

Running head: OVERCONFIDENCE

Overconfidence *at Work*: Does Overconfidence Survive the  
Checks and Balances of Organizational Life?

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## Abstract

This review considers the role of overconfidence in organizational life, focusing on ways in which individual-level overconfidence manifests in organizations. The research reviewed offers a pessimistic assessment of the efficacy of either debiasing tools or organizational correctives, and identifies some important ways in which organizational dynamics are likely to exacerbate overconfidence among individuals. The organizational consequences of overconfidence can be substantial, especially when it comes from those at the top of the organization. However, there are also reasons to suspect that the research literature might exaggerate the prevalence of overconfidence.

*Overconfidence at Work:*

Does Overconfidence Survive the Checks and Balances of Organizational Life?

**1. Guiding Questions**

A great deal of research shows that overconfidence pervades judgments in individual decision making in laboratory experiments. But how does overconfidence affect organizational life? Might organizations have tools to mitigate overconfidence? Or might they actually exacerbate it? In this chapter we review the empirical research on overconfidence and conclude that overconfidence is likely prevalent in organizations. There are some ways that organizations can mitigate or temper it, but people are vulnerable to overconfidence under many conditions, and it can have costly consequences for their organizations.

First we review research on three distinct forms of overconfidence in individual decision making, wherein findings of overconfidence have been robust and consistent; however, we also review boundary conditions, demonstrating that pervasive overconfidence is not a foregone conclusion. We then examine field research on overconfidence and its implications for organizations, discussing potential inhibitors and facilitators of overconfidence. We discuss approaches organizations can take to minimize the dysfunctional consequences of overconfidence and argue that overconfidence in organizations may be, but need not be, as prevalent and problematic as in circumstances of individual decision making. We conclude with a discussion of unanswered questions that could be addressed with additional field research on overconfidence.

## 2. Overconfidence in Individual Decision Making

Overconfidence is a belief about oneself or ones' knowledge that is too extreme or too precise given a comparable, objective benchmark of reality. Overconfidence is often described as rampant in individual decision making: "Perhaps the most robust finding in the psychology of judgment is that people are overconfident" (De Bondt & Thaler, 1995, p. 389). People tend to have unrealistically favorable impressions of themselves compared to others (Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995) and overestimate their abilities and their knowledge (Dunning, 2005). However, research has also identified predictable instances of both underconfidence and good calibration (Burson, Larrick, & Klayman, 2006; Klayman, Soll, González-Vallejo, & Barlas, 1999; Krueger & Mueller, 2002; Moore et al., in press; Moore & Healy, 2008). By emphasizing the prevalence of overconfidence in this review, we do not mean to imply that there is a single, monolithic overconfident attitude that pervades and obscures all judgment. Rather, different types of overconfidence are susceptible to different forces and can be situation-specific. Defining and referring to overconfidence in precise terms is helpful for understanding the nuances and complexities of when overconfidence will and will not be present. Thus, following Moore and Healy (2008), we define three types of overconfidence—overestimation, overprecision, and overplacement—and discuss the separate instances and implications of each.

**Overestimation.** A common approach is to define overconfidence as the overestimation of one's ability, performance, chance of success, or level of control (Moore & Healy, 2008). There are prominent, robust examples of the human tendency to overestimate. For example, students overestimate how well they will perform on exams (Shepperd, Ouellette, & Fernandez, 1996). MBA students overestimate both the number of job offers they will receive and their starting

salaries (Hoch, 1985). The unemployed overestimate how easy it will be to get a job (Spinnewijn, 2015). Even vacationers overestimate how much fun they will have on their vacations (Mitchell, Thompson, Peterson, & Cronk, 1997).

Yet, people do not indiscriminately overestimate all things. When tasks are easy or when the people making the estimates are especially skilled at the task, people tend to underestimate their performance (Burson et al., 2006; Clark & Friesen, 2009; Griffin & Tversky, 1992; Kirchler & Maciejovsky, 2002; Klayman et al., 1999; Kruger & Dunning, 1999; Lichtenstein & Fischhoff, 1977). The powerful moderating effect of task difficulty on overestimation in laboratory studies has been well-documented by cognitive psychologists and is often referred to as the *hard-easy* effect (Benoît & Dubra, 2011; Clark & Friesen, 2009; Kvidera, Koutstaal, 2008; Olsson, Juslin, & Winman, 2008; Van den Steen, 2011). But are most tasks hard or are most tasks easy? The prominence of overestimation is debatable because it is difficult to know whether tasks used in laboratory experiments are representative of the universe of all tasks, or whether a researcher happened to select tasks that produce overestimation (Juslin, Winman, & Olsson, 2000). Moreover, defensive pessimism, sandbagging, and self-handicapping will all lead people to underestimate performance in some circumstances (Arkin & Oleson, 1998; Gibson & Sachau, 2000; Norem & Cantor, 1986).

**Overprecision.** Another operationalization of overconfidence is excessive precision in one's beliefs (for a review, see Moore, Tenney, & Haran, 2016). The standard demonstration of overprecision involves asking participants to provide a confidence interval—a range of values in which participants are confident that the true value resides (Alpert & Raiffa, 1982; Lichtenstein, Fischhoff, & Phillips, 1982). For example, forecasters might predict next year's inflation rate within a 90% confidence interval. If forecasters are well calibrated, 90% of their 90%

confidence intervals will contain the true value. However, true values typically fall within 90% confidence intervals less than 50% of the time, implying overconfidence (Juslin, Wennerholm, & Olsson, 1999; Klayman et al., 1999; McKenzie, Liersch, & Yaniv, 2008; Soll & Klayman, 2004; Teigen & Jørgensen, 2005; Yaniv & Foster, 1997).

The importance of overprecision has been questioned in part because it is strongly affected by how questions are asked, leading to concerns that it may be a methodological artifact. For example, an elicitation method that reduces, and sometimes eliminates, overprecision called the Subjective Probability Interval Estimates (SPIES) method, forces decision makers to consider the full range of possible outcomes in a question set, broken into a series of intervals. Decision makers estimate the probability that each interval includes the correct answer, with the constraint that these probabilities must sum to 100%. SPIES judgments help broaden confidence intervals that follow them (Haran, Moore, & Morewedge, 2010). Though some elicitation methods such as SPIES appear to reduce overprecision, recent behavioral measures aimed at addressing past methodological criticisms continue to find overprecision (Mamassian, 2008). For example, when participants could earn rewards based on asymmetric payoffs, they did not adjust enough to the payoffs, revealing robust overprecision (Mannes & Moore, 2013).

**Overplacement.** A third manifestation of overconfidence is what Larrick, Burson, and Soll (2007) dubbed overplacement: the exaggerated belief that one is better than others. Overplacement is commonly referred to as the “better-than-average” effect. A classic demonstration involves asking participants how good they are at driving compared to others (Sivak, Soler, & Tränkle, 1989; Svenson, 1981; Williams, 2003). One study found that out of

909 licensed drivers, 74% believed that they were better than the average driver (Williams, 2003).<sup>1</sup>

Though numerous studies appear to demonstrate overplacement (Alicke & Govorun, 2005; Alicke et al., 1995; Kruger & Dunning, 1999), there is a profound methodological weakness shared by many of the studies in this literature: vague performance standards. For instance, if researchers ask participants to rate their work performance, participants are likely to differ in how they define work performance. Some salespeople, for instance, may take it as a simple measure of sales volume; others may consider all sales they facilitated or helped with; still others may value their contributions to team morale. These differing construals are perfectly sensible, and if every individual is allowed to define performance subjectively, each one can believe themselves to be the very best, and they can all be correct (Dunning, Meyerowitz, & Holzberg, 1989). Indeed, research demonstrates that people are aware of their idiosyncratic self-assessments (Roy & Liersch, 2013). Note, however, that overplacement can persist even in the face of objective performance standards (Benoît, Dubra, & Moore, 2015).

**Why Definitions Matter.** Findings of overconfidence are often inconsistent: the tasks that find the strongest overplacement tend to produce the greatest underestimation and vice versa (Larrick et al., 2007; Moore & Healy, 2008; Moore & Small, 2007). Moore and Healy (2008) attempted to explain this inconsistency. Their explanation relies not so much on cognitive biases in judgment, but rather on errors—understandable errors to which even perfectly rational people will be prone. Moore and Healy (2008) note that when a task is easy or hard, people's estimations of performance (for self and others) will err in a particular direction. To pick but one example, when asked how long they could juggle three balls in the air, novice jugglers tend to

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<sup>1</sup> Note that although it is impossible for a majority of people to be better than the median, it is possible for the majority to be above average in a skewed distribution (see Harris & Hahn, 2011).



overestimate. At the same time, most appreciate that they are not very good at this difficult task, and it is easy for them to imagine that there are others out there who are much better at juggling (Kruger, 1999). That is, they overestimate self (overestimation) and overestimate others even more so, believing they are worse than others (underplacement).

This error in estimation will occur whenever people have imperfect information about their own abilities or performance, and have even worse information about others' abilities and performance. Because of this, peoples' estimates of themselves will be imperfect (noisy), and their estimates of others even noisier. As a result, when tasks are *difficult*, and performance is low, people tend to overestimate their own performance (overestimation), overestimate others even more so, and thus believe that they are worse than others (underplacement). When tasks are *easy*, and performance is high, people tend to underestimate their own performance (underestimation), underestimate others even more so, and thus believe that they are better than others (overplacement).

### **Summary**

The three forms of overconfidence are distinct from one another and do not represent a single unitary construct. They manifest themselves in different situations and affect different beliefs, choices, and behaviors. Overestimation is greatest on hard tasks, overplacement is greatest on easy tasks, and overprecision is greatest when people assess how likely it is that they are right, such as when using confidence intervals. Conclusions about the magnitude of overconfidence are sensitive to the way beliefs are elicited and measured.

### **3. Inhibitors of Overconfidence**

Though there is copious evidence of overconfidence—especially from the laboratory—a key question is whether overconfidence persists in organizational settings, and if it does, how to

prevent it from causing harm (such as through overly risky decisions). The question of whether human biases pose a problem for organizations is not new. For example, some researchers have argued that racial biases in organizations are kept in check by market forces—the market punishes employers who hire on any basis other than potential to enhance productivity (Epstein, 1995; Smith & Welch, 1986; Tetlock & Mitchell, 2009). Others argue that the existence of racial bias in individuals is problematic in organizational settings (Hoffman, Trawalter, Axt, & Oliver, 2016; Jost et al., 2009). What is the evidence for and against the existence and effects of overconfidence in organizations?

We might hope that debiasing correctives and cognitive repairs could mitigate the effects of overconfidence for organizations (Heath, Larrick, & Klayman, 1998; Staw, 2016). For example, people rarely make important decisions alone, and there is evidence that people who work in teams will catch each other's mistakes and provide each other feedback, potentially enhancing calibration and reducing overconfidence (Tetlock & Mitchell, 2009; Vazire & Carlson, 2011). Feedback can also come in the form of information about performance, letting people know where they stand. There is also a chance that warning people that overconfidence typically occurs could help them avoid bias (Schall, Doll, & Mohnen, 2016). We might also hope that expertise reduces overconfidence. It stands to reason that experts are more fully aware of the limits of their knowledge and abilities, and are thus more accurately calibrated. The following section examines these three potential inhibitors of overconfidence—teamwork, warnings and feedback, and expertise—and concludes that although they have the potential to reduce overconfidence, in practice, they are not always effective.

### **Can Teamwork Reduce Overconfidence?**

Arguably one of the greatest resources of organizations can be found in the wisdom that emerges from workplace interactions and team collaborations. Social interactions and influence could reduce overconfidence for at least three reasons. First, if collaboration with others exposes us to differing viewpoints, we might expect it to moderate extreme views and reduce overprecision. In fact, researchers have found that assigning people to teams in which they could share information can lead individuals to make better-calibrated predictions than those working alone (Moore et al., 2016). Second, when decision makers in an organization were accountable to their teams for their decision processes (e.g., they had to describe how they reached a particular decision to supervisors or peers), they tended to consider more alternatives, which can lead to better-calibrated judgments (Doney & Armstrong, 1997; Lerner & Tetlock, 1999; Simonson & Staw, 1992). Third, people generally want and expect those around them to be well-calibrated rather than overconfident about their knowledge (Tenney & Spellman, 2011; Tenney, Spellman, & MacCoun, 2008), particularly when making important decisions (Tenney, Logg, & Moore, 2015). People like others who have self-knowledge (Tenney, Vazire, & Mehl, 2013). Thus, there are real social incentives to avoid making overconfident claims that could be discredited.

However, teams and social pressure do not always inhibit overconfidence. When people make decisions in groups, there is less accountability and personal responsibility for any given group member than when people make decisions individually (Darley & Latané, 1968; Pruitt, 1971; Vinokur, 1971). This fact could embolden groups to exaggerate without fear of being targeted individually to lose face when (or if) confronted with a less extreme reality. Likewise, when people with diverse information get together, they tend to mostly discuss the information

they share in common (Stasser, 1999; Stasser & Titus, 1985). Thus, people can emerge from group discussions more extreme in their opinions and more adamant in their beliefs than they were before (Dion, Baron, & Miller, 1970; Isenberg, 1986; Moscovici & Zavalloni, 1969). Moreover, groups that sacrifice accuracy for harmony by ignoring contradicting opinions (Janis, 1972) would also be prone to overconfidence.

For example, one way in which organizations get themselves into trouble is by overestimating their future rate of production and therefore over-promising (Flyvbjerg, Bruzelius, & Rothengatter, 2003; Staats, Milkman, & Fox, 2012). Evidence seems to suggest that teams are rarely effective at eliminating this “planning fallacy” (Buehler & Griffin, 2015) and working in teams may even exacerbate overestimation (Buehler, Messervey, & Griffin, 2005). Accountability to peers and supervisors, which we described as one way to reduce overconfidence and extreme, unreasonable views, also can backfire. When others hold people accountable for their decisions, people may feel more compelled to justify them no matter what—leading to even stronger overconfident beliefs—rather than acknowledge their errors and become better calibrated (Lerner & Tetlock, 1999; Robinson & Johnson, 1998). For example, when people commit to an idea publicly, becoming accountable to an audience, they tend to become especially resistant to changing their idea (Kiesler, 1971). Thus, teamwork and social interaction do not necessarily reduce overconfidence.

### **Can Warnings and Feedback Reduce Overconfidence?**

**Warnings.** Another approach that has had mixed effects is warnings. Though past research argued that warnings of overconfidence (e.g., telling participants outright, “Most people are overprecise on this task.”) were not effective in reducing overconfidence (Plous, 1995), recent research demonstrates that structured, repeated warnings can reduce overconfidence by

using a dynamic stimulus change (e.g., a blinking warning) to enhance the warning's salience at the time that it would be most relevant (Schall, Doll, & Mohnen, 2016).

One difficulty counteracting overconfidence with warnings is that doing so properly depends on having an accurate sense of exactly how overconfidence will bias a particular decision. Warning software engineers, for instance, that software development projects usually take twice as long as expected may be effective if indeed every engineer overestimates completion time by 100% (Connolly & Dean, 1997). However, applying a standard corrective is problematic if engineers vary in their overconfidence (e.g., if some engineers overestimate completion time by 100% whereas others overestimate completion time by 25% or 300%).

**Feedback.** There is some evidence that excellent, unambiguous, timely feedback may reduce overprecision in judgment, for example, in forecasting world events (Moore et al., in press) or, famously, in weather forecasting (Murphy & Winkler, 1984). Feedback gives people the opportunity to realize and correct the bias in their confidence estimates. In organizations, there may be opportunities for workers to get feedback, solicited and unsolicited, from other employees (e.g., supervisors' evaluations), from careful tracking of outcomes (e.g., sales), or from post-mortem analyses (e.g., accident or near-accident examinations). In the case that feedback does help, organizations might be well positioned to benefit from its use.

In an early study on performance feedback, participants completed 11 sessions in which they made 200 probability estimates in each session (Lichtenstein & Fischhoff, 1980). After each session, participants received personalized performance feedback (via computer printouts), and then researchers discussed this feedback with the participants for 5-10 minutes. As a result of the sessions, participants became better calibrated, and most of the improvement came after the first session. Similar results have been found in other studies involving probability estimates

of discrete events (Benson, Curley, & Smith, 1995; Bornstein & Zickafoose, 1999; Moore et al., in press). Feedback may be especially effective at reducing overconfidence when the discrepancy between participants' expected performance and their actual performance was large and humbling (Arkes, Christensen, Lai, & Blumer, 1987; Smith & Dumont, 1997).

However, there are several reasons why feedback does not always reduce overconfidence (e.g., Conway & Huffcutt, 1997; Gilovich, Kerr, & Medvec, 1993; Simons, 2013). First, people do not always *want* to be accurate, and so when people receive feedback that could improve calibration, they might willfully ignore it. In some circumstances people explicitly endorse being overconfident (Armor, Massey, & Sackett, 2008). For example, people tend to believe that an overconfident or optimistic mindset (rather than an accurate or realistic mindset) is beneficial to performance, particularly in situations that require effort and persistence. If people believe that overestimating the chance of success can increase motivation and produce better results, they might not pay attention to bias-reducing feedback nor pass it on to their teams. There is good reason to be skeptical that overconfidence can enhance performance (Tenney et al., 2015); nevertheless, if managers do not want to be accurate, and willingly choose to be biased toward overestimation, then feedback will not necessarily eliminate overconfidence.

Second, people might disregard good feedback to justify their commitments to organizations or activities. In one study, 728 football fans made predictions about NFL games (i.e., the winner and point differential) and were rewarded for accurate predictions (Massey, Simmons, & Armor, 2011). Despite the incentives to be accurate, participants' predictions about preferred teams were optimistically biased; they were too sure their favored team would perform well. Their overestimation of their favored team was just as strong after four months of feedback (i.e., seeing who won each game and by how much) as it was after four weeks of feedback.

Likewise, experienced, competitive bridge players overestimated their performance at bridge, despite receiving regular performance feedback (Simons, 2013). When people have a vested interest in seeing the world in a biased way, feedback is not always a sufficient corrective.

As an anecdotal example of the ineffectiveness of feedback, Nobel Laureate behavioral scientist Daniel Kahneman, while serving on a team in the psychology branch of the Israeli Army, assessed and predicted the leadership capabilities of future soldiers (Kahneman, 2011). Every few months his team conducted a feedback session in which they compared their evaluations of the future soldiers with the judgments of their commanders at officer-training school. Each feedback session yielded the same results—their ability to predict performance was negligible. Kahneman remarked that the evidence of their failure should have shaken their confidence in their judgments and motivated them to moderate their predictions; but it did neither, demonstrating that teams can remain overconfident despite receiving corrective feedback.

**Unavailable or biased information acquisition.** Another explanation for overconfidence persisting in organizational settings is that feedback—even if it could help—is often unavailable or delayed. In medicine, for example, diagnostic error is reportedly common (Groopman, 2007). This error manifests itself in excessively confident estimates of the accuracy of a particular diagnosis—overprecision. In an attempt to examine the frequency of misdiagnoses, one study compared antemortem diagnoses with autopsy results from 126 patients who died in the ICU. Clinicians who were “completely certain” of their diagnoses antemortem were wrong 40% of the time (Podbregar et al., 2001). Autopsies not only reveal the presence of diagnostic errors but also provide an opportunity for physicians to learn from their errors. However, the autopsy rate in the United States is probably lower than 10% (Berner & Graber,

2008). So long as feedback is unavailable, clinicians can maintain a distorted view of their error rates.

Workers also vary in the degree to which they seek out and respond to corrective feedback (Ashford, Blatt, & VandeWalle, 2003). Overconfident managers, when gathering information to make a decision, may underinvest in information (compared to rational managers) if they are overly confident in the precision of the information they already possess (Arkes, Dawes, & Christensen, 1986; Goel & Thakor, 2008; See, Morrison, Rothman, & Soll, 2011). This inaccurate assessment of their information would also be expected to impede learning. People who are overconfident about what they are learning may not understand concepts as well as they think they do, thus impeding further study and learning, as errors compound. College students who overestimated what they had learned terminated study earlier than students who were accurate. As a result, their learning and retention was worse (Dunlosky & Rawson, 2012). In the laboratory, participants who received a decision aid to guide their decision making (about which hypothetical juror to select) trusted their intuitive judgments over the decision aid. Thus, the participants performed worse than they would have had they followed the decision aid, yet remained overconfident all the while (Sieck & Arkes, 2005). People need to see the value in seeking feedback for it to be useful, and people who overestimate what they already know may be least likely to do so.

Organizations as a whole do not necessarily respond well when they receive corrective feedback either. For example, one study examined how 217 CEOs responded to feedback they received about their earnings forecasts. When the CEOs learned that their earnings forecasts were incorrect, some firms took responsibility for the error and updated future earnings forecasts,



whereas other firms—those led by overconfident CEOs<sup>2</sup>—blamed external factors and did not update forecasts (Chen, Crossland, & Luo, 2015). Feedback is often readily available and is one of the best possible tools for combatting deleterious effects of overconfidence on risky decisions, but for various reasons it is underutilized.

### **Can Expertise Reduce Overconfidence?**

Organizations are often filled with experts. Workers are hired to fill a niche, to focus on doing their select part extremely well, and to otherwise defer to others working towards the same goal. Moreover, as workers gain knowledge and information, they might be better able to recognize the limits of their own knowledge, which could help them decide when to keep working and when to seek help and advice. Some research posits that, indeed, as expertise goes up, overplacement goes down (Kruger & Dunning, 1999). Thus, if expertise (and role specificity) counteracts overconfidence, then many organizations are well-positioned to not be plagued or derailed by overconfidence, or at least have a clear way forward to circumvent it (e.g., better training to create experts).

Several studies have examined whether experts are better calibrated than novices, and the results indicate that if expertise can reduce overconfidence, it may not do so consistently (for reviews, see Camerer & Johnson, 1997; Koehler, Brenner, & Griffin, 2002). One study compared the confidence intervals of experienced professionals with those of students and found that the experts and novices were equally overprecise, even though the experts and novices both predicted—incorrectly—that experts would be less overprecise than novices (McKenzie et al.,

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<sup>2</sup> Malmendier and Tate (2005) developed a measure of overestimation based on CEO investment behavior. CEOs who possess company stock options are highly exposed to risk because they are typically restricted from selling (and short-selling) company stock. Moreover, their human capital is also invested in their company. Given that risk aversion and underdiversification predict early exercise of profitable stock options, CEOs who choose to not exercise profitable stock options are deemed overconfident. Chen et al. (2015) use this investment-based operationalization of overconfidence, in addition to operationalizations based on CEO press portrayal and firm performance.

2008). In another study, researchers analyzed five thousand confidence intervals of experts in various fields (who made their estimates in their field of expertise) and found that the extent of overprecision among experts was widespread but varied somewhat from field to field—thus, expertise did not eliminate overprecision (Lin & Bier, 2008).

Researchers have tried to increase study participants' expertise experimentally in an effort to reduce overconfidence, also with mixed success. After a 45-minute background lesson on art history, study participants were still overprecise, believing they answered more questions about art history correctly than they actually had (perhaps because participants felt that they had learned more than they actually had in the training) (Stone & Opel, 2000). The process of becoming an expert can make people feel smart and capable, and this boost to confidence can offset the bias-reducing benefits of increased expertise. For instance, researchers, using 5,768 management forecasts made from 1996 to 2007, found that managers who accurately predicted the prior four quarters' earnings were less accurate on future forecasts (i.e., displayed greater divergence from analyst consensus), yet displayed greater certainty in their forecasts (Hilary & Hsu, 2011). Other studies demonstrate that expertise may actually promote, rather than reduce overconfidence. When expertise increases confidence more than accuracy, it can fuel overprecision (Atir, Rosenzweig, & Dunning, 2015).

Among organizations' leaders, might the type of expertise they possess reduce overprecision? In a study of chief financial officers, researchers collected quarterly surveys over a ten-year period (Ben-David et al., 2010). These executives made one-year and ten-year predictions about the S&P 500 return, yielding 13,346 one-year expected returns and 13,058 ten-year expected returns. The executives demonstrated severe overprecision—their 80% confidence intervals contained the true value only 36% of the time. Moreover, executives who

were miscalibrated regarding S&P returns showed similar miscalibration about their own firms' performance. This overprecision appeared to influence financing decisions. Firms with overconfident executives made more aggressive financing decisions, using more debt financing. As Malcolm Gladwell described when writing about overconfidence and the false sense of security among leaders that likely contributed to the financial crisis of 2008, "There is something intoxicating about pure expertise... that emboldens us when we move into the more complex realms. *'I'm good at that. I must be good at this, too,'* we tell ourselves, forgetting that in wars and on Wall Street there is no such thing as absolute expertise, that every step taken toward mastery brings with it an increased risk of mastery's curse" (Gladwell, 2009). Expertise can make people too sure they have the truth.

Expert investors demonstrate overconfidence as well. Researchers surveyed 215 online investors and found a robust relation between overplacement—their belief that they were better than other investors—and trading activity (Glaser & Weber, 2007). In another study, researchers used data from a large population of investor tax filings, driving records, and psychological profiles, and found that, while controlling for variables such as wealth, income, age, number of stocks owned, and occupation, overconfident investors (measured as the residual of confidence and competence, while controlling for competence) indeed traded more frequently than other investors (Grinblatt & Keloharju, 2009). Traders who believe that that they are above-average traders are more likely to believe that they will outperform the market (Anderson, 2013). Laboratory research has also replicated these findings regarding overplacement and trading volume (Deaves, Lüders, & Luo, 2009). Thus, overconfidence among experts is present in organizations, and expertise, rather than inhibiting overconfidence, may sometimes fuel it.

## Summary

We reviewed three potential inhibitors of overconfidence: teamwork, warnings and feedback, and expertise. The evidence on teamwork provides some reason for optimism that collaboration with others can reduce or limit overconfidence; however, we also discussed reasons that team collaboration might not help. Likewise, dynamic, well-timed warnings can reduce overconfidence, but they are difficult to implement effectively. We also find evidence that feedback alone may not eliminate overconfidence in organizations. Competitive bridge players, NFL fans, and military psychologists all continued to be overconfident in the face of multiple rounds of clear and useful feedback. Even if feedback can reduce overconfidence, not all organizational settings provide feedback (e.g., very few autopsies are conducted), not all individuals desire feedback (e.g., overconfident managers underinvest in information acquisition), and not all managers respond well to feedback (e.g., overconfident managers blame failures on uncontrollable factors). Regarding expertise, research indicates that it does not consistently reduce overconfidence, and in some cases, can even exacerbate it.

## 4. Facilitators of Overconfidence

Organizations, while providing some inhibitors of overconfidence, may also provide conditions that counteract inhibitors. Given that not everyone can be high status, a selection tournament emerges for top positions. This selection process may actually promote overconfidence by rewarding those who take big risks and succeed. Consider top management teams; they are made up of people who took risks early in their careers—people who were more optimistic and risk tolerant than the rest of the population (Goel & Thakor, 2008; Graham, Harvey, & Puri, 2013). Like top managers, entrepreneurs are the set of risk-seekers who, having heard the grim statistics on failure rates, are still so confident that they choose to start businesses

anyway (Cain, Moore, & Haran, 2015). Moreover, people are more likely to be overconfident than underconfident about activities they choose to pursue (Van den Steen, 2004), and so those who are especially confident in their management abilities are more likely to pursue management careers (Gervais, Heaton, & Odean, 2011). Thus, there are a number of ways in which organizations might be inadvertently selecting for and rewarding overconfidence. A desire to win power or status within a group or team may further motivate overconfidence. Groups prefer capable leaders, so it would make sense that they would select the most confident contenders, provided confidence is a useful signal of ability. Much of the time, it is (Mabe & West, 1982). In group decision making, individuals who were the most optimistic and confident tended to be the most influential (Bonner & Bolinger, 2013). However, this very fact opens the way to possible exploitation by pretenders. If simply acting confident is enough, then the confidence enacted by fakers and phonies will give them a better chance of getting promoted or elected (Anderson, Brion, Moore, & Kennedy, 2012). It is not that people don't care about accuracy—they do. If people can verify whether an individual's confidence is merited, there is the distinct risk that overconfidence can be discovered and the person discredited (Tenney, MacCoun, Spellman, & Hastie, 2007). The problem is that organizational life affords imperfect systems for verifying accuracy. Confident managers on the fast track have often been promoted into other positions by the time their old teams fall short of the overconfident goals set for them.

In addition to overconfidence getting mistaken for true competence, leading to status, individuals can sometimes win selection or status tournaments because overconfidence gets perceived as desirable lack of conservatism. In a study in which hypothetical weather forecasters made cautious or extreme predictions, people evaluating the forecasters preferred the more extreme one, even when the forecasts turned out to be too extreme, revealing overconfidence.

According to the researchers, people likely “took such [cautious] judgments as indications the forecasters were either generally incompetent, ignorant of the facts in a given case, or lazy, unwilling to expend the effort required to gather information that would justify greater confidence” (Yates, Price, Arbor, & Li, 1996, p. 45). Indeed, at times, a cautious prediction could signal complacency, whereas an extreme one could signal passion.

It is also worth noting that the very process by which leaders attain their top positions might encourage them to believe that they have superior intuitions (Chatterjee & Hambrick, 2007; Hayward & Hambrick, 1997; Malmendier & Tate, 2005). Consistent with the self-attribution bias, in which people take outsized credit for their successes while attributing failures to external factors (Kahneman & Tversky, 2000), successful CEOs attribute their success to their own abilities, rather than other factors such as good fortune (Daniel, Hirshleifer, & Subrahmanyam, 1998). For example, a study examining managerial self-attribution bias in mergers and acquisitions found that after a successful first merger, CEOs were more likely to acquire another company, even though these subsequent deals were worse. Moreover, in subsequent deals, CEOs’ net purchase of stock was greater than it was for first deals, suggesting that they were more optimistic about the deal’s benefits (Billett & Qian, 2008). This, despite the fact that the stock market more often reacted negatively, suggesting that investors were less optimistic. The researchers concluded that overconfidence, driven by self-attribution of success, played a role in acquisition decisions.

On a much broader scale, the tournament of natural selection may also contribute to the level of overconfidence in field settings. In a competition for resources, individuals claim resources based on their perceived capability compared to the perceived capability of competitors. If claimants are able to deter competitors by having exaggerated beliefs about their

strength relative to that of others, claimants will secure resources without fighting for them, the optimal outcome for claimants. Overconfidence is thus advantageous for individuals so long as it allows people to claim resources they otherwise would not win in conflict, and it ensures that they won't walk away from conflicts that they will win. If the costs of failure associated with overconfidence are less than the missed opportunities associated with accuracy or underconfidence, overconfidence in organizations will persist (Johnson & Fowler, 2011).

### **Summary**

Organizations may exacerbate overconfidence through selection tournaments and by creating situations that enhance self-serving attributions. Top management teams are made up of risk takers, and individuals who are especially confident in their management abilities are more likely to pursue management careers. Managers in general are more likely to be overconfident than the general population, and overconfident managers have a leg up in the tournament of organizational promotion. Moreover, leaders who over-attribute their success to their own abilities and under-appreciate the role of good fortune are likely to become overconfident.

## **5. Does Overconfidence Affect Organizations?**

We have argued that the checks and balances of organizational life may not be sufficient to rid organizations of overconfidence; in fact, organizations may actually facilitate overconfidence. If overconfidence is indeed present in organizations, does overconfidence meaningfully affect organizations? In the following section, we review evidence indicating that overconfidence can have large and lasting effects on the success of organizations, specifically through the behavior of overconfident leaders. We also consider ways in which organizations can exploit individual overconfidence.

**Overconfident Leaders.**<sup>3</sup> Overconfident CEOs can make aggressive, risky, and sometimes value-destroying financial decisions. One study of 394 large, publicly traded U.S. firms found that the odds of making a value-destroying acquisition were 65% higher for overconfident CEOs (Malmendier & Tate, 2008).<sup>4</sup> Another study analyzed data from publicly listed U.S. banks from 1994-2009 and found that overconfident CEOs were more likely to weaken lending standards and increase leverage in advance of a crisis compared to other CEOs (Ho, Huang, Lin, & Yen, 2016), presumably because the overconfident CEOs overestimated the probability of positive outcomes, and underestimated the downside risk of projects (Gervais et al., 2011). As a result, these U.S. banks generally experienced more loan defaults, larger drops in stock returns, and poorer operating performance (Malmendier, Tate, & Yan, 2011). Thus, CEO overconfidence can lead to ill-fated acquisitions, lax lending standards, and may ultimately put the firm at risk through aggressive financing decisions.

Overconfident CEOs are more willing to pursue risky (and potentially innovative) projects. One study analyzed 290 publicly traded companies and 627 CEOs (from the years 1980 to 1994) and found that the arrival of an overconfident CEO was correlated with a 25%-35% increase in citation-weighted patent counts (Galasso & Simcoe, 2011). Other research demonstrates a similar, positive relationship between overconfidence and innovation (Engelen, Neumann, & Schwens, 2015; Hirshleifer, Low, & Teoh, 2012<sup>5</sup>; Simon & Shrader, 2012<sup>6</sup>). Consistent with these findings, firms led by overconfident CEOs had greater stock return

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<sup>3</sup> The majority of studies in this section use the Malmendier and Tate (2005) investment approach described in footnote 2—or a variation close to it—to operationalize overconfidence. Studies that use additional or different operationalizations are noted via footnotes.

<sup>4</sup> Researchers used CEO press portrayal in addition to CEO investment behavior (Malmendier & Tate, 2005) to operationalize overconfidence (i.e., overestimation).

<sup>5</sup> Researchers used CEO press portrayal in addition to CEO investment behavior (Malmendier & Tate, 2005) to operationalize overconfidence (i.e., overestimation).

<sup>6</sup> Researchers compared CEO predicted performance with actual performance 18 months later to operationalize overconfidence (i.e., overestimation).



volatility (Hirshleifer et al., 2012). Thus, overconfidence may correspond with greater innovation and riskier decisions. Whether these risks are good or bad depends on the industry and market forces (Staw, 1995).

Overconfident executives may also be at enhanced risk for committing accounting fraud. Researchers examined 49 firms, from the 1990s and 2000s, that were flagged by the SEC for having accounting-related violations (i.e., accounting misstatements; Schrand & Zechman, 2012). Of the 49 firms, a quarter were found to have committed outright fraud (i.e., reported fake revenue or hid debt off the balance sheet). However, in the case of the other three quarters, evidence suggests that executives' initial misstatements may simply have reflected overestimation (Hribar & Yang, 2015<sup>7</sup>; Libby & Rennekamp, 2012<sup>8</sup>). Then in subsequent periods, these executives felt compelled to continue misstating earnings to match their initial misreporting (these subsequent misstatements violated securities laws). Thus, if not for the initial overestimation, these firms may have never violated the law. A further analysis of two matched samples found evidence of a positive association between overconfidence and the propensity for accounting misstatements, suggesting that, in fact, overconfident executives were more likely to overestimate earnings in the first place. These findings are consistent with other research demonstrating that managerial overestimation leads to less conservative accounting practices, and external monitoring (i.e., outside directors on the board) did not mitigate the effect (Ahmed & Duellman, 2013).

Overconfident military leaders can also make especially risky decisions. Overplacement is sometimes useful in deterring rival forces by exaggerating one's superiority (e.g., signaling

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<sup>7</sup> Researchers used CEO press portrayal in addition to CEO investment behavior (Malmendier & Tate, 2005) to operationalize overconfidence (i.e., overestimation).

<sup>8</sup> Researchers compared participants' predicted performance with actual performance on a ten-item confidence-interval task to operationalize overconfidence (i.e., overprecision).

that one occupies a stronger position than one actually does; Burks et al., 2013; Johnson & Fowler, 2011). But erroneously believing that your side is stronger can be dangerous. Anecdotal examples are legion, such as General George Custer exclaiming to his 200 men at Little Big Horn, “Hurrah, boys we’ve got them!”—after which all 200 men were killed by 3000 Sioux and Cheyenne warriors. Or when Israeli chief of staff David Elazar exclaimed to his men before the Yom Kippur war, “We’ll have one hundred tanks against their eight hundred... That ought to be enough.” Or remember U.S. military strategist Ken Adelman’s 2002 forecast that “liberating Iraq would be a cakewalk” (Johnson, 2009, p. 2). Perhaps it is unsurprising that potential foes’ estimates of their chance of success often sums to more than 100% (Johnson, 2009). Moreover, several researchers even argue that overconfidence is a primary cause of war (Johnson et al., 2006). A recent RAND study found evidence of both overestimation and overprecision regarding war: even limited wars tend to last longer and cost more than expected (Lorell & Kelley, 1985). Thus, overconfidence, specifically when manifest in powerful people, can have enormously consequential effects on organizations and nations.

### **Exploiting Overconfidence**

There are some ways in which organizations may benefit from individual overconfidence. For instance, organizations can structure performance incentives for employees to exploit overconfidence in their own future performance. Sales people who overestimate their own future sales performance will be too willing to accept incentive contracts that offer generous rewards for levels of performance they are unlikely to attain (Larkin & Leider, 2012). Indeed, research demonstrates that firms exploit overconfidence by offering overconfident employees incentive-heavy compensation contracts (Humphery-Jenner, Lisic, Nanda, & Silveri, 2016). Firms can exploit overconfident employees at every level; overconfident CEOs ultimately receive less total

compensation than their peers because they receive fewer bonus payments and smaller stock option grants than their peers (Otto, 2014).

Some firms can also stand to benefit from their own customers' overconfidence. When individuals overestimate their future discipline and virtue, they will overestimate the frequency with which they will need gym facilities for exercise. And gyms can take advantage of this excessive optimism (DellaVigna & Malmendier, 2006). Credit card companies, for their part, structure their contracts with customers to exploit customers' overestimates of their ability to pay off the monthly balance (DellaVigna & Malmendier, 2004). Of course there are many other domains in which organizations have little incentive to debias overconfidence, including consumers' forecasts of the need to save for retirement, to avoid unhealthy snacks, or their chances of beating the market with their investments. However, exploiting customers' and employees' biases for short-term financial gain could cause long-term harm for the organization (e.g., more stressed-out or disappointed employees).

### **Summary**

Overconfidence is present in and affects organizations. Overconfident leaders pursue risky acquisitions and strategies, which can affect the long-term viability of organizations. Overconfidence may also contribute to the most deleterious of outcomes, such as fraud or even war. However, there are also numerous instances in which organizations stand to benefit from the overconfidence of their employees and their customers.

## **6. Organizational Remedies**

If overconfidence is present in and affects organizations, how do organizations deal with overconfidence? We consider how organizations can plan for and compensate for

overconfidence. Namely, organizations can conform to standards set by regulators and external monitoring, and they can try to anticipate overconfidence and confine it to certain sectors.

**External Monitoring.** One way to compensate for overconfidence is to increase regulation and external monitoring. For example, although some individuals may not seek out feedback, a system that automatically provides feedback to individuals (via reports from independent auditors) and holds them accountable for their decisions could potentially help minimize overconfidence's reach. In 2002, congress passed the Sarbanes-Oxley (SOX) Act. The act was intended to improve corporate governance by increasing transparency and accountability (Coates, 2007). The act requires a fully independent audit committee and a majority of directors to be independent. Researchers found that investment choices made by overconfident CEOs became significantly less aggressive after the passage of SOX (Banerjee, Humphery-Jenner, & Nanda, 2015). Overconfident CEOs reduced risk exposure and increased post-acquisition performance. Moreover, as a comparison, these benefits did not accrue to firms that were compliant prior to the 2002 changes. Other research provides support for the benefits of strong, independent boards. Independent boards reduced the acquisitiveness of overconfident CEOs (Kolasinski & Li, 2013). Thus, external monitoring can reduce the negative consequences of overconfidence under some circumstances.

However, external monitoring is not a panacea—how and when the monitoring is conducted apparently matters. External monitoring does not appear to make CEOs more conservative in their accounting practices (Ahmed & Duellman, 2013), and the governance structures of firms that misreport earnings are very similar to governance structures of those that do not (Schrand & Zechman, 2012). Finally, a study found that firms with risk management officers actually committed more risky decisions, as measured by debt to equity ratios (Stimmler,

2011). Thus, future research could try to more clearly identify the conditions under which external monitoring and accountability reduce overconfidence.

### **Compensation**

Given the difficulty of debiasing individuals, organizations may simply accept and plan for overconfidence. For example, organizations with risk-averse principals might actually prefer to select overconfident agents for strategic interactions to help diversify aggregate risk (Heller, 2014). Other companies might hire overconfident individuals to positions in sales and marketing, where possible externalities of overconfidence like persistence and persuasiveness can serve workers well, and hire well-calibrated individuals to positions in engineering or accounting, where accuracy might be more valued. Of course, this practice could be a source of the conflict that often arises within organizations when salespeople overpromise on specs and delivery dates, and people in production cannot meet these overly optimistic projections.

But this conflict can be managed. For example, some companies explicitly add a “safety margin” to planned project completion times to take into account overconfidence due to the planning fallacy (Heath et al., 1998). And market analysts learn to react less strongly to forecasts when they are issued by overconfident managers (Hilary & Hsu, 2011). Thus, the focus is not on eliminating overconfidence; rather, organizations recognize the presence of overconfidence and adjust accordingly.

### **Summary**

Organizations can sometimes compensate for overconfidence by acknowledging the likely presence of overconfidence and then bracing for it or adjusting to it, accordingly.

## 7. Future Research Directions

Overconfidence is commonplace in individual decision making. According to evidence we review here, overconfidence is likely prevalent in organizations as well. This review has identified ways in which organizations may contribute to individual overconfidence. Sometimes this overconfidence can harm organizations, such as when overplacement leads to value-destroying mergers or reckless military escalations; when overestimation contributes to overly optimistic earnings estimates, overly aggressive financing, or accounting fraud; and when overprecision leads to excess trading volume. But other times organizations can exploit individual overconfidence, such as when organizations structure incentive contracts for sales agents that overestimate their future sales performance or for customers who overestimate their future self-control. How organizations cope with overconfidence bias, considering short-term and long-term consequences, is ripe for additional future research.

Another avenue for future research centers on the tension between internal beliefs and external displays of confidence. We have noted the potential benefits of displaying confidence to naïve others, including greater influence, greater perceived credibility, and greater status. It is also potentially useful for intimidating or scaring off rivals. However, these benefits highlight the commensurate dangers to those who believe their own propaganda and who “drink the Kool-Aid.” Organizations should prefer to capitalize on the benefits of confident displays while remaining circumspect and rational in their decision making. The entrepreneur seeking outside funding should display boundless optimism about the venture’s future potential; but the decision to max out their own credit cards and borrow money from relatives might not be so wise. This, then, highlights the difficulty and potential hypocrisy of maintaining different beliefs than one

endorses publicly and underscores the potential value of self-deception (von Hippel & Trivers, 2011).

One challenge highlighted by our review is the difficulty studying these complexities *in situ* rather than in the experimental laboratory. The lab affords experimental control and precise measurement that makes it easier to specify precisely when people are more confident than they deserve to be. After all, before we can identify anyone as being overconfident, it is necessary to determine how confident they ought to be. That is possible when we ask experimental participants to estimate their percentile rankings relative to other participants for the sake of computing overplacement. However, it is harder to infer from a CEO's acquisition decisions exactly how much better than others they believe themselves to be. And even when people appear superficially overconfident, it is possible that their beliefs are rationally justified (Benoît & Dubra, 2011; Harris & Hahn, 2011).

Yet despite its methodological advantages, the lab necessarily oversimplifies the complex organizational dynamics around the causes and consequences of overconfidence. The mix of incentives, circumstances, and long-term consequences that promote or impede overconfidence in field settings can be hard to emulate precisely in the lab. Employers hold employees accountable for performance (e.g., employers base promotions and compensation on performance) in ways that experimenters may have difficulty simulating with lab participants. Even employees can hold other employees accountable via competition for intra-office resources (e.g., overly optimistic proposals by one employee would be subject to the criticisms of rival employees; Staw, 2010); lab participants do not often have the opportunity to exercise the same influence over their counterparts. Moreover, field research demands that researchers go beyond subjective verbally-labeled scales on self-report surveys and compare confident beliefs and

behaviors with the underlying reality of actual performance, ranking relative to others, and accuracy.

## CONCLUSION

We conclude by offering three specific reasons for hope that overconfidence might not be as prominent and damaging as it may seem in the evidence we reviewed. First, research finding overconfidence may be more likely to make it to print than is research demonstrating good calibration. This is because good calibration often manifests itself as a null result: no difference between the observed decisions and what we would expect if people behaved rationally. Thus, the published record may well overstate the prevalence of bias. Second, research results might be biased in favor of finding overconfidence because researchers, knowing that null results are likely not publishable, search in places where they think they can identify overconfidence. For example, the rank-and-file of organizations may not experience the same selection forces as executives and managers, making them less prone to overconfidence. Moreover, given the broad distribution of task difficulty in and between organizations, we would expect to see greater overconfidence in some pockets of organizational life than others.

Third, selection effects are likely to exacerbate the observed rate of overconfidence. If those who choose to start new firms are those most overconfident of their chances of success, we will observe overconfidence among entrepreneurs, even if, taken as a whole, the population of potential entrepreneurs is unbiased. If those who compete and triumph in the promotion tournament of organizational leadership are those who are most overconfident about their chances of winning, we will observe overconfidence among CEOs even if, taken as a whole, the population of would-be leaders is not overconfident.



Researchers' fascination with identifying the presence of overconfidence in organizational life has successfully established a scientific consensus that people, and the organizations they inhabit, are routinely overconfident. We anticipate that this consensus might eventually highlight the value of identifying the ways in which people and organizations can instead be well-calibrated or even underconfident at work.

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