



# Understanding overconfidence: Theories of intelligence, preferential attention, and distorted self-assessment<sup>☆</sup>



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## HIGHLIGHTS

- Those who view intelligence as fixed account for most of the “overconfidence effect.”
- Overconfidence is preserved, in part, by attending to easy more than difficult tasks.
- Growth mindsets lead to openness to difficulty and, in turn, greater self-insight.
- Teaching a growth mindset makes students open to difficulty and less overconfident.
- Overconfidence is maintained through preferential attention to ease over difficulty.

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## ABSTRACT

Knowing what we don't yet know is critical for learning. Nonetheless, people typically overestimate their prowess—but is this true of everyone? Three studies examined who shows overconfidence and why. Study 1 demonstrated that participants with an entity (fixed) theory of intelligence, those known to avoid negative information, showed significantly more overconfidence than those with more incremental (malleable) theories. In Study 2, participants who were taught an entity theory of intelligence allocated less attention to difficult problems than those taught an incremental theory. Participants in this entity condition also displayed more overconfidence than those in the incremental condition, and this difference in overconfidence was mediated by the observed bias in attention to difficult problems. Finally, in Study 3, directing participants' attention to difficult aspects of the task reduced the overconfidence of those with more entity views of intelligence. Implications for reducing biased self-assessments that can interfere with learning were discussed.

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## 1. Introduction

Learning any new task requires understanding the gap between what one currently knows and what one hopes or needs to know. While such self-insight is valuable, a wealth of research suggests that it is often elusive. Self-assessments often correlate poorly with objective measures of skill in a variety of domains, such as intellectual abilities (e.g., Borkenau & Lieber, 1992), social skills (e.g., DePaulo et al., 1997),

and job performance (e.g., Bass & Yammarino, 1991; for a review, see Dunning, 2005). Most examples of error-prone self-assessment reveal overconfidence. Indeed, a perusal of the confidence literature can lead one to fear crossing the street as users of nearly every mode of transportation display overconfidence. Drivers (Marttoli & Richardson, 1998), motorcyclists (Rutter et al., 1998), and even bungee jumpers (Middleton et al., 1996) tend to overestimate their ability to travel safely in their preferred manner.

Overconfidence carries important consequences. For example, overconfidence often leads students to make poor study choices and, consequently, impedes learning (Dunlosky & Rawson, 2012). Furthermore, one person's overconfidence can carry significant consequences for others. People base important health and financial decisions on advice offered by doctors and lawyers. This practice seems suspect in light of evidence that both doctors (Tracey et al., 1997) and lawyers (Loftus &

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Wagenaar, 1988) tend to be overconfident with respect to their job-related knowledge and skills. It therefore seems crucial that researchers understand the roots of overconfidence in order to devise strategies for improving self-insight.

In the present paper, we seek to better understand a specific type of overconfidence—overplacement. Overplacement refers to overly positive perceptions of how one compares to others (Moore & Healy, 2008). Past research suggests that overplacement stems, in part, from the desire to view the self positively (Blanton et al., 2001). However, there is often an indirect path from this self-enhancement goal to overconfidence in self-assessments. It would be hard to truly believe that one is brilliant based only on the fact that this belief feels nice to maintain. Instead, motivated processes are likely to be most effective when they are hidden from view (Gilovich, 1991). Thus, self-enhancement motives often influence self-judgments indirectly by shaping the way that we attend to, interpret, and remember information (Kunda, 1990).

Little is known about who is most overconfident and why. In this paper, we draw from the literature on theories of intelligence to identify the very individuals who might be most likely to self-enhance and, as a result, to show the most overconfidence. Past research suggests that the tendencies to avoid difficulty and react poorly to challenge are more characteristic of people holding one theory of intelligence over another (e.g., Hong et al., 1999, Nussbaum & Dweck, 2008). We examine whether overconfidence is most prevalent among those whose theory of intelligence leads them to forego learning opportunities in order to maintain positive beliefs regarding their competence. Moreover, we build on this literature to propose a novel contributor to overconfidence—a biased tendency to allocate attention away from difficulty. Indeed, we will propose that people holding one intelligence theory may account for much, if not most, of the overconfidence effect.

Some people hold a more *incremental* view of intelligence—characterized by the belief that intelligence is malleable and can be developed over time—while others hold a more *entity* view—characterized by the belief that intelligence is fixed and unchangeable (for reviews, see Dweck, 1999, 2006). We predict that people's beliefs about intelligence will impact the degree to which they engage in self-enhancing behavior, as opposed to behavior that indicates greater openness to negative information (cf. Leonardelli & Laken, 2010 for a related idea). We know from past research that incremental theorists' belief that they can improve their intelligence leads them to adopt learning goals in which they strive to improve their abilities (Dweck & Leggett, 1988). This orientation toward learning, we argue, should make incremental theorists open to both positive and negative feedback, which should result in relatively accurate views of the self. In contrast, entity theorists' belief that intelligence is fixed leads them to adopt goals characterized by efforts to validate, rather than improve, their intelligence (Nussbaum & Dweck, 2008). We argue that this orientation will leave entity theorists with greater motivation to maintain positive views of their intelligence compared to incremental theorists. As such, entity theorists may engage in acts that leave them feeling (over)confident more often than their incremental theory peers. Building on this work, we suggest that entity theorists will seek to maintain overly positive self-views by means of preferential attention to the experiences of implicit positive feedback and ease compared to experiences of effort and difficulty.

Prior research offers preliminary evidence that the perception of a trait as fixed might inspire avoidance of negative feedback. For example, Dunning (1995) demonstrated that participants who had performed poorly on a test of a purportedly fixed trait showed less interest in additional feedback compared to participants who had performed well. An entity theory of intelligence also promotes lessened attention to explicit corrective feedback or errors, compared to an incremental theory (e.g., Mangels et al., 2006).

The current investigation builds on this work to illuminate a previously unknown mechanism that might contribute to differences in

overconfidence. We examine whether motivations to avoid negative feedback might lead entity theorists to allocate less attention to difficult problems and more attention to easy problems on intellectual tasks, compared to incremental theorists. No research has previously explored how attention allocation might influence overconfidence. We examine whether this biased pattern of attention allocation leaves entity theorists with more overconfident self-assessments than their incremental theorist peers. We focus on people's attention to the immediate self-generated feedback from feelings of ease or difficulty, understanding or confusion, rather than explicit feedback regarding success or failure. Facing difficulty while completing a task can serve as a cue that one is performing poorly, constituting implicit failure feedback. Similarly, experiences of ease when performing a task serve as implicit cues that one is succeeding or performing quite well. Indeed, superficial manipulations designed to inspire feelings of difficulty leave entity theorists, but not incremental theorists, feeling less confident about their performance (Miele & Molden, 2010). As such, we suggest that entity theorists are likely to avoid difficult aspects of tasks that might require them to face up to the possibility that they are not performing well and, by extension, might not be smart. In short, relative to incremental theorists, we expect that entity theorists will allocate their attention in motivated ways—toward easy task aspects and away from difficult task aspects—and that, as a result, they will hold overconfident beliefs regarding how well they have performed on an intellectual task.

## 2. The present investigation

The present research explores who shows overconfidence and why. Study 1 examines whether those with more of an entity theory show greater overplacement (overestimation of their percentile score) than those with stronger incremental theories. Study 2 experimentally manipulates intelligence theories and examines whether a biased pattern of attention allocation mediates a tendency for greater overplacement in the entity compared to the incremental condition. Finally, Study 3 features a manipulation of participants' attention allocation to examine whether directing attention to difficult items eliminates the overplacement effect among entity theorists.

### 3. Study 1: intelligence theories and overconfidence

Study 1 addressed the relationship between theories of intelligence and overconfidence. We predicted that participants with stronger entity views would account for much of the commonly found pattern of overplacement.

#### 3.1. Methods

##### 3.1.1. Participants

Fifty-three<sup>1</sup> university students participated in exchange for extra credit in their psychology courses (62% female).

##### 3.1.2. Procedure

Several days before the main experiment, participants completed a web-based 8-item measure of their theories of intelligence (Dweck, 1999). They rated their agreement with statements such as “You have a certain amount of intelligence, and you can't really do much to change it” and “You can always substantially change how intelligent you are” on a 6-point scale from “strongly disagree” to “strongly agree.”

<sup>1</sup> No participants were excluded from analyses across the three studies. We used a rule of thumb of 25 participants per cell to determine the sample size for Studies 1 and 3. Each sample is slightly larger than planned because of imperfect enforcement of the stopping rule. For Study 2, we doubled our rule of thumb for a goal of 50 participants per cell to ensure sufficient power for the mediational analyses. Study 2 has slightly fewer than 50 participants per cell because our access to participants had ended for the semester.

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