

Strategically Overconfident (to a Fault): How Self-Promotion Motivates Advisor Confidence

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## Abstract

Unlike judgments made in private, advice contexts invoke strategic social considerations that might exacerbate overconfidence in advice. Many scholars have assumed that overconfident advice emerges as an adaptive response to advice recipients' preference for confident advice and failure to adequately penalize overconfidence. An alternative possibility, however, is that advisors robustly display overconfidence as a means of self-promoting their expertise independently of feedback about advice recipients' preferences. Across four experiments and a survey of advice professionals, the current research finds support for this possibility. First, it demonstrates that—even when presented with feedback that an advice recipient is penalizing their overconfidence—advisors express more overconfidence than private decision-makers. Second, it more precisely identifies the underlying motivations of advisors' overconfidence. Rather than reflecting a pattern of self-deception or a genuine desire to be helpful, advisors' overconfidence was motivated by *strategic* self-promotion. Relative to the overconfidence reflected by their private beliefs, advisors deliberately inflated their overconfidence while broadcasting judgments to advice recipients when (a) it was salient that advice recipients were evaluating their competence and (b) appearing competent served their self-interest.

*Keywords:* overconfidence, confidence, advice giving, self-promotion, accountability

### Strategically Overconfident (to a Fault): How Self-Promotion Motivates Advisor Confidence

Overconfident advice has been blamed for exacerbating a number of problems in applied settings. Financial advisors' overconfidence encourages excessive trading and risk exposure (Hackenthal, Haliassos, & Jappelli, 2012). Lawyers' overoptimistic forecasts in trial outcomes influence clients to pursue costly litigation (Goodman-Delahunty, Granhag, Hartwig, & Loftus, 2010; Wistrich & Rachlinski, 2012). Even state leaders' decisions to engage in costly wars has been partly attributed to the influence of overconfident intelligence officials and military strategists (Johnson et al., 2006).

Clearly, it is in the best interest of managers and organizational decision-makers to understand how they can curb the overconfidence of expert advisors. Organizations frequently elicit expert forecasts to inform financial decisions (Plous, 1995), hire consultants to inform strategic choices (Gino & Schweitzer, 2008), and solicit the relevant domain expertise of employees to enhance team performance (Zhang & Peterson, 2011).

Although overconfidence is often characterized as a robust cognitive bias shaped by the manner in which it is measured and elicited (Haran, Moore, & Morewedge, 2010; Juslin, Winman, & Hansson, 2007; Klayman, Soll, González-Vallejo, & Barlas, 1999), advice-giving is an inherently social act. Advisors face strategic social considerations not faced by private decision-makers who are not broadcasting their judgments to an audience, such as the preferences of advice recipients (Kray, 2000; Kray and Gonzalez, 1999), how they present their advice to others (Jonas and Frey 2003; Jonas et al. 2005), and how these factors might impact their chances of wielding influence in advice markets (Radzevick & Moore, 2011). However, because research on advice confidence has tended to focus on the advice recipient's perspective (e.g., Price and Stone 2004; Sah, Moore, & MacCoun, 2013; Sniezek and Buckley 1995; Sniezek

and Van Swol 2001; Vullioud, Clément, Scott-Phillips, & Mercier, 2017; Yaniv & Foster, 1995), it is unclear how the strategic social dynamics of advice contexts shape advisors' confidence relative to private decision-makers making judgments in the absence of an audience. In the current research, I explore why the dyadic interaction between advisors and advice recipients might elicit *strategic* overconfidence where advisors deliberately inflate their confidence to the point that their overconfidence exceeds the overconfidence typically observed in private decision-makers.

Many have argued that one reason for the prevalence of overconfident advice is that advice recipients fail to hold advisors accountable for their overconfidence (e.g., Radzevick & Moore, 2011; Tetlock, 2005). Because people reward confident advisors (Price & Stone, 2004) and do not adequately punish overconfidence (Radzevick & Moore, 2011; Ronay, Ostrom, Lehmann-Willenbrock, Mayoral, & Rusch, in press), advisors should learn advice seekers' preferences and adapt by exploiting the benefits of overconfidence. But would advisors' inflated confidence persist in light of evidence that others are punishing overconfidence? If overconfident advice is a byproduct of learning and adapting to advice recipients' preferences, then advisors should also notice when an advice recipient is penalizing their overconfidence and adapt by tempering their confidence. This logic underlies the common assumption that organizational accountability mechanisms that make it easier for advice seekers to identify and penalize overconfidence can be a powerful remedy for curbing its pervasiveness (Jermias, 2006; Meikle, Tenney, & Moore, 2016; Sah et al., 2013; Tetlock, 2005; Tetlock & Kim, 1987).

Another possibility, however, could be that advisors are so accustomed to inflating their confidence in order to reap its rewards that they fail to adapt their approach in situations where overconfidence is penalized. This would suggest that accountability might not necessarily be a

cure-all for overconfident advice. Scholars might instead be better off considering how the social nature of advice-giving and reward systems inherent in many advice contexts elicit overconfidence.

The current research addresses the question of whether advisors' overconfidence reflects an adaptive response to signals about advice recipients' preferences that is curbed when overconfidence is punished versus a robustly applied self-promotion tactic that occurs independently of feedback about advice recipients' preferences. In the process, it makes several important theoretical, empirical, and practical contributions to the overconfidence and advice-giving literatures. First, it more broadly explores how features of the dyadic interaction between advice givers and recipients might shape advisors' overconfidence. Because prior overconfidence research has focused on either private judgments or publicly broadcasted advice without drawing comparisons between the two (Meikle et al., 2016; Moore, Tenney, & Haran, 2015), it is unclear how the strategic social dynamics and reward systems of advice-giving contexts influence advisors' overconfidence in relation to private decision-makers who are not subjected to these dynamics. The current research theoretically and empirically differentiates between different accounts for the prevalence of overconfident advice.

Second, the current research offers practical takeaways for managers and other organizational decision-makers hoping to reduce their exposure to overconfident advice. By testing advisors' responses to feedback about advice recipients' preferences, this paper's findings have implications for whether accountability mechanisms are sufficient to reduce advisor overconfidence or whether alternative approaches that address advisors' reward systems and concerns about social evaluation are more likely to be effective. Finally, and more generally, the

current research demonstrates that audience considerations play a role in shaping overconfidence and the communication of uncertainty.

### **Two Potential Explanations for Overconfident Advice**

Perhaps the most popular argument for the prevalence of overconfident advice is that it is an adaptive behavior acquired by learning advice seekers' preferences. Because people prefer confident advisors (Price & Stone, 2004) and fail to adequately penalize overconfidence (Kennedy, Anderson, & Moore, 2013), advisors should learn that overconfidence is rewarded from their interactions with advice seekers and exploit its benefits (Radzevick & Moore, 2011; Ronay et al., in press). As articulated by Radzevick and Moore (2011) on advice-takers' susceptibility to overconfident advice: "...we see these wounds as largely self-inflicted. By rewarding advisors for expressing confidence while not adequately penalizing them for being wrong, customers in the market are essentially 'getting what they paid for'" (p. 99).

Yet if this *adaptive overconfidence hypothesis* is true, then one would also expect that advisors should be cautious when interacting with an advice recipient who is holding them accountable for their overconfidence. One reason overconfidence frequently goes unpunished is because people do not arm themselves with feedback about advisors' accuracy (Sah et al., 2013). But when presented with unambiguous feedback about advisors' accuracy, advice seekers reward accurate (rather than confident) advisors and punish overconfident ones (Sah et al., 2013; Tenney, MacCoun, Spellman, & Hastie, 2007; Tenney, Spellman, & MacCoun, 2008; Tenney, Meikle, Hunsaker, Moore, & Anderson, 2019; Vullioud et al., 2017). If the risks of displaying confidence outweigh its potential rewards, then communicators' optimal strategy should be to temper their confidence (cf. Johnson & Fowler, 2011). This suggests that a simple, but powerful prescription for eliciting well-calibrated advice is to hold advisors accountable for their

overconfidence. In light of signals that overconfidence is getting them into more trouble than it is worth, rational advisors acting in their own self-interest should learn a recipient's preference for tempered confidence and adapt to the point that they display *less* overconfidence than private decision-makers. However, it is unclear whether this prescription necessarily holds true because the only studies to examine communicators' confidence over the course of repeated interactions have only considered contexts where the penalties for being exposed as overconfident do not outweigh the benefits of calibrated confidence (Hertz et al., 2017; Radzevick & Moore, 2011).

**Adaptive Overconfidence Hypothesis:** When presented with feedback that an advice recipient is penalizing overconfidence, advisors should exhibit *less* overconfidence than private decision-makers.

An alternative possibility is that advisors so robustly rely on using overconfidence to serve their interests that they fail to learn from signals that an advice recipient is penalizing overconfidence and adapt their approach. This *strategic self-promotion hypothesis* argues that, independently of any feedback they receive about an advice recipient's preferences, the prevalence of overconfident advice can be accounted for by advisors robustly employing a tactic of displaying confidence in situations where they are motivated to project competence to an audience. Actors engage in strategic self-promotion when they deliberately attempt to project competence to an audience (Godfrey, Jones, & Lord, 1986; Jones & Pittman, 1982). Because confident people get ahead so frequently and are so seldom punished for their overconfidence (Anderson, Brion, Moore, & Kennedy, 2012; Kennedy et al., 2013; Tenney et al., 2019), advisors may learn to deliberately inflate their confidence across a range of situations that motivate them to self-promote and fail to adapt their approach in situations where overconfidence undermines their credibility.

Although economic theory often assumes that communicators employ tactics that maximize their chances of eliciting desired behaviors from others (DellaVigna 2009; Köszegi, 2014), communicators sometimes use suboptimal tactics (Daniels & Zlatev, 2019). At times, these tactics can be such deeply ingrained strategies that communicators fail to adjust when faced with evidence that they should adopt a different approach (Zlatev, Daniels, Kim, & Neale, 2017). Human behavior is inherently variable and creates a noisy environment that constrains individuals' ability to learn about the causal relationships between their actions and others' subsequent behavior (Ball, Bazerman, & Carroll, 1991; Brehmer, 1980; Tversky & Kahneman, 1986). This raises the possibility that advisors fail to learn from signals that others are penalizing overconfidence and are so conditioned to display it as a means of strategic self-promotion that they continue to do so even when presented with evidence that overconfidence is undermining their self-interest. Advisors are subject to social and economic considerations that might motivate them to project competence (Jonas et al., 2005; Radzevick & Moore, 2011), so they could display *more* overconfidence than personal decision makers—even when others are attempting to hold them accountable by penalizing their overconfidence.

**Strategic Self-Promotion Hypothesis:** Independently of feedback about how an advice recipient responds to overconfidence, advisors should exhibit *more* overconfidence than private decision-makers.

### Overview of Studies

Advisors' overconfidence can rarely be measured objectively with field data (Radzevick & Moore, 2011)—let alone adequately compared to the unobserved beliefs of private decision-makers with identical information and expertise. Therefore, I adopt a similar approach to Radzevick and Moore (2011) by using experimental settings to study advisors' exchange with



advice recipients. To simulate the expertise asymmetries inherent in most advice contexts, these experiments consider dyadic interactions where focal participants advantaged by relative expertise (advisors) are tasked with communicating judgments to a target (advice recipient) lacking their privileged information (e.g., Radzevick & Moore, 2011; Sah et al., 2013). I then compare the overconfidence of advisors to that of private-decision makers not broadcasting their judgments to a target.

Study 1 tests for whether advisors' overconfidence diverges from private decision-makers' overconfidence in a repeated decision-making context where advisors receive noisy feedback that overconfidence represents a suboptimal approach to self-promotion. This allows for a direct test of whether advisors' overconfidence reflects a process of learning from feedback about advice recipients' preferences and adapting in response (adaptive overconfidence hypothesis) versus a robustly applied self-promotion tactic (self-promotion hypothesis). Studies 2-5 focus on more precisely identifying why advisors' overconfidence diverges from that of private-decision makers and how it manifests. Study 2 more directly tests for the extent to which self-promotion motivates advisor overconfidence by considering whether advisors' overconfidence primarily diverges from private decision-makers' overconfidence when it is highly salient that advice-seekers are assessing their competence. In the process, it attempts to establish that advisors' overconfidence is deliberate and not a byproduct of self-deception (e.g., Chance, Norton, Gino, & Ariely, 2011). Studies 3 and 4 test whether advisors' overconfidence can be explained by self-interested strategic behavior as opposed to a genuine desire to be helpful to advice recipients by providing informative judgments (cf. Yaniv & Foster, 1995, 1997). Finally, Study 5 tests for evidence of strategic self-promotion in the self-reported overconfidence of advice professionals.

I examine participants' overconfidence in the form of overprecision, or excessive certainty in the accuracy of one's judgment (Moore & Healy, 2008). Although overconfidence can take other forms<sup>1</sup>, overprecision is the form of overconfidence most directly tied to advisors' function of enhancing advice-seekers' judgmental accuracy (Harvey & Fischer, 1997). As such, the literature on advice confidence has predominately studied how advice seekers' judgment is influenced by signals of advisors' accuracy like the probability that the advisor's recommendation is accurate or the margin of error surrounding the advisor's judgment (Bonaccio & Dalal, 2006). Further, because overprecision is notoriously robust in comparison to other forms of overconfidence (Moore et al., 2015), the current research offers an explanation for the communication and spread of a particularly pervasive form of overconfidence.

Data and materials for all studies are accessible at

[https://osf.io/gtypr/?view\\_only=f06e733ef13644e5b9a1de26c5157dc1](https://osf.io/gtypr/?view_only=f06e733ef13644e5b9a1de26c5157dc1). I also preregistered planned sample sizes, exclusion criteria, and analyses for Studies 1 and 5 (Study 1: [https://osf.io/wp6c7/?view\\_only=bac75b85b76b4a05866d1aadb3001645](https://osf.io/wp6c7/?view_only=bac75b85b76b4a05866d1aadb3001645), Study 5: <http://aspredicted.org/blind.php?x=ni5ab6>). For all studies, I report all data exclusions (if any), all manipulations, and all measures.

### **Study 1: Does Overconfident Advice Persist When it is Punished?**

Study 1 compares advisors' overconfidence to that of private decision-makers in a context where overconfidence is a liability to advisors. To accomplish this goal, I randomly assigned participants to the role of either advisor or private decision-maker. Participants then made a series of predictions and indicated their confidence in each prediction. Private decision-makers served as a control group who did not broadcast their judgments to an advice recipient. In

<sup>1</sup> Overconfidence can also occur in the form of overestimating one's absolute or relative performance (Moore and Healy 2008).

contrast, advisors broadcasted their confidence to a less-informed partner and were incentivized to have this partner elect to receive their advice; this type of incentive has been used in prior research to mimic the incentives inherent in many advice contexts where advisors are rewarded for convincing clients to “hire” them as an advisor (Radzevick & Moore, 2011). Importantly, advisors were punished for overconfidence: Their partner’s probability of electing to receive their advice in the next round dropped directly with advisors’ confidence following inaccurate predictions and was not impacted by advisors’ confidence after accurate predictions.

If the adaptive overconfidence hypothesis can account for advisors’ overconfidence, then their judgments should reflect *less* overconfidence than private decision-makers. Because the net benefits of confidence do not outweigh the penalties associated with overconfidence in this context, advisors should learn that displaying confidence is a suboptimal strategy. However, if advisors’ overconfidence can be accounted for by the strategic self-promotion hypothesis, then they should fail to learn from feedback about advice recipients’ preferences and display more overconfidence than private decision-makers—even though it is to their detriment in this context.

In addition to comparing advisors’ and private decision-makers’ overconfidence, I also explore whether they update differently to feedback about their accuracy. While feedback has the potential to allow decision-makers to better calibrate their confidence after inaccurate predictions (Moore et al., 2017; Murphy & Winkler, 1984), advisors could potentially respond differently than private decision-makers. On the one hand, irrespective of their overall overconfidence, advisors could show evidence of learning recipients’ tendency to punish overconfidence by tempering their confidence more than private decision-makers following inaccurate predictions. This observation would be consistent with the adaptive overconfidence hypothesis. On the other hand, if the strategic self-promotion hypothesis is true, then advisors should fail to curb their

overconfidence in response to accuracy feedback. It could even be possible that advisors use overconfidence as form of compensatory self-promotion (e.g., Baumeister & Jones, 1978; Frey, 1978) where they overcompensate for their inaccuracy by bolstering their confidence on future predictions as a means of signaling that “last time was a fluke, but this time is different.”

## Method

**Participants.** Based on a preregistered data collection rule, I recruited 216 Amazon Mechanical Turk (MTurk) workers to complete the study ( $M_{\text{Age}} = 34.39$  years,  $SD = 10.34$ , 36% female). In this and all subsequent studies, participants were not allowed to proceed to the main experiment until they successfully passed a comprehension check verifying their understanding of study procedures.

**Procedure.** Participants began the study by learning that they would make a series of predictions about the future value of stocks on the basis of information about each stock’s price at the beginning of each month over a twelve-month period (selected at random from the S&P 500 and labeled stocks “A-J” to obscure their identity). For each stock, participants made a prediction about whether the stock’s value would be greater than or equal to a reference price at the start of the subsequent month (“Month 13”). After learning about the general task, participants were then paired with another MTurk worker in a chatroom and prompted to exchange strategies for making accurate predictions during the study; the purpose of this instruction was to provide advisors with a salient partner in a follow-up interaction and reduce any potential suspicion about the validity of their partner’s choices, which were simulated based on an algorithm derived from a separate sample of advice recipients.

After exchanging strategies with a partner, participants were then randomly assigned to advisor or private decision-maker roles. Regardless of their role, participants learned about

several key features of the study. First, in contrast to the twelve-month period of price data that they would use to make predictions about each stock, some other participants in the study would only be provided with access to the first three months of data for this time period; the purpose of this instruction was to provide advisors and private decision-makers alike with the sense that they were in a position of relative expertise compared to some other participants. Second, participants learned that they would be prompted to indicate their level of confidence in their predictions by indicating the probability that a given prediction is accurate on a scale ranging from 50% to 100% (“There is a \_\_\_% chance that I accurately determined whether the stock’s value will be above or below \$XX.XX at the start of Month 13; XX.XX was filled with the stock’s reference price). Third, participants learned that they would receive information about the value of each stock after making predictions and indicating their confidence for a given stock, but before proceeding to make a prediction on the next stock. To reinforce their understanding of study procedures, participants were guided through a sample prediction as they read about the procedure.

*Advisors.* Participants assigned to the advisor role learned that their confidence for a given prediction would be broadcasted to their partner. To capture the dynamics of advice markets where advisors can publicly signal their confidence in their ability to provide sound advice, but do not necessarily broadcast specific information like formal predictions unless a client has enlisted their services, advisors were informed that their partner—who was incentivized to be accurate—would have the opportunity to access their predictions in exchange for a small fee after seeing their confidence (Radzevick & Moore, 2011). However, in the interest of providing advisors with an opportunity to build a reputation with their partner, they were also informed that their partner would receive feedback about the accuracy of each

prediction between rounds of predictions; this would occur irrespective of their partner's decision to access their prediction in the prior round. In line with the real-world incentives advisors typically earn for enlisting clients, advisors learned that they would earn one ticket for a \$50 bonus payment raffle each time their partner elected to access their prediction for a given stock.

In addition to receiving feedback about their accuracy, advisors also learned about whether their partner elected to “hire” them by accessing their predictions in a given round, but before proceeding to the next round. Although the instructions did not specify who advisors' partner would be, they were written to elicit the pretense that their “partner” was the same person they interacted with earlier in a chatroom. In reality, advisors' “partner” was an algorithm that initially rewarded confidence, but penalized overconfidence after advisors' initial prediction (i.e., the time at which advice recipients would have feedback about advisors' accuracy). In the interest of simulating partners' hiring decisions in an ecologically valid manner that retains a degree of within-partner decision variance representative of the actual choices of advice recipients (cf. Brunswik, 1955), the algorithm's parameters were derived from a model predicting the choices of a separate sample of advice recipients on the basis of their prior hiring decision, along with advisors' confidence, prior confidence, and prior prediction accuracy.<sup>2</sup> Importantly, for advisors' initial prediction, each percentage point increase in their confidence resulted in a 5% increase in their odds of being hired. However, in subsequent rounds (where advisors and advice recipients alike had information about advisors' accuracy in prior rounds), advisors' confidence had no bearing on their odds of being hired unless they were inaccurate:

<sup>2</sup> In a separate study conducted prior to Study 1, 101 advice recipients followed the procedure of advisors' partner as described to advisors. See the Supplemental Online Materials (SOM) for more detail about advice recipients' procedure (Study S1) and the process of developing an algorithm that could reasonably model their choices while ensuring that overconfidence was penalized on balance.

For each inaccurate prediction, advisors' odds of being hired *decreased* by 5% with every percentage point increase in their confidence level for the inaccurate prediction. On the balance, the algorithm rewarded tempered confidence more than high confidence.

In total, advisors completed ten rounds of making predictions, indicating their confidence, and receiving feedback about their accuracy and the hiring decision of their partner. This number of rounds was selected on the basis of prior research demonstrating that ten rounds provides sufficient feedback about others' behavior to elicit adjustments in communicators' influence tactics, yet is also approximately the point at which communicators fail to show evidence of further learning in response to additional feedback (Zlatev et al., 2017). Critically, I did not inform advisors about how many rounds of predictions they would complete or warn them prior to the final round of predictions.

***Private Decision Makers.*** Participants assigned to the private decision-maker role made predictions, indicated their confidence, and received feedback about their accuracy across the same ten rounds of predictions as advisors. However, they were informed that their predictions and confidence would be private and not shown to any other participants. As such, they were not paired with a partner and did not receive feedback about their partner's hiring decisions. Instead of being incentivized to be hired by a partner, private decision makers learned that they would be entered into a \$50 bonus payment raffle for simply completing the study.

***Measuring Overconfidence.*** In this and all subsequent studies, I assessed the magnitude of advisors' overconfidence by regressing each participant's confidence on his or her accuracy and retaining the standardized residuals. This approach results in a measure of overconfidence that represents participants' residual overconfidence above and beyond what could have been

predicted by their accuracy.<sup>3</sup> To verify that any effects on participants' overconfidence reflected patterns in their confidence (rather than an artifact of their accuracy), I replicated all analyses of participants' residual overconfidence on their raw (i.e., unresidualized) confidence; all effects reported in this manuscript hold (see SOM).

## Results

Following a preregistered data analysis plan, I analyzed participants' overconfidence across rounds using a multilevel linear regression model nesting rounds within participants using an advisor-specific random intercept.<sup>4</sup> The results exclude three participants (one in the private decision-maker condition and two in the advisor condition) who expressed suspicion about whether their partner in either the chatroom (both roles) or main study (advisors only) was an actual person; all effects reported below hold when including these participants. All models used in analyses are reported in Table 1.

Participants exhibited a robust pattern of overconfidence, as their mean confidence of 81% exceeded their prediction accuracy of 53%,  $t(215) = 24.85$ ,  $p < .001$ . This effect held for both advisors and private decision-makers (both  $ps < .001$ ).

Relative to private decision-makers, advisors were more overconfident across predictions (Model 1:  $z = 2.30$ ,  $p = .022$ ,  $d = 0.32$ ; Model 2:  $z = 2.33$ ,  $p < .02$ ,  $d = 0.33$ ). An exploratory analysis failed to find evidence of this effect being qualified by round (Model 4:  $z = 1.80$ ,  $p = .20$ ). Despite exposure to repeated feedback that the risks of overconfidence outweighed the

<sup>3</sup> Researchers have recommended this approach for measuring overconfidence because accuracy-based components like simple difference scores (i.e., subtracting accuracy from confidence) are primarily influenced by the component with higher variance (Edwards, 1994; Kennedy et al. 2013). Because overprecision is necessarily confounded with accuracy (Klayman et al. 1999; Olsson, 2014), accuracy can obscure any effects driven by confidence judgments if it is not partialled out.

<sup>4</sup> I made a decision after completing data collection to focus the paper on overconfidence, rather than confidence. As a result, I deviated from the preregistered plan to measure advisors' "confidence." All analyses of overconfidence reported in this manuscript replicate for participants' raw confidence that is unadjusted for accuracy (for analyses of participants' raw confidence in Study 1, see Table S2 of the SOM).



benefits of confidence, advisors displayed more overconfidence than private decision-makers in the tenth and final round of predictions ( $M_{\text{Advisor}} = 0.15$ ,  $SD = 0.09$  vs.  $M_{\text{Decision-Maker}} = -0.19$ ,  $SD = 0.10$ ),  $t(214) = 2.57$ ,  $p = .011$ ,  $d = 0.35$ . Taken together, this is consistent with the strategic self-promotion hypothesis and inconsistent with the adaptive overconfidence hypothesis.

Some evidence of an interaction between role and prior round accuracy also emerged (Model 3:  $z = 1.72$ ,  $p = .085$ , Model 4:  $z = 1.90$ ,  $p = .062$ ). A simple slopes analysis revealed that private decision-makers' overconfidence was reduced after receiving negative feedback about their accuracy in the prior round,  $B = -0.11$  ( $SE = 0.05$ ),  $z = 2.31$ ,  $p = .021$ ,  $d = 0.32$ . In contrast, advisors' overconfidence was insensitive to feedback about their accuracy,  $B = 0.01$  ( $SE = 0.05$ ),  $z = 0.12$ ,  $p = .90$ . This provides further evidence consistent with the strategic self-promotion hypothesis, as advisors failed to learn their partner's preferences for tempered confidence and displayed overconfidence as a means of self-promotion. Unlike private decision-makers, whose overconfidence reduced in response to feedback that about their accuracy, advisors' overconfidence persisted to a similar degree in the face of signals about their poor calibration.

## Discussion

The results of Study 1 support the strategic self-promotion account. Rather adapting their approach, advisors' overconfidence persisted in the face of evidence that their overconfidence was being penalized on the balance. However, it should be noted that advisors received noisy feedback about their partner's preferences. This suggests that it could still be possible for the adaptive overconfidence hypothesis to hold when advice recipients respond in a perfectly consistent manner. If advisors were *never* hired when they were exposed as being overconfident after making an inaccurate prediction and *always* hired after every prediction on which they were well-calibrated, advisors may have eventually learned to temper their confidence.

But the assumption that advice recipients would penalize overconfidence and reward calibration 100% of the time is unrealistic in most applied settings. Variability in human behavior is inevitable and constrains individuals' ability to learn how their decisions impact others' choices in virtually all real-world environments (Ball et al., 1991; Zlatev, Daniels, Kim, & Neale, 2018). Indeed, the current study was designed with ecological validity in mind, as advice recipients were simulated on the basis of the decisions of an actual sample of advice recipients. Mere accountability is therefore unlikely to adequately curb advisors' strategic overconfidence. Whether the result of a hardwired association or byproduct of being socialized to believe that overconfidence is always rewarded, advisors appeared to rely so strongly on overconfidence as a means of self-promotion that they failed to revise their strategy when doing so undermined their economic success.

### **Study 2: Is Advisors' Overconfidence Deliberate or Self-Deceptive?**

Study 1 provides evidence that the self-promotion hypothesis, rather than adaptive overconfidence hypothesis, can account for advisors' overconfidence in relation to private decision-makers. Study 2 begins a series of studies that attempt to more precisely identify how advisors' strategic self-promotion manifests and differentiate the strategic self-promotion hypothesis from other similar accounts for the prevalence of overconfidence that have been proposed in the literature.

Although providing advisors immediate feedback about their accuracy and advice recipients' hiring decisions was critical to testing for whether advisors' overconfidence reflects an adaptive learning process, most real-world environments do not allow for immediate feedback (Tversky & Kahneman, 1986). Because the strategic self-promotion hypothesis assumes that advisors' greater overconfidence in relation to private decision-makers holds independently of

any feedback they might receive about recipients' preferences, demonstrating that the hypothesis holds in the absence of feedback is crucial. If advisors' overconfidence reflects a robustly applied self-promotion tactic, then their elevated overconfidence should hold in the absence of an opportunity to learn the preferences of advice recipients.

First, Study 2 considers whether advisors' overconfidence is impacted by considerations about their audience. Although a necessary precondition of self-promotion is that others can observe one's behavior, situations can vary in the extent to which people recognize that they can shape others' impressions (Leary & Kowalski, 1990). People primarily engage in self-promotion when they are aware that their behavior has the potential to shape others' evaluation of their personal attributes (Hewitt et al., 2003; Nezlek & Leary, 2002). If advisors' overconfidence is driven by self-promotion, then their overconfidence should be greater in situations where they strongly perceive that others are evaluating their competence—or situations high in evaluative salience—than in situations low in evaluative salience.

Additionally, Study 2 tests whether advisors' overconfidence reflects *strategic* behavior that is deliberate, as opposed to self-deception. Whereas strategic self-presentation represents a deliberate attempt to appear competent to others (Godfrey et al., 1986; Jones & Pittman, 1982), self-deception represents genuinely delusional beliefs that persist when accurate judgments are a primary goal (Chance et al., 2011; Schwardmann & Van der Weele 2019). Von Hippel and Trivers (2011) argue that self-deception is an adaptive behavior that enhances individuals' success at self-presentation; if one's goal is to convince others about his or her competence, then those efforts should be more successful if the person genuinely believes that he or she is highly competent. Consistent with this assertion, the mere desire to be perceived as competent has the potential to elicit genuine overconfidence that manifests in individuals' private judgment

(Anderson et al., 2012; Schwardmann & Van der Weele, 2019). This raises the possibility that advisors' overconfidence might not be a byproduct of strategic self-promotion at all. Instead, it could reflect delusional beliefs activated by advisors' motive to appear competent when it is highly salient that others are evaluating their competence.

Thus, Study 2 elicited participants' judgments twice: First as advisors making public judgments and then as private decision-makers incentivized to make accurate judgments. This ordering was deliberate in order to maximize the chances of detecting an effect consistent with self-deception, as people are particularly prone to self-deception after their own claims about their competence are made public (Chance et al., 2011). I therefore reasoned that if self-deception can account for advisors' overconfidence, then their overconfidence as private decision-makers should increase in lockstep with their advice overconfidence as they become cognizant of others scrutinizing their competence.

If advisors' overconfidence is shaped by strategic self-promotion, however, then their public and private judgments should diverge. Although advisors should self-promote by deliberately inflating their confidence as they more strongly perceive that others are evaluating their competence, these considerations should have less of an impact on their private judgments. To the extent that advisors' overconfidence reflects strategic self-promotion, they should inflate their confidence above the confidence they display as private decision-makers when it becomes highly salient that others are evaluating their competence.

## **Method**

**Participants.** In total, 362 MTurk workers completed the experiment ( $M_{\text{Age}} = 34.02$  years,  $SD = 11.16$ , 40% female).

**Procedure.** Study 2 followed a 2 (role: advisor, private decision-maker) X 2 (evaluative salience: high, low) mixed design with evaluative salience manipulated between-subjects and role varying within subjects. The beginning of the study closely followed the procedure for advisors in Study 1, but with three exceptions. First, advisors did not receive feedback about their prediction accuracy or the advice recipient's decision of whether accept their advice. Instead, the advice recipient was described as a participant who would complete the study at a later point in time.<sup>5</sup> The purpose of this modification was to assess advisors' use of strategic overconfidence in the absence of feedback. However, this does not mean that participants did not have the opportunity to establish a reputation with their advice recipient: As with Study 1 advisors, participants were informed that advice recipients would receive feedback about each stock's actual price. As a second modification, participants evaluated only half of the stocks that were presented to Study 1 participants (randomized order). Because participants in this study played the role of both advisor and personal decision-maker, I selected five of the stocks from Study 1 to present participants in the interest of keeping the study length more manageable.

Third, I manipulated evaluative salience. To do this, I capitalized on prior research demonstrating that the language used to produce confidence judgments impacts the extent to which communicators' confidence elicits internal attributions about their competence versus external attributions about the decision context (Kahneman & Tversky, 1982; Løhre & Teigen, 2016; Ülkümen, Fox, & Malle, 2016). Relative to statements that refer externally to an event's likelihood ("there is a \_\_\_% chance of [event] occurring"), people associate self-referent confidence statements like the one used in Study 1 ("there is a \_\_\_% chance that I accurately determined") with communicators' degree of knowledge or skill. Reasoning that the framing of

<sup>5</sup> In order to determine advisors' payoffs, I later recruited a separate sample of participants to play the role of advice recipient.

advisors' confidence judgments would influence the degree to which they perceived that others were evaluating their competence, I created a manipulation of evaluative salience by varying the language used to elicit their confidence judgments; a pretest confirmed that the manipulation succeeded in shaping the extent to which participants perceived that others were evaluating their competence (see SOM, Study S2A for details about the pretest). Participants randomly assigned to the high evaluative salience condition were asked to send advice recipients a message indicating how confident they were in the accuracy of their judgment using a frame similar to the one in Study 1 ("There is a \_\_\_% chance that I can accurately tell you whether the stock's value will be above or below \$XX.XX at the start of Month 13"). In contrast, those in the low evaluative salience condition sent a message indicating the likelihood of an outcome that happened to match their prediction ("There is a \_\_\_% chance that the stock's value will be [above / below] \$XX.XX at the start of Month 13").<sup>6</sup>

After playing the advisor role, all participants proceeded to play the role of private decision-maker; they were assured that their advice recipient would not be able to access their confidence or predictions for these judgments. Participants then proceeded to make predictions and confidence judgments using a frame consistent with the one they were exposed to while playing the advisor role. To incentivize honest reporting of their confidence, participants were awarded "accuracy points" determined by a modified Brier score (Brier, 1950), which rewards high confidence in accurate guesses and more tempered confidence in inaccurate guesses. The more accuracy points advice recipients earned, the greater their chances of winning a separate raffle for a \$50 bonus payment. To help participants understand exactly how calibration was scored, they were provided with a table demonstrating the number of points they would earn at a

<sup>6</sup> The portion containing [above / below] appeared as a blank line in participants' message so that they knew their message would not reveal their actual prediction unless the advice recipient elected to pay a small fee.

variety of confidence levels, conditional on their prediction accuracy. They were presented with the following instruction to reinforce their understanding of their incentives: “you earn more raffle tickets for a \$50 bonus payment when you honestly report your true confidence in the accuracy of your predictions.”

## Results

As in Study 1, participants exhibited a robust pattern of overconfidence. Compared to their mean confidence of 76%, their predictions were accurate 54% of the time,  $t(361) = 19.11, p < .001$ ; this pattern held across conditions and roles (all  $ps < .001$ ).

Because participants’ confidence judgments were made in the absence of feedback about their accuracy and advisors’ hiring decisions, and could therefore not be impacted by these factors, I collapsed participants’ overconfidence across all five rounds of predictions. A 2 X 2 mixed ANOVA revealed two main effects on participants’ overconfidence (see Figure 1 for conditional means and standard errors). First, participants displayed more overconfidence as advisors than the overconfidence reflected in their judgments as private decision-makers,  $F(1, 360) = 21.94, p < .001, d = 0.49$ . Second, they were more overconfident in the high evaluative salience condition than in the low evaluative salience condition,  $F(1, 360) = 10.33, p = .001, d = 0.34$ .

More importantly, a Role X Evaluative Salience interaction emerged,  $F(1, 360) = 8.15, p = .005, \eta_p^2 = .02$ . Consistent with the strategic self-promotion hypothesis, the evaluative salience manipulation impacted participants’ overconfidence when they played the advisor role,  $t(360) = 4.37, p < .001, d = 0.46$ . Relative to the low evaluative salience condition, participants in the high evaluative salience condition were more overconfident when making judgments as advisors. In contrast, evaluative salience did not impact participants’ overconfidence as private decision-

makers,  $t(360) = 1.38, p = .17$ . This resulted in a pattern where participants' overconfidence as advisors exceeded their overconfidence as private decision-makers in the high evaluative salience condition,  $t(180) = 4.67, p < .001, d = 0.70$ . However, despite making the same predictions using the same response format, their overconfidence as advisors and private decision-makers did not differ in the low evaluative salience condition,  $t(180) = 1.55, p = .12$ . Thus, although participants were overconfident on the whole, they inflated their overconfidence as advisors in relation to their private beliefs—but only when it was highly salient that others were evaluating their competence. This suggests that advisors were deliberately overconfident when they perceived that others were scrutinizing their competence. Further, because participants' greater overconfidence in the high evaluative salience condition did not persist in the private judgments that immediately followed their broadcasted advice, participants did not engage in self-deception.

## **Discussion**

Study 2 provides more direct evidence for the strategic self-promotion hypothesis and sheds further light on why advisors' overconfidence is greater than private decision-makers. Because advisors' overconfidence increased as it became more salient that advice recipients were evaluating their competence, this indicates that their overconfidence increased when it was most apparent that high confidence could allow them to project competence. Critically, this effect only held for the judgments they broadcasted to advice recipients and was not reflected in their judgments as private decision-makers. This suggests that their overconfidence was deliberate and not a byproduct of delusional beliefs resulting from self-deception. Notably, this occurred despite the presence of conditions that are particularly conducive to finding evidence of self-deception. People are particularly motivated to engage in self-deception about their own



abilities after they have engaged in ethically questionable behavior that makes them appear competent to others (Chance et al., 2011). Because participants in the high evaluative salience condition made judgments as private decision-makers *after* inflating their confidence as advisors, they should have been particularly motivated to respond in a manner consistent with those estimates as private decision-makers. However, they actively lowered their confidence as private decision-makers, suggesting that they were aware of their own deceptive behavior.

Although I pretested the manipulation of evaluative salience and found that it impacted advisors' overconfidence in the main study, I did not directly assess whether advisors consciously considered how their confidence would impact advice recipients' perception of their competence. If advisors' inflated confidence in the high evaluative salience condition truly was strategic, then they should have more strongly perceived that their confidence estimates impacted others' evaluation of their competence in the high evaluative salience condition as compared to the low evaluative salience condition. To test this, I conducted a replication study on only the portion of the study where participants played the advisor role and asked advisors at the end of the study about the extent to which they perceived that their confidence estimates would impact advice recipients' perception of their competence. In addition to replicating the effect of evaluative salience on advisors' overconfidence, the study also confirmed that advisors more strongly associated their confidence with advice recipients' perception of their competence in the high evaluative salience condition (see SOM, Study S2B).

### **Study 3: Is Advisors' Strategic Overconfidence Motivated by Self-Interest?**

This strategic self-promotion hypothesis relies on the assumption that advisors strategically inflate their confidence due to a (sometimes mistaken) belief that it will allow them to reap the rewards associated with projecting competence. This is consistent with advisors'

strategic behavior being motivated by self-interest. An alternative explanation for the findings in prior studies is that advisors' strategic overconfidence was not motivated by strategic self-promotion *per se*, but rather by a genuine desire to be helpful.

The hypothesis that people deliberately convey overconfidence as a means of providing estimates others find informative was first advanced by Yaniv and Foster (1995, 1997) as an explanation for the prevalence of overconfidence. Although the authors did not empirically test this assertion by comparing the overconfidence of individuals expressing confidence in front of an audience to those making judgments in private, it remains a popular explanation for the robustness of overconfidence (Moore et al., 2015). According to this account, one potential explanation for advisors' strategic overconfidence is that they express confidence because advice recipients perceive confident judgments to be informative. When they believe others are evaluating their competence, advisors may be particularly likely to recognize that they can tailor their confidence to increase the perceived informativeness of their advice. Communicators sometimes engage in strategic deception that benefits others even when they have no financial incentive to do so (Erat & Gneezy, 2012). This raises the possibility that advisors might deliberately inflate their overconfidence even when it does not serve their self-interest out of a desire to be helpful.

Because Studies 1 and 2 simulated the real-world incentives of advisors whose livelihood depends on their ability to attract clients, it is unclear whether these incentives triggered strategic self-promotion or whether advisors would have inflated their confidence in their absence. While scholars have decried the incentives prevalent in advice markets that reward overconfidence (Kahneman, 2011; Radzevick & Moore 2011; Tetlock, 2005), there has yet to be an empirical test of what causal role these incentives play in driving advisors' overconfidence. Study 3

therefore tests for the impact an incentive to be selected as an advisor, or “hired,” on advisors’ overconfidence in a context involving high evaluative salience. If advisors’ strategic overconfidence is motivated by self-promotion, then they should curb their tendency to inflate their confidence (in relation to their beliefs as private decision-makers) in the absence of a hiring incentive. However, if their overconfidence is instead motivated by a desire to be helpful, then their inflated confidence should persist in the absence of a hiring incentive.

### **Method**

**Participants.** In total, 220 MTurk workers completed the experiment ( $M_{Age} = 33.09$  years,  $SD = 11.01$ , 39% female).

**Procedure.** Study 3 followed a 2 (role: advisor, personal decision-maker) X 2 (hiring incentive: yes, no) mixed design with hiring incentive manipulated between subjects and role varying within subjects. In the interest of providing conditions that elicit strategic overconfidence from advisors, participants followed the same procedure as those in the high evaluative salience condition of Study 2. However, while playing the advisor role, participants were randomly assigned to either receive an incentive to be “hired” by their advisor or not. Those in the hiring incentive condition received the same incentive as advisors in Studies 1 and 2. Participants assigned to the no incentive condition were also entered in a raffle for a \$50 bonus payment but told that the number of times they were hired had no bearing on their chances of winning.

### **Results**

As in Studies 1 and 2, participants exhibited a robust pattern of overconfidence. Compared to their mean confidence of 76%, their predictions were accurate 59% of the time,  $t(219) = 10.67, p < .001$ ; this pattern held across conditions and roles (all  $ps < .001$ ).

A 2 X 2 mixed ANOVA revealed two main effects on participants' overconfidence (see Figure 2 for conditional means and standard errors). First, participants displayed more overconfidence as advisors than the overconfidence reflected in their judgments as private decision-makers,  $F(1, 218) = 9.38, p = .002, d = 0.41$ . Second, they were more overconfident in the hiring incentive condition than in the no incentive condition,  $F(1, 218) = 9.07, p = .003, d = 0.41$ .

More importantly, a Role X Hiring Incentive interaction emerged,  $F(1, 218) = 27.61, p < .001, \eta_p^2 = .04$ . Consistent with participants' behavior being motivated by self-interest, the hiring incentive impacted participants' overconfidence when they played the advisor role,  $t(218) = 5.17, p < .001, d = 0.70$ . Relative to the no incentive condition, participants in the hiring incentive condition were more overconfident as advisors. In contrast, the hiring incentive did not impact participants' overconfidence as private decision-makers,  $t(218) = 0.48, p = .63$ . Replicating Study 2, participants' overconfidence as advisors exceeded their overconfidence as private decision-makers in the hiring incentive condition,  $t(110) = 5.18, p < .001, d = 0.99$ . However, their overconfidence as advisors was slightly *lower* than their overconfidence as private decision-makers in the no incentive condition,  $t(108) = 1.85, p = .067$ . This suggests that advisors' overconfidence was not motivated by a desire to be helpful. Instead, consistent with the assumptions of the strategic self-promotion hypothesis, advisors only inflated their overconfidence above the overconfidence they displayed as private decision-makers when appearing competent served their self-interest.

## Discussion

Study 3 provides further evidence consistent with the strategic self-promotion account in a context involving high evaluative salience. As in Study 2, advisors deliberately inflated their

confidence in the presence of an incentive to have advice recipients elect to receive their advice. In the absence of the incentive, however, they no longer inflated their confidence. Further, because the incentive did not impact participants' judgment as private decision-makers, this suggests that it did not trigger self-deception. This corroborates the findings of Study 2 and provides additional evidence that advisors consciously engaged in self-promotion without biasing their own judgment.

More importantly, Study 3 provides direct evidence that advisors' strategic overconfidence was motivated by a desire to self-promote in situations where it serves their self-interest. Although other scholars have suggested that one mechanism for the prevalence of overconfidence is that people deliberately communicate it in order to provide information that others find helpful and informative (Yaniv & Foster, 1995, 1997), this hypothesis has not been empirically tested by comparing the judgments of private-decision makers to communicators broadcasting judgments to an audience (Moore et al., 2015). Study 3 finds evidence that this hypothesis cannot completely account for advisors' strategic overconfidence. Because the removal of an incentive to self-promote completely curbed (and even slightly reversed) advisors' strategic overconfidence, this suggests that their overconfidence was not strictly motivated by considerations about the informativeness of their advice. Had advisors genuinely been motivated by a desire to provide helpful advice, they would have continued to inflate their confidence even when doing so did not serve their self-interest.

It is noteworthy that participants in Studies 2 and 3 always played the private decision-maker role after playing the advisor role and were incentivized to be make accurate judgments. Although these aspects of the study design were critical in order to adequately test for evidence of self-deception, it raises the possibility that idiosyncrasies of these aspects of the design could

have driven advisors' strategic overconfidence in the presence of incentives to self-promote when evaluative salience is high. To rule out this possibility, I collected data from a sample of undergraduate business students assigned to the hiring incentive condition in Study 3 (see SOM, Study S3). However, I modified the condition such that participants' estimates as private decision-makers were (a) not tied to accuracy incentives and (b) always elicited prior to playing the advisor role. As in Studies 2 and 3, advisors' overconfidence exceeded the overconfidence reflected in their judgments as private decision-makers. This suggests that their strategic overconfidence in situations involving high evaluative salience and the presence of a hiring incentive are unlikely to be explained by the ordering of judgments or the presence of an accuracy incentive. Study 4 addresses this issue further by counterbalancing the order of judgments and not providing participants with an accuracy incentive.

#### **Study 4: Strategic Self-Promotion in Confidence Intervals**

Study 4 examines whether advisors' strategic overconfidence persists with an alternative signal of their confidence: the margin of error surrounding their judgment. The most robust way of eliciting overconfidence is to ask people to provide a confidence interval around their numerical estimate of some quantity such that the confidence interval contains the quantity's true value a prespecified percentage of the time (Alpert & Raiffa, 1982; Klayman et al., 1999). The narrower an individual's confidence interval, the more confident the individual is that his or her estimate is close to the truth.

In addition to showing that the findings of Studies 1-3 are robust to an alternative measure of overconfidence, Study 4 aims to generalize beyond situations where an advice recipient must pay for advice. Aside from advising clients, advisors might also advise their employer and colleagues in situations where they have relevant domain expertise for solving a

problem at hand. While they may not earn a commission for providing sound advice, advisors' ability to project competence in these situations can impact their chances of achieving economically valuable outcomes like promotions and performance bonuses. Study 4 therefore attempts to extend beyond the idiosyncrasies of advisor-client interactions by conceptually replicating many key features of advice-giving contexts. However, rather than testing the effect of an incentive to be hired by a client, the study tests whether a more general incentive to be perceived as competent by an audience causes communicators to strategically inflate their confidence in relation to their judgments as private-decision makers when others are clearly evaluating their competence.

### **Method**

**Participants.** In total, 360 MTurk workers completed the experiment ( $M_{\text{Age}} = 36.92$  years,  $SD = 11.42$ , 51% female).

**Procedure.** Study 4 followed a 2 (role: communicator, private decision-maker) X 2 (self-promotion incentive: yes, no) mixed design with self-promotion incentive manipulated between subjects and judgment publicity manipulated within subjects. Participants completed a weight-guessing task adapted from prior research where they viewed five different full-body photos of different individuals and provided a 90% confidence interval for the weight of each pictured individual (Gino & Moore, 2007; Moore & Klein, 2008). To do this, they gave both a "lower bound" and "upper bound" (in their choice of pounds or kilograms) such that there was only a 5% probability that the pictured individual could weigh less (lower bound) or more (upper bound) than that number (see Moore, Carter, & Yang, 2015). Participants played the role of both communicator and private decision-maker in a randomized, counterbalanced order.

**Communicator role.** Prior to playing the communicator role, participants learned that there was a 10% chance of having a subset of their judgments displayed to a future evaluator (described as another MTurk worker) who would be judging their expertise at weight guessing. To maintain the appearance of an expertise asymmetry between potential evaluators and participants that mimics the expertise asymmetries inherent in most advisor-client interactions (Radzevick & Moore, 2011; Sah et al., 2013), evaluators were described as only having access to participants' confidence interval estimates and a face-only version of each photo when evaluating their expertise (in contrast participants' full-body photos).

Participants were randomly assigned to self-promotion incentive or no incentive conditions. In the self-promotion incentive condition, participants learned that their judgments as communicators would impact their final payment. Specifically, they were informed that, if they were selected to have their public judgments evaluated, they would earn "expertise points" such that the more expertise others perceived them to possess at weight guessing, the higher their expected bonus payment (maximum: \$10). To reinforce the manipulation, participants read: "your expected bonus payment is the highest when others think you have expertise at weight guessing on the basis of your lower bound and upper bound estimates."

In the no incentive condition, participants also knew their public confidence interval estimates would potentially be evaluated by someone else to assess their expertise. However, they also learned that this assessment would have no bearing on their final payment.

**Private decision-maker role.** Prior to playing the private decision-maker role, participants learned that their confidence interval estimates would not be shown to anybody else and would have no bearing on their final payment. They then proceeded to make judgments about the same set of photos as they did in the communicator role.



**Measuring overconfidence.** As in prior studies, I measured overconfidence by regressing each participant's confidence on his or her accuracy and retaining the standardized residuals. Because high confidence corresponds to smaller (i.e., narrower) confidence intervals, I multiplied the resulting residuals by negative one so that higher values correspond to more overconfidence. Further, unlike prior studies, where participants' accuracy could only be judged by whether their predictions turned out to be accurate, an advantage to studying confidence intervals is that their accuracy can be judged on a continuum based on how closely they are centered around the true value (Yaniv & Foster, 1995, 1997). Therefore, I computed participants' accuracy by taking the midpoint of their confidence intervals and then taking the absolute difference between this value and the true weight of each pictured individual.

## Results

Participants exhibited a robust pattern of overconfidence, as their 90% confidence intervals only contained the correct weight 61% of the time,  $t(359) = 20.85, p < .001$ . This pattern held across conditions and roles (all  $ps < .001$ ).

I conducted a 2 X 2 mixed ANOVA on participants' overconfidence (see Table 2 for conditional means and standard deviations). A main effect emerged where the self-promotion incentive generally increased participants' overconfidence,  $F(1, 358) = 7.99, p = .005, d = 0.30$ . I did not find evidence of a role main effect,  $F(1, 358) = 1.43, p = .23$ .

More importantly, a Role X Self-Promotion Incentive interaction emerged,  $F(1, 358) = 5.97, p = .015, \eta_p^2 = .02$ . Consistent with advisors in Study 3, the self-promotion incentive impacted participants' overconfidence when they played the communicator role,  $t(358) = 3.72, p < .001, d = 0.39$ . Relative to the no incentive condition, participants in the self-promotion incentive condition were more overconfident when making judgments as communicators. Although the self-promotion incentive elicited a similar effect on participants' overconfidence as

private decision-makers, the effect was smaller in magnitude,  $t(358) = 1.77, p = .078, d = 0.19$ .

This difference in the extent to which the self-promotion incentive increased participants' overconfidence as communicators versus their overconfidence as private decision-makers resulted in a pattern where communicators' overconfidence exceeded private decision-makers' overconfidence in the self-promotion incentive condition,  $t(181) = 2.03, p = .044, d = 0.30$ .

However, their overconfidence as communicators did not differ from their overconfidence as private decision-makers in the no incentive condition,  $t(177) = 1.46, p = .15$ . As with the prior studies, this supports the strategic self-promotion hypothesis.

## **Discussion**

Study 4 extends on the prior studies by demonstrating that the strategic self-promotion hypothesis extends to advisors' judgments about the margin of error surrounding their judgment. Although Yaniv and Foster (1995, 1997) have suggested that one reason for the excessive narrowness of individuals' confidence intervals is their desire to provide estimates that others find informative, they only examined the confidence intervals of private decision-makers and did not collect judgments from communicators presenting confidence intervals to an audience. This study provided an opportunity to directly compare the width of participants' confidence intervals as communicators to their intervals as private decision-makers. Communicating to an audience alone did not cause participants to express narrower confidence intervals. Instead, consistent with Study 3 and the strategic self-promotion hypothesis, their publicly broadcasted confidence intervals were only narrower than their private judgments when conveying expertise served their self-interest.

Further, by demonstrating that more general self-promotion incentives cause communicators to convey more overconfidence than reflected by their private beliefs, the results

of Study 4 suggest that the findings in prior studies extend beyond advisor-client interactions. Although communicators were not playing an advisor role per se, they were nonetheless broadcasting their confidence to an audience with inferior domain expertise attempting to evaluate their competence. Because an incentive to project expertise elicited strategic overconfidence, this suggests that expert advisors are likely motivated to display overconfidence in a variety of situations where appearing competent serves their self-interest.

### **Study 5: Strategic Overconfidence Among Advice Professionals**

Collectively, Studies 1-4 provide evidence of a robust pattern where advisors (and communicators more generally) deliberately express overconfidence to the extent that they believe self-promoting their expertise to an audience will serve their self-interest. Although the studies attempted to simulate the dynamics of real-world advice contexts, it is unclear whether this pattern generalizes to the real-world behavior of advice professionals. Study 5 therefore tests whether advice professionals' self-reported overconfidence increases in situations where projecting expertise serves their self-interest.

#### **Method**

**Participants.** Based on a preregistered data collection rule, 100 advice professionals completed the study ( $M_{\text{Age}} = 41.34$  years,  $SD = 11.65$ , 60% female,  $M_{\text{Industry Experience}} = 13.37$  years,  $SD = 9.17$ ). Participants were recruited through a Prime Panel managed by CloudResearch.<sup>7</sup> Prior to being invited to complete the study, potential participants were prescreened on the basis of their employment in occupations that are typically associated with advising others (accounting, consulting, finance, human resources, IT, legal, marketing, sales), their identification of advising others as a primary function of their job, and their passage of a

<sup>7</sup> Prime Panels is a compilation of online research panels that provides access to a larger, more diverse pool of participants than Amazon Mechanical Turk.

customized screener verifying that they could describe a recent situation at work where they advised others. After following a preregistered procedure to eliminate participants who provided incomplete or nonsensical responses, 94 participants were included in the final analyses; the results hold in analyses of all 100 participants.

**Procedure.** Participants were prompted to write about two situations where somebody solicited their advice at work (randomized and counterbalanced order) and assured the confidentiality of their written responses. In one of the situations, they had an incentive to engage in self-promotion. In the other, they did not. Participants read the following prompt [self-promotion incentive condition / no self-promotion incentive condition]:

Think of a time at work when somebody solicited your advice about something you were uncertain about and you felt that your ability to convince the person about your expertise was [critical to / not going to impact your chances of] retaining a client's business, keeping your job, earning a commission, earning a performance bonus, or earning a promotion.

Participants described each situation and then proceeded to indicate whether, when interacting with others in the situation described, they (a) conveyed more confidence than they knew was justifiable at the time (deliberate overconfidence), (b) an appropriate level of confidence (appropriate confidence), or (c) less confidence than they knew was justifiable at the time (deliberate tempered confidence).

To incentivize participants to answer honestly, I applied the Bayesian Truth Serum algorithm (Prelec, 2004), which rewards participants for answering honestly by comparing their responses to the mean of participants' estimates for how prevalent each response is in the entire sample. This scoring system rewards "surprisingly common" responses and penalizes

“surprisingly uncommon” responses. Rather than explaining it in detail to participants, they simply read that “the important property of the formula is that it rewards truthful answers” and were provided with a link to the paper describing the algorithm. Consistent with prior research estimating the prevalence of ethically questionable behaviors (John, Loewenstein, & Prelec, 2012), I made a donation to participants’ charity of choice and informed them that the size of the donation made on their behalf would increase with their truthfulness. Research has demonstrated that these procedures compare favorably to other honesty-inducing techniques at increasing truth-telling in situations involving admissions of socially undesirable behaviors (John et al., 2012; Weaver & Prelec, 2013).

## Results

Following a preregistered data analysis plan, I examined participants’ confidence using a multilevel ordered logistic regression model that nested responses within participants using a participant-specific random intercept. Consistent with the prior studies, participants conveyed more confidence in the presence of a self-promotion incentive,  $B = 0.83$  ( $SE = 0.30$ ),  $z = 2.75$ ,  $p = .006$ ,  $OR = 2.30$ . A follow-up multilevel logistic regression on participants’ deliberate overconfidence (1 = deliberate overconfidence, 0 = appropriate confidence or deliberate tempered confidence) revealed a main effect of the self-promotion incentive,  $B = 1.17$  ( $SE = 0.36$ ),  $z = 3.26$ ,  $p = .001$ ,  $OR = 3.24$ . Relative to the no incentive condition (16%), participants were more likely to indicate that they conveyed more confidence than they knew was justifiable in situations involving a self-promotion incentive (37%). In contrast, a separate follow-up logistic regression on participants’ deliberate tempered confidence (1 = deliberate tempered confidence, 0 = appropriate confidence or deliberate overconfidence) did not find evidence of the self-promotion incentive impacting participants’ likelihood of self-reporting that they conveyed

less confidence than they knew was justifiable,  $B = -0.19$  ( $SE = 0.44$ ),  $z = 0.44$ ,  $p = .66$ . This suggests that the self-promotion incentive increased participants' confidence primarily through increasing their likelihood of deliberately conveying overconfidence, but not by reducing their likelihood of deliberately conveying tempered confidence.

## **Discussion**

Study 5 corroborates the previous studies in the self-reports of advice professionals. Consistent with the prior studies, advisors were more likely to admit to strategically displaying overconfidence in situations where self-promoting their expertise to others served their self-interest than in situations where it did not.

### **General Discussion**

The current research tests for whether overconfident advice is driven by a process of cogently learning and adapting to advice recipients' preferences or a byproduct of a robustly applied self-promotion tactic where advisors strategically inflate their confidence in order to reap its rewards. Although scholars have suggested that advice seekers' inability to adequately penalize overconfidence is partly to blame for the prevalence of overconfident advice (Radzevick & Moore, 2011; Ronay et al., in press; Tetlock, 2005), the results of the current research suggest that simple accountability is unlikely to temper advisors' strategic overconfidence. Even when paired with an advice recipient who penalized confidence on the balance, advisors were more overconfident than private decision-makers; this overconfidence persisted in the face of feedback about advice recipients' decisions. Instead, advisors' overconfidence appears to reflect a robust pattern of strategic self-promotion where they deliberately inflate their overconfidence to the extent that it is (a) highly salient that others are evaluating their expertise and (b) projecting competence serves their self-interest.

Because prior overconfidence research has almost exclusively focused on either the perspective of private decision-makers or advisors communicating publicly without differentiating between advisors' public communications and private beliefs (Meikle et al., 2016; Moore et al., 2015), the current research offers valuable insight into how the strategic social considerations inherent in many advice contexts might exacerbate overconfidence. In so doing, it informs a number of theoretical accounts that have been offered for the social motivations underlying overconfidence. Further, in identifying the causal impact of several key features of advice contexts on advisor overconfidence, the current research offers several practical implications for managers and other types of organizational decision-makers hoping to reduce their exposure to overconfident advice.

### **Theoretical Implications**

The current research makes several important theoretical contributions to the literatures on overconfidence and advice giving. First, it offers an explanation for the prevalence of overconfident advice. In contrast to the private decision contexts typically studied by overconfidence researchers (e.g., Haran et al., 2010; Juslin et al., 2007; Klayman et al., 1999; Moore et al., 2015), advice contexts present advisors with strategic social considerations that alter their recommendations (Kray, 2000; Kray & Gonzalez, 1999) and information search (Jonas & Frey, 2003; Jonas et al., 2005). The current research documents yet another manner in which advice contexts shape individuals' judgment: They can motivate them to become more overconfident when giving advice. A fundamental aspect of many real-world advice contexts is that they present advisors with motives to project competence to an audience (Radzevick & Moore, 2011; Tetlock, 2005). As demonstrated by the current research, these motives can result in advisors strategically employing overconfidence as a means of self-promoting their expertise.

Although some have suggested that advisors' overconfidence emerges as a byproduct of advice seekers' failure to hold them accountable (Radzevick & Moore, 2011; Ronay et al., in press; Tetlock, 2005), the current findings indicate that this account might oversimplify the underlying causes of advisors' overconfidence. While accountability can reduce the overconfidence of private decision-makers (Tetlock & Kim, 1987), it does not appear to override advisors' tendency to strategically display it in situations where they are motivated by self-promotion.

A second contribution of this research is in documenting precisely *how* self-promotion motivates advisor overconfidence. Although social motives to appear competent can sometimes delude individuals into becoming genuinely overconfident (Anderson et al., 2012; Schwarzmann & Van der Weele, 2019), advisors exhibited a pattern of *strategic* overconfidence such that their publicly communicated confidence was elevated in relation to the overconfidence reflected by their private beliefs. In combination with the self-reports of advice professionals, this indicates that they were deliberately overconfident while engaging in self-promotion. This adds to prior findings that advisors' communicated beliefs sometimes diverge from those they hold privately (Kray 2000; Kray & Gonzalez, 1999; Jonas & Frey, 2003; Jonas et al., 2005).

Third, the current research points to advisors' self-interest as a key driver of their strategic overconfidence. One popular explanation for the prevalence of overconfidence is that people are deliberately overconfident in order to be informative to others (Yaniv & Foster, 1995, 1997). However, because scholars have largely neglected to consider how communicators' confidence varies in private versus in front of an audience, the current research offers one of the first direct tests of this hypothesis. While advisors did inflate their overconfidence in relation to their private beliefs, this only occurred when projecting competence to an audience was in their



self-interest. This suggests that self-promotion, rather than a genuine desire to be informative, motivates advisor overconfidence.

Finally, the current research offers more general insights into when social motives can exacerbate overconfidence. Scholars often assume that people deliberately exploit the benefits of confidence when communicating to an audience (e.g., Meikle et al., 2016; Van Zant & Moore, 2013), but direct supporting evidence has proven to be surprisingly elusive (Moore et al., 2015). Because previous failed attempts at detecting this effect are largely unpublished and anecdotal at present, it is difficult to ascertain precisely what methodological features might differentiate the current studies from prior attempts. However, the current research suggests that the effect is particularly likely to emerge in contexts where communicators perceive that an audience is evaluating their competence and self-promotion serves their self-interest.

### **Practical Implications**

The current research also offers some key insights for managers and decision-makers hoping to reduce their exposure to overconfident advice. One insight is that, despite one's best efforts, attempting to hold overconfident advisors accountable is unlikely to be sufficient in reducing one's exposure to overconfident advice. Strategic overconfidence is such a robustly applied tactic that advisors continued to rely on it even in the presence of feedback that their overconfidence was undermining their economic success. This is consistent with prior research suggesting that people often fail to learn from real-world feedback about how their behavior impacts others' decisions (Ball et al., 1991; Zlatev et al., 2017). Of course, real-world feedback is noisy; advice recipients could instead choose to remove all ambiguity from the equation. Clients could choose to blatantly state a preference for tempered confidence in advisors and managers could promote an organizational culture that only rewards employees who display

tempered confidence. But these approaches could quickly backfire by encouraging advisors to be strategically *under*confident. At that point, advisors' confidence would have little discriminate value in helping advice recipients understand when their predictions are more or less likely to be accurate (Price & Stone, 2004; Yates, Price, Lee, & Ramirez, 1996). Because confidence tends to be correlated with accuracy (McKenzie, Liersch, & Yaniv, 2008), this would render a valid (albeit overapplied) cue to advisors' accuracy useless.

The current research does, however, offer some promising solutions for curbing advisors' strategic overconfidence. One is that advice seekers hoping to receive honest confidence estimates should avoid advisors who are primarily compensated on the basis of their ability to recruit clients, take on new accounts, or solicit hourly consultation fees. Instead, they might opt for advisors who are salaried or earn bonuses on the basis of client satisfaction. Likewise, organizational leaders might aim to promote an organizational culture where employees do not constantly perceive that their future prospects in the organization hinge on their response to a superior's question.

However, incentives to self-promote are often unavoidable. What can managers and advice seekers do in these situations? Avoiding the impression that they are scrutinizing advisors' competence when posing questions appears to be critical. A simple way to accomplish this is through framing questions about advisors' confidence in a manner that refers to the likelihood of events, as opposed to advisors' judgmental accuracy. Whereas advisors are relatively unlikely to perceive that their competence is under scrutiny when they are posed questions framed around event likelihoods (e.g., "How likely is [outcome] to occur?"), it becomes highly salient that others are evaluating their competence when they are posed

questions framed around their judgmental accuracy (e.g., “How confident are you that your prediction about [outcome] is accurate?”).

### **Limitations and Future Directions**

The current research also raises several noteworthy theoretical and methodological issues. First, it does not truly address the question of how people come to associate overconfidence with strategic self-promotion in the first place. Although advisors in the current studies did not show evidence of adapting to advice recipients’ preferences, a lifetime of repeated exposure to audiences who reward overconfidence might have already ingrained the idea that overconfidence is rewarded in a variety of situations (Johnson & Fowler, 2011). Thus, communicators might be so strongly socialized to use overconfidence as a self-promotion tactic that they fail to adapt in situations where overconfidence backfires. Yet another possibility could be that communicators’ strategic overconfidence emerges as a byproduct of perspective-taking. If advisors tend to take the perspective of advice recipients, they should recognize that they would personally reward a confident advisor and act on this inference by inflating their confidence. Research that considers precisely how communicators develop lay intuitions about others’ likely response to strategic overconfidence could shed light on why people display confidence as a means of self-promotion.

Another question unanswered by the current research concerns whether advisors continue to rely on overconfidence as a strategic self-promotion tactic in the presence of opportunities to provide a rationale for their confidence to their audience. While many advice contexts containing self-promotion incentives do not provide advisors with the opportunity to provide detailed justifications for their confidence until they are “hired” by a client (Radzevick & Moore, 2011), it could be possible that advisors might not display inauthentic confidence when provided with

an opportunity to rationalize their uncertainty. I considered this possibility in one study but continued to find evidence that self-promotion incentives cause advisors to inflate their overconfidence in a context where they have an opportunity to provide their audience with written explanations for their confidence (see Study S4 of the SOM). However, it could be possible in some circumstances that advisors might combine tempered confidence with a compelling rationale in an effort to provide a unique and contrarian perspective.

Relatedly, it is noteworthy that advisors in the current studies were always in a position of relative expertise. Expertise asymmetries are an inherent feature of most advisor-client interactions and many situations where organizational members lacking expertise seek the input of others with relevant domain expertise (Radzevick & Moore, 2011; Sah et al., 2013). However, the focus on these contexts in the current research raises the possibility that the expertise of one's audience is a critical boundary condition to communicators' general reliance on overconfidence as a means of strategic self-promotion. While novice audiences may be perceived as too ignorant to understand the degree of uncertainty involved in a situation, and thus unlikely to recognize when one's confidence is inappropriately high, communicators might perceive that audiences with relevant domain expertise are likely to diagnose inappropriately high levels of confidence. There may even be a possibility that in some cases, expressing a lack of confidence in one's predictions by raising a novel source of *uncertainty* that other experts are unlikely to have previously considered might be a preferred means of signaling one's competence.

It also might be worth considering alternative ways that advisors might display strategic overconfidence. For example, advisors' strategic overconfidence could manifest itself in the form of their nonverbal behavior. In contrast to explicit verbal statements of confidence that can later be used to hold advisors accountable, it is difficult to peg communicators as poorly

calibrated on the basis of their nonverbal behavior (Tenney et al., 2018). Given that nonverbal displays of confidence influence perceivers' judgment and choice (Van Zant & Berger, in press), this raises the possibility that strategic overconfidence expressed through nonverbal channels may be more rampant and go unchecked more frequently than the more explicit forms of verbal overconfidence examined in this research.

### **Conclusion**

Whether playing the role of a consumer seeking professional advice about an important life decision, an employee seeking a coworker's opinion, or even a manager soliciting employee input while devising a course of action, we all stand to benefit from well-calibrated advisors. While it may be tempting to think that holding people accountable for their overconfidence should force them to rethink their instincts to self-promote through displays of overconfidence, recent events call this conclusion into question. Donald Trump's persistence in confidently making a number of dubious claims despite being repeatedly exposed by the media and websites like PolitiFact is one example that comes to mind. The current findings are similarly pessimistic about the efficacy of accountability mechanisms at changing advisors' behavior. With social media providing more avenues for advice professionals to self-promote their expertise than ever before, accountability mechanisms are unlikely to override their tendency to be strategically overconfident. Instead, advice seekers would be better served by putting advisors' concerns about being evaluated at ease and more generally rethinking how they choose to reward advisors.

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Table 1

*Study 1: Regressions Predicting Overconfidence*

Variable	Model 1	Model 2	Model 3	Model 4
Advisor Role	0.23* (0.10)	0.22* (0.10)	0.29** (0.10)	0.39** (0.13)
Round	0.01* (0.01)	0.02** (0.01)	0.02** (0.01)	0.02** (0.01)
Prior Round Confidence		0.01*** (0.002)	0.01*** (0.002)	0.01*** (0.002)
Prior Accuracy		0.05 (0.03)	0.11* (0.05)	0.11* (0.05)
Advisor Role X Prior Accuracy			-0.11† (0.07)	-0.13† (0.07)
Advisor Role X Round				-0.02 (0.01)

*Note.* Numbers represent coefficient estimates (standard errors in parentheses). All models are linear regression models that nest estimates within participants using a participant-specific random intercept. Advisor Role = 0 for private decision-makers, 1 for advisors; Prior Accuracy = 0 for inaccuracy in prior round, 1 for accuracy in prior round. †  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Table 2

*Study 4: Overconfidence by role and self-promotion incentive*

	Role	
	Communicator	Private Decision-Maker
Self-Promotion Incentive	0.17 <sup>a</sup> (0.64)	0.07 <sup>b</sup> (0.87)
No Self-Promotion Incentive	-0.14 <sup>c</sup> (0.95)	-0.10 <sup>bc</sup> (0.97)

*Note.* Numbers represent conditional means (standard deviations in parentheses). Cells with different superscripts differ at  $p < .05$ .



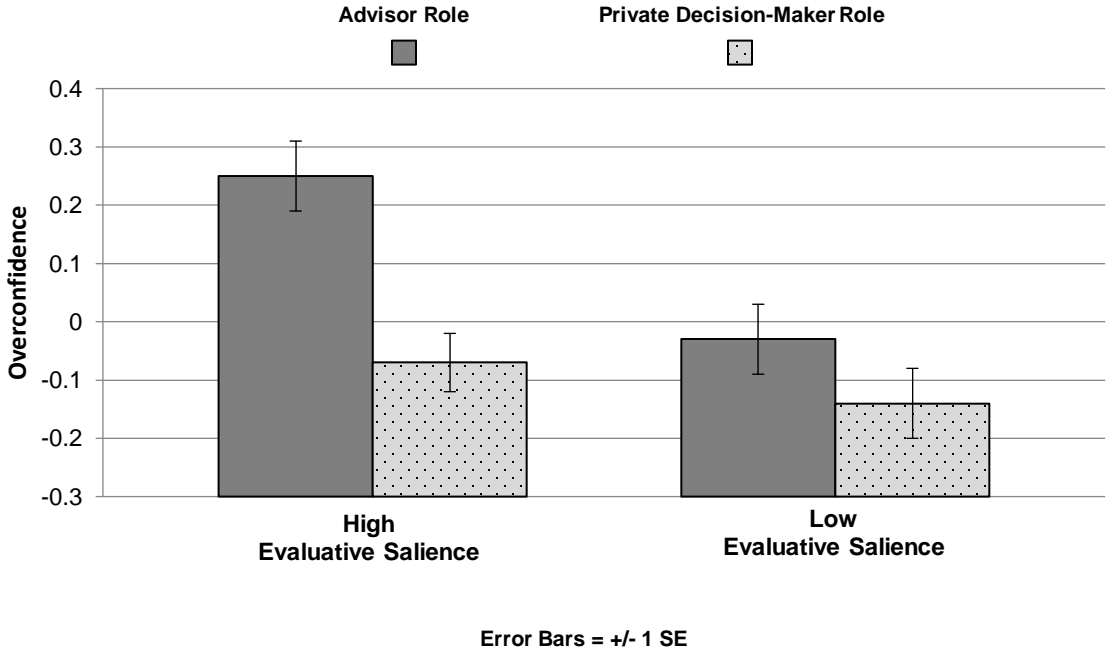
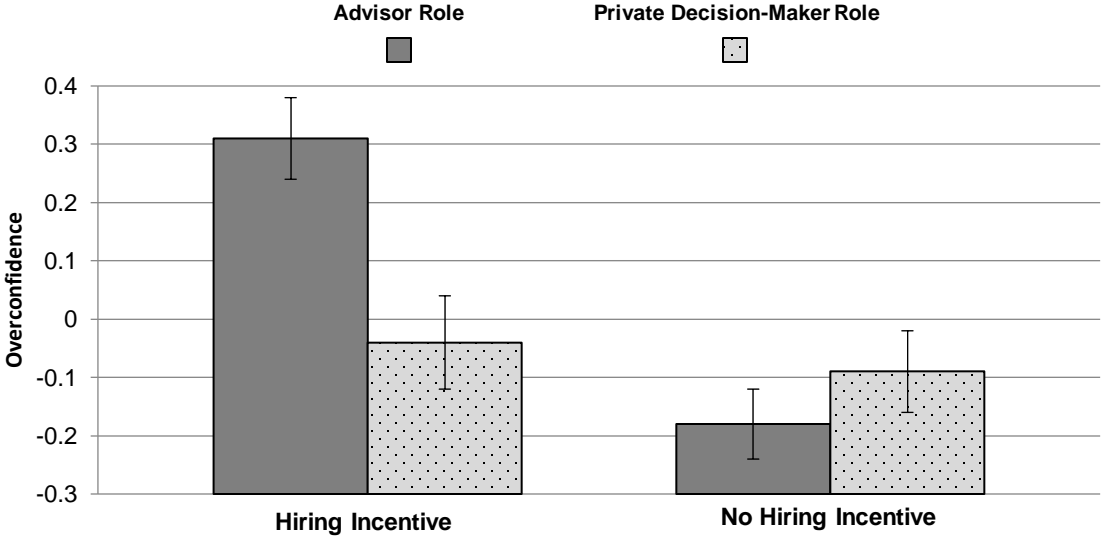


Figure 1. Study 2: Overconfidence by role and evaluative salience.



Error Bars = +/- 1 SE

Figure 2. Study 3: Overconfidence by role and hiring incentive.