

# The Dark (and Light) Sides of Overconfidence

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## A. Definition and Background

In the single deadliest accident in Mount Everest's history, an avalanche fell on a group of 50 climbers in 2004, killing 12 and wounding more. Since 1950, more than 800 people have died during attempts to scale the Nepali Mountains, including Everest. Thousands more have suffered injury in pursuing the same goal (Salisbury & Hawley, 2011). Presumably few of those who have been injured or died expected their venture to end in tragedy. Had they anticipated these outcomes, they might have found other ways in which to spend their time. Everest stands as a particularly salient example of the sometimes deadly consequences of overconfidence.

In its broadest form, overconfidence can be defined as an overly positive perception of oneself relative to some comparison standard. Overconfidence refers to the tendency for individuals to view themselves more favorably than others, hold unrealistically high opinions of their own positive traits and abilities, possess overly high estimates of the likelihood that they will experience primarily positive events in the future, and have unrealistically high impressions of the accuracy of their beliefs and opinions. Perhaps the most well-known findings in the literature on overconfidence are the tendencies for people to view themselves as consistently Better-Than-Average with respect to their intellectual abilities (Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995), job performance (e.g., Harrison & Shaffer, 1994; Oksam, Kingma, & Klasen, 2000), and social skills (College Board, 1976-1977). For example, in one company, 42% of engineers rated their work in the top 5% relative to their peers (Zenger, 1992). Similarly, on average, 90% of drivers rate themselves as above average in their driving ability (Svenson, 1981). Although some people are, presumably, smarter and/or more productive than the average person, it is statistically impossible for greater than half of the relevant population to be "above average" for any given dimension.

As the literature on the Better-Than-Average effect suggests, people routinely view themselves in more positive terms than can be justified given objective metrics. In this chapter, we discuss when and why people tend to be overconfident, as well as the adaptive and maladaptive features of this robust characteristic of self-assessments.

## **B. Review of the Relevant Literature**

Overconfidence has been operationally defined in multiple ways by different researchers. The Better-Than-Average effect is perhaps the best-known example of what Moore and Healy (2008) have categorized as *overplacement* in a recent review of the literature on overconfidence. Overplacement is defined as an overly positive perception that one is superior to others in a given domain. This can be contrasted with *overestimation*, which is defined as a person's exaggerated perception of his or her own ability or chance of success relative to an objective measure. Finally, Moore and Healy define *overprecision* as undue confidence in the accuracy of one's beliefs. We use these categories to summarize the literature on overconfidence.

Overplacement has been demonstrated in studies that measure (1) people's perceptions of how they have performed relative to a specific reference group (e.g., one's classmates) and (2) how well participants and others in the relevant reference group have actually performed. People also show significant patterns of overplacement when evaluating their performance on academic exams, their ability to evaluate jokes, and their performance in debate competitions (e.g., Ehrlinger, Johnson, Banner, Kruger, & Dunning, 2008; Kruger & Dunning, 1999).

Whereas overplacement refers to overconfidence in perceptions of how one compares to other people, *overestimation* refers to the tendency to evaluate one's performances, skills, and/or personal qualities more positively than can be justified when compared to an objective score or reference point. For example, a student might estimate that he performed well on an exam,

answering at least 95% of the questions correctly. If this student answered only 70% of the questions correctly, the student can be said to have overestimated the quality of his test performance. Indeed, past research suggests that students often overestimate the quality of their test performances (Ehrlinger et al., 2008). Overestimation is also common in people's judgments of how they are seen by others. In particular, people tend to overestimate the degree to which others describe their personality in positive ways (Malloy & Janowski, 1992). People also tend to overestimate the degree to which they have control over other people, external variables, and even chance-based events (Langer, 1975). Overestimation is also prevalent when predicting one's own future behavior. We expect that we will behave more charitably (Epley & Dunning, 2000) and that we will be more productive (Buehler, Griffin, & Ross, 1994) than often turns out to be the case.

Finally, the third type of overconfidence identified by Moore and Healy (2008) is *overprecision* – the tendency to have undue confidence in the accuracy of one's judgments or estimates. To quantify overprecision, researchers ask participants to provide a numerical estimate of, for example, the size of a city or the number of weeks it might take to complete a project. Participants are also asked to create a confidence interval around their estimate by naming the lowest likely value for their estimate and the highest likely value. This literature suggests that people tend to be vastly overconfident in the precision of their judgments and beliefs. For example, one study asking traders to estimate 90% confidence intervals of stock prices six months in the future found that fewer than 50% estimated an interval that contained the eventual stock price (Deaves, Lüders, & Schroder, 2010). Even when offered feedback, individuals tend to adjust their confidence only marginally, and not nearly as much as they should (Mannes & Moore, 2013).

### *Causes of Overconfidence*

There are at least two broad types of explanations for the frequency with which self-assessments are overly positive. First, it just feels good to think well of the self. People see themselves as better than most others, to some degree, because they are motivated to believe positive things about the self (Taylor & Brown, 1988). Consistent with this explanation, the Better-Than-Average effect is seen most often for characteristics that are viewed as highly desirable (Alicke, 1985) and important (Brown, 2012). In other words, people tend to be most overconfident in exactly the ways that might feel the best.

Despite the tendency for overconfidence, few of us believe that we are Einstein's intellectual equal or that our singing and dancing abilities merit a career on Broadway. As much as it feels nice to believe positive things about ourselves, this motivation is tempered by the day-to-day feedback that most of us receive suggesting that we are not perfect. Although we cannot completely ignore the presence of negative feedback in our lives, people do hold negative information about the self to a higher standard than positive information. We more often pay attention to (Ehrlinger & Dweck, 2014), remember (Kunda, 1990), and give greater weight to (Dunning, Meyerowitz, & Holzberg, 1989) flattering over unflattering information. These practices make it easier to maintain overly positive views of the self.

A second category of explanations for the frequency of overconfidence in self-assessments relates to important social cognitive features of how the mind works. For example, confidence judgments are strongly anchored by whatever information is more focal for the individual at the time of judgments. People tend to give too much weight to their own experiences and too little weight to the likely experiences of others when making judgments about how their own performance or likely outcomes might compare to that of other people

(Chambers & Windshitl, 2004). This cognitive bias leads to tendencies to view oneself as above average for easy tasks. People anchor on the fact that a task is easy for them and give too little weight to the fact that this same task is likely easy for others (Kruger, 1999).

### *Individual Differences*

One important way of discovering additional contributors to overconfidence is to identify which individuals tend to show the most overconfidence and use this knowledge to understand how these individuals differ from those showing less overconfidence. Kruger and Dunning (1999) discovered that those who lack skill tend to be far more overconfident than their more competent peers. A particularly troubling example of this tendency is that gun owners performing in the bottom quartile on a test of gun use and safety rated their test performance as above average relative to their gun-owning peers (Ehrlinger et al., 2008). The primary reason that those who lack skill remain grossly overconfident is that they lack the knowledge necessary to recognize when they are mistaken and in what ways they need improvement.

Using a similar individual differences approach, Ehrlinger and Dweck (2014) discovered that people's beliefs about the malleability of intelligence have an important impact on rates of overconfidence. People who view intelligence as fixed account for most of the overconfidence effect for academic performances, whereas those who view intelligence as malleable make far more accurate self-assessments. People with a fixed view of intelligence feel more threatened by feelings of difficulty than those with a malleable view (e.g., Blackwell, Trzesniewski, & Dweck, 2007). For this reason, those with a fixed view allocate their attention away from challenging portions of tasks and toward easier questions. This practice leaves fixed theorists overconfident in the quality of their performances whereas malleable theorists hold more accurate perceptions of their work (Ehrlinger & Dweck, 2014).

### *Underconfidence*

Although underconfidence is far less common than overconfidence, there are several important instances in which underconfidence reliably occurs. One of the most troubling examples of underconfidence is the tendency for women and underrepresented minorities to lack confidence in their abilities to succeed in important science, technology, engineering, and math (STEM) domains. From a young age, boys often perceive themselves as more academically competent and capable than girls, even in the absence of any real difference in ability (Phillips & Zimmerman, 1990). Women tend to be less confident than men and, often, less confident than their abilities would merit, especially in STEM fields (Hackett, 1985). This lack of confidence leads to fewer women than men pursuing opportunities and careers in STEM fields (Betz & Hackett, 1981; Ehrlinger & Dunning, 2003)

### **B. Adaptive and Maladaptive Features**

There is one important benefit of a certain type of overconfidence that has been demonstrated time and time again. To the degree that people possess high feelings of self-efficacy – a sense that one will be able to take on and complete the actions necessary to attain one's goals – they are more willing to take on challenges and, ultimately, they achieve more than those with lower feelings of self-efficacy (see Bandura, 1997, for a review). The benefits of self-efficacy can be self-fulfilling in that someone who is overconfident will be more willing to apply for high-level jobs, attempt very challenging classes, and take risks. Although these people might not achieve everything that they hope or expect, just by virtue of trying, they will achieve considerably more than those who do not try at all. As such, self-efficacy correlates positively with a host of successful athletic (Kane, Marks, Zaccaro, & Blair, 1996), educational (Schunck,

1996), occupational (Latham & Saari, 1979; Porras & Anderson, 1981), and health outcomes (Carey & Carey, 1983).

The literature on self-efficacy suggests that a certain type of confidence and, even, overconfidence might be beneficial. Bandura (1997) refers to these confident, successful people as “resolute strivers.” They are people who are not crushed by minor rejections in part because they believe that, with considered effort, they might succeed. This type is very different from other types of overconfident people, including those who believe that they already possess considerable skills and talent or who believe that their past accomplishments have been more impressive than objective metrics would warrant.

The maladaptive features of overconfidence are also plentiful. As noted in the opening example, thousands have been injured or died in overconfident attempts to scale Everest and other Nepali mountains (Salisbury & Hawley, 2011). Overconfidence can also result in less strong performance compared to a more accurate view of the self (Stone, 1994; Vancouver, Thompson, Tischner, & Putka, 2002). For example, one study asked undergraduates to assume the role of a high school principal tasked with improving students’ standardized test scores. Those participants who displayed more overconfidence in their solutions provided persuasive statements regarding the likelihood of plan success but were less likely than their less overconfident peers to see the potential deficiencies in their plan (Shipman & Mumford, 2011). Overconfidence can also lead to disappointment that might come when one recognizes that an actual outcome is considerably less positive than the expected outcome (McGraw, Mellers, & Ritov, 2004).

Equally important are the interpersonal consequences of overconfidence. It is true that an overconfident lawyer might experience incrementally more success in winning her cases

compared to a less confident lawyer. However, there is very little relationship between lawyers' predictions of case outcomes and what actually occurs (Goodman-Delahunty, Granhag, Hartwig, & Loftus, 2010). The clients of these lawyers might prefer a lawyer who is well-calibrated about the odds of success over one that is overconfident. Similarly, if asked to choose between a well-calibrated and an overconfident surgeon, we know whom we would prefer to hold the knife.

Overconfidence can also be maladaptive at the group level, often with disastrous consequences. "Groupthink" results when groups dismiss or fail to voice dissenting opinions instead encouraging concordance or harmony within the individuals composing the group. What often results in these cases is an insulation of the group from "outsiders" – as well as from individuals within the group itself – who have points of view or even relevant data that do not conform to the group consensus. Irving Janis (1972) was the first to coin the term and to model and explain the behavior in practical terms. The canonical example he used to illustrate both the process and the effects of groupthink was the Bay of Pigs invasion, when President Kennedy initiated a botched invasion of Cuba in 1961. Janis, and others more recently (e.g., Hermann & Rammal, 2010), identified a few hallmarks of groupthink in this context; the most important of these are a feeling of invincibility and a certainty in the morality of the group. Kennedy was new in office and his advisors were too anxious to disagree with him (or he with them), they underestimated Castro, and marginalized those in the administration who advised caution. Others have re-analyzed many of Janis's examples and suggested that a need for cohesion is not primary in groupthink. Rather, groups may be quicker than individuals acting alone to make decisions that lead to "closure" (Kruglanski, Pierro, Mannetti, & De Grada, 2006), or that threats to the shared social identity of the group better account for the phenomenon, when it occurs (Baron,

2005). The common outcome, though, is a flawed and dangerous decision-making process that can blind individuals to important risks.

In sum, overconfidence can be seen as a double-edged sword, allowing us to set our sights high (see Bandura, 1997, for a review) and to protect our fragile egos (Brown, 2012) while simultaneously robbing us from the opportunity to learn (Ehrlinger & Dweck, 2014). Perhaps the ideal state, then, might be a state of slight overconfidence – enough to reap the benefits without risking significant costs.

#### **D. Directions for Future Research**

Perhaps the most important avenue for future research on overconfidence is to better understand when and how overconfidence can be adaptive rather than maladaptive. As suggested above, we could imagine that it might be beneficial to be a little overconfident, but not vastly overconfident. Although others have argued this point (Baumeister, 1989), we know of no research that has tested this assertion or clearly outlined the ideal relationship between one's confidence and one's abilities. As the review above suggests, there are clear costs and benefits to overconfidence, but researchers have not yet identified how people can best maximize those benefits while minimizing potential costs.

To the degree that research has, and will continue to, identify maladaptive features of overconfidence, an important goal for future research will be to identify means of reducing overconfidence. Previous research has given some insight into strategies that might be effective for encouraging accuracy in self-assessments. However, this work is still in its infancy. For example, there are several mechanisms for reducing people's motivation to self-enhance. To the degree that overconfidence reflects a simple desire to think well of the self, then, one might inspire greater accuracy in self-assessments by making people accountable for their self-

assessments (Sedikides, Herbst, Hardin, & Dardis, 2002) or by allowing people to affirm positive aspects of their identity before they give confidence assessments (Blanton, Pelham, DeHart, & Carvallo, 2001). That said, it is clear that overconfidence stems from more than just simple enhancement. Indeed, participants in one study were offered \$100 as an incentive to provide accurate estimates of how well they had performed on a set of logic problems. Even this large financial incentive had no impact on the accuracy of students' assessments (Ehrlinger et al., 2008).

### **E. Clinical Implications**

In this section we will offer a brief overview of four areas where research on overconfidence has influenced (and been influenced by) real-world applications and outcomes.

#### *Clinical Psychology*

Based on the research and prevailing models discussed earlier, it should come as no surprise that individuals' self-perceptions deviate from the perceptions held by others, but research has shown that certain characteristics, especially narcissism, have the potential to eclipse these more general effects. Individuals scoring high on four measures of narcissism showed significantly greater overconfidence than their less narcissistic peers when predicting their performance in a group-decision task (John & Robins, 1994). Others have also found that overconfidence correlates with non-clinical narcissism; individuals higher in narcissism show no greater accuracy than those low in narcissism when predicting future performance, but they exhibit more confidence in those predictions (Campbell, Goodie, & Foster, 2004). Those high in narcissism tended to base their predictions of future outcomes on inflated expectations, instead of past performance on the task in question. A pattern of overconfidence can be seen in other clinical populations. For example, individuals with schizophrenia were more overconfident than

controls in their incorrect assessments of another's emotional state (Köther et al., 2012) and patients with borderline personality disorder showed increased overconfidence relative to non-patients on a Theory of Mind test (Schilling et al., 2012).

Clinicians themselves are not immune to professional errors of overconfidence. In a classic study, Oskamp (1965) offered clinicians case studies and asked for diagnoses. As participants were given more and more information about each case, their confidence in their diagnoses grew significantly. However, additional information had little impact on the accuracy of the clinicians' diagnoses, such that most of the clinicians studied were unduly overconfident in the accuracy of their impressions. It is important to note, though, that clinical confidence levels are sometimes effective predictors of patient risk (McNiel, Sandberg, & Binder, 1998) and that tendencies toward overconfidence can be combated. Sripada et al. (2011) have shown that when psychiatry residents who are engaged in psychotherapy review their ratings of patient functioning with the patients themselves, the therapists' overconfidence in treatment effects can be significantly mitigated.

### *Health*

A body of research demonstrates overconfidence among doctors, nurses, and other health professionals (e.g., Marteau, Johnston, Wynne, & Evans, 1989; Tracey, Arroll, Richmond, & Barham, 1997), but we will focus here on the related issue of lay-persons' overconfidence as it relates to their personal health decisions. Regarding general health, as well as a host of specific health issues, people underestimate their overall risk relative to the population (Weinstein, 1980, 1987) and show over-optimistic views of their health given facts about their specific risk factors (e.g., Sutton & Bolling, 2003). The obvious implication for these beliefs is that many individuals will continue to engage in risky or unhealthy behaviors, as individuals' perceptions of their own

vulnerability is a pre-requisite for engaging in preventative measures or the cessation of unhealthy ones (e.g., Becker, 1974; Weinstein, 1987). Although some techniques have been found to mitigate this excessive optimism (such as personal counseling and buttressing an individual's self-worth), arguably the most effective counter-balance is personal experience. Individuals who have experienced a negative health incident or life event (e.g., heart attack or auto accident) are more realistic in their personal assessments of the likelihood of experiencing relatively common and relatively uncommon events (Weinstein, 1987), though the effect is comparatively short-lasting and individuals tend to quickly regress to an overly optimistic state. This inflated self-view, though, can also be valuable in certain circumstances. When facing extremely trying life events, such as serious health problems or even war, one's ability to cope with the struggles and the aftermath are related to over-confidence and high optimism (Bonanno, Field, Kovacevic, & Kaltman, 2002; Taylor & Brown, 1988).

### *Management*

Project management leads to profound consequences of overconfidence. New projects suffer from the planning fallacy, in which managers systematically underestimate the time and cost of completion (Buehler et al., 1994). Entering new markets and starting a new business can be similarly problematic. Would-be entrepreneurs tend to overestimate their likelihood of success in lines of business that require relatively greater skill (Camerer & Lovallo, 1999). Some adaptive features of overconfidence can be seen in these examples as well. Entrepreneurs who showed greater self-confidence tended to work harder on their new businesses and tended to rely more on self-financing than less-confident business owners (Landier & Thesmar, 2003). This confidence allowed them greater flexibility and control over the business, but also led to greater risk and loss of capital in more cases than their less-confident peers.

The top of the corporate ladder is not immune to the costly consequences of overconfidence. Consider that high-level managers are in a particularly precarious position with regard to the “risk factors” associated with overconfidence: for example, they have relatively few opportunities for honest feedback from superiors (Morrison & Milliken, 2000) and they tend to receive a disproportionate amount of credit for successes (Meindl, Ehrlich, & Dukerich, 1985). The inflated beliefs about their managerial ability lead many CEOs to make errors of judgment that are dangerous for their organizations and extremely expensive.

### *Education*

Education relies on a student’s ability to assess her competence on a topic and then decide whether further study is warranted. Education thus stands to suffer to the degree students are unable to evaluate their learning accurately. Indeed, much research paints a bleak picture on this topic. Students consistently give themselves higher grades than they receive from their instructors (Falchikov & Baod, 1989). More recently, though, laboratory and applied studies have demonstrated the ways in which students can mitigate some of the negative consequences of overconfidence in education. Specifically, work on metacognition in young learners is promising, showing that activities which encourage reflection on what one knows (and does not yet know) – through activities such as self-quizzing and writing targeted summaries in the student’s own words – can lead to more accurate self-assessment of knowledge (Roediger & Karpicke, 2006; Thiede, Anderson, & Therriault, 2003). Data on student outcomes have confirmed the importance of strategies such as delayed self-testing and spaced study for fostering more accurate self-assessment and, consequently, success in learning (e.g., Thiede & Dunlosky, 1994).

### **F. Summary and Conclusions**

Collectively, the literature on overconfidence suggests that it is an ever-present feature of human judgment, leaking into our perceptions of our own abilities, our beliefs about our chances for success, our comparisons to other people, and our confidence in our beliefs. Overconfidence stems from both motivated desires to think well of the self and cognitive features of how people organize information. Because overconfidence stems from multiple causes, it is somewhat resistant to efforts to eradicate it from our judgments. Overconfidence is not all bad. In fact, it carries benefits in terms of encouraging effort and persistence. Overconfidence in the form of self-efficacy can lead to real-world success. However, other forms of confidence likely carry more costs than benefits including increased risk and loss of opportunities to improve. Future research should improve our understanding of when and how much overconfidence can foster success.

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