, R. C., Port, E., & Kosloff, J. (1982). The sequence of outcomes and ESP: More evidence for a primacy effect. *Personality and Social Psychology Bulletin, 8*, 233–238.