Certainty Posturing: Evidence of Inauthentic Certainty Displays as Strategic Impression Management

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Abstract

People who convey certainty often reap economic and social rewards, but little is known about whether they strategically broadcast certainty to reap these rewards. The current research finds evidence of inauthentic certainty displays, or *certainty posturing*, in advice contexts. The behavior is marked by a pattern of strategic impression management. First, the research provides evidence that when the economic value of impression management is increased through advice fees and expertise-signaling incentives, communicators inflate their public certainty displays in relation to their private beliefs. Second, it demonstrates that advisors' public certainty displays diverge from their private beliefs under internal uncertainty, but not under external uncertainty, where they perceive certainty displays as less instrumental towards achieving impression management goals. Finally, it finds that impression management considerations trigger certainty posturing even when communicators can rationalize their uncertainty to evaluators. In addition to exacerbating overprecision in advice, certainty posturing also biases advisees' judgment.

Keywords: certainty, impression management, advice, overconfidence, overprecision

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Whether a politician expected to possess expertise in foreign and domestic affairs or even a consultant expected to have specialized tacit knowledge, people often expect experts to convey a sense of certainty in their ability to make sound decisions. For example, in describing the demands Barack Obama faces as President of the United States, journalist Michael Lewis (2012) wrote, "after you have made your decision, you need to feign total certainty about it. People being led do not want to think probabilistically" (p. 5). As suggested by Lewis, social pressures can motivate certainty displays even to the point where they are disingenuous.

Indeed, conveying certainty brings myriad rewards. Whether looking at financial outcomes (Radzevick & Moore, 2011), social status (Anderson, Brion, Moore, & Kennedy, 2012; Tetlock, 2005), or influence over others (Hinsz, 1990; Petty, Briñol, & Tormala, 2002; Sniezek & Van Swol, 2001; Van Swol & Sniezek, 2005; Zarnoth & Sniezek, 1997), experts who convey the most certainty often accrue the most social and economic rewards. Though they may privately be aware that some information they are about to disclose is highly uncertain, they are often incentivized and expected to convey that they know this information to be true with a high degree of certainty.

Consistent with this notion, there is ample research documenting a robust form of overconfidence known as overprecision, which is characterized by individuals' excessive display of certainty in the accuracy of their own judgment and ability to forecast the future (Haran, Moore, & Morewedge, 2010; McKenzie, Liersch, & Yaniv, 2008; Moore & Healy, 2008; Soll & Klayman, 2004). Though many have characterized it as a cognitive bias (e.g., Frederick, Loewenstein, & O'Donoghue, 2002; Juslin, Winman, & Hansson, 2007; Kahneman & Lovallo,

1993; Tversky & Kahneman, 1974), scholars such as Yaniv and Foster (1995, 1997) have gone as far as to suggest that overprecision in judgment may be explained by social motives. That is, when people consider others' preference for certainty, this may motivate them to overstate their degree of certainty. Despite this perfectly sensible hypothesis, direct supporting evidence has been surprisingly elusive, as scholars have largely failed to find evidence that communicators' overprecision is influenced by audience considerations (Moore, Tenney, & Haran, 2015).

The current research provides evidence of certainty displays motivated by strategic impression management while identifying its antecedents and exploring its consequences in advice contexts. First, it examines when people are most motivated to engage in *certainty posturing*, or strategically exaggerating the degree to which they are certain of the truth. In so doing, it identifies the presence of expertise-signaling incentives and the attribution of uncertainty as factors that cause advisors to deliberately elevate their public displays of certainty relative to their private beliefs. Second, it identifies an important consequence of certainty posturing—namely that it exacerbates overprecision in judgment. Overall, this research makes several important theoretical and empirical contributions to the literatures on overconfidence, impression management, and advice giving by documenting that strategic impression management can influence expert judgment and the communication of uncertainty.

Certainty Posturing as Impression Management in Advice Contexts

Certainty posturing primarily has the potential to be successful as an impression management tactic in situations where an individual has relative domain expertise or is known to have privileged information. Though people fail to adequately consider others' information and forecasts when making their own decisions (Yaniv, 2004; Yaniv & Kleinberger, 2000), they are much more likely to incorporate information derived from expert judgment when it relates to a

domain in which they lack expertise (Harvey & Fischer, 1997; Sniezek, Schrah, & Dalal, 2004). As such, individuals who are perceived as possessing domain expertise are more likely to be relied upon for advice than those who lack domain expertise. Furthermore, because domain expertise increases individuals' confidence in the accuracy of their own judgment (Mahajan, 1992; Önkal, Yates, Simga-Mugan, & Öztin, 2003; McKenzie et al., 2008), it makes them less likely to incorporate others' advice into their own decisions (Bonaccio & Dalal, 2006).

Asymmetries in domain expertise are common in advice-giving contexts where expert advisors provide information and make recommendations to novice advisees. Advisors are often genuinely concerned about making the most accurate recommendations possible (Jonas & Frey, 2003; Kray, 2000), yet they also frequently provide advice that deviates from the decisions they make in private (Jonas & Frey, 2003; Jonas, Schulz-Hardt, & Frey, 2005; Kray, 2000; Kray & Gonzalez, 1999; Sah & Loewenstein, 2015). While research has focused on discrepancies between advisors' private beliefs and their public advice with respect to their presentation of factual information (e.g., Jonas & Frey, 2003; Jonas et al., 2005) or weighting of decision attributes (e.g., Kray, 2000), it has yet to consider biases in the confidence that advisors project to advisees regarding the accuracy of their own judgment. Because advisors are motivated to present information in a manner that generates favorable impressions of themselves (Jonas & Frey, 2003; Jonas et al., 2005), then to the extent that they perceive displays of certainty as a means to accomplishing impression management goals, they should be particularly likely to engage in certainty posturing.

Indeed, advisors who express certainty are perceived as more credible and are more likely to be relied upon than advisors who express uncertainty (Radzevick & Moore, 2011; Phillips, 1999; Price & Stone, 2004; Sah, Moore, & MacCoun, 2013; Sniezek & Buckley, 1995; Sniezek

& Van Swol, 2001; Petty et al., 2002; Van Swol & Sniezek, 2005; Tenney, MacCoun, Spellman, & Hastie, 2007; Tenney, Spellman, & MacCoun, 2008; Yaniv, 1997). Consequently, those who convey certainty in their judgment stand to benefit.

Is Certainty Posturing Strategic?

Though direct evidence of an effect consistent with certainty posturing is largely nonexistent from an empirical standpoint, there are several theoretical frameworks that would predict the effect. First, I discuss the possibility that certainty posturing arises from *motivated reasoning* where individuals' desire to appear certain biases their private judgments. I then propose an alternative account where certainty posturing reflects a pattern of *strategic impression management* such that impression management motives cause individuals' public claims to diverge from their private beliefs.

Certainty Posturing as Motivated Reasoning

One theoretical perspective that would predict certainty posturing is one where a desire to appear certain can trigger motivated reasoning processes that genuinely bias communicators' judgment. That is, because of the social benefits that come with certainty, people may be motivated to arrive at the conclusion that their judgments are accurate with a high degree of certainty. There is a long line of evidence suggesting that motives to arrive at a preferred conclusion can bias individuals' judgment even when it is in their best interest to be as accurate as possible (Kunda, 1990). For example, people selectively forget factual information that contradicts their own past behavior (Shu & Gino, 2012; Shu, Gino, & Bazerman, 2011) and fail to discount clearly biased estimates that support a desired conclusion (Boiney, Kennedy, & Nye, 1997). Relatedly, people who are given an opportunity to benefit from inflating their self-reported performance on a task often delude themselves by aligning predictions about their

future performance on the same task with their inflated claims—thus resulting in costly forecasting errors (Chance, Norton, Gino, & Ariely, 2011). Taken together, these findings suggest that in situations where people stand to benefit from conveying certainty, they will convince themselves that they are highly certain in their judgment, thereby biasing their own judgment.

Anderson et al. (2012) outline a status-enhancement account of overconfidence that is consistent with this reasoning. Specifically, the authors argue that motives to attain social rewards bias individuals' judgment and exacerbate overconfidence. Although they do not study overprecision per se, the authors find evidence that people who are motivated to attain status also exhibit the most overconfidence in their relative abilities. In one study (Study 6), they show that merely priming status motives can increase individuals' confidence in their relative abilities. Importantly, individuals' judgments were assessed in private, which suggests that although their judgments were not publicized in a way that could allow them to reap any rewards for projecting confidence, social motives to appear confident nonetheless biased their own judgment. This status-enhancement account and other theoretical accounts of motivated reasoning suggest that impression management motives can cause individuals to align their private beliefs with any certainty they are motivated to publicly convey. Ultimately, this can result in a pattern where impression management motives not only exacerbate overprecision in communicators' public judgments, but also bias their private judgments.

Certainty Posturing as Strategic Impression Management

An alternative account examined in the current research is that certainty posturing is a deliberate behavior motivated by strategic impression management. Whereas accounts consistent with motivated reasoning posit that advisors' public certainty displays will reflect delusional

private beliefs when impression management motives are active, the strategic impression management account posits that impression management motives cause advisors to inflate their public displays of certainty in relation to their private beliefs. Notably, this account and the motivated reasoning account are not mutually exclusive: Impression management motives may cause advisors to delude themselves about the accuracy of their judgment while simultaneously triggering a pattern of strategic exaggeration where they publicly inflate their degree of certainty above and beyond these delusional beliefs. However, unlike explanations involving motivated reasoning, the strategic impression management account explicitly predicts a discrepancy between communicators' public certainty displays and their private judgments when impression management motives are active.

Perhaps the most popular account of certainty displays being motivated by strategic concerns is Yaniv and Foster's (1995, 1997) argument in favor of overprecision being motivated by social norms to provide information that others find informative. That is, if people intuit that others perceive predictions reflecting substantial uncertainty as being uninformative, then they may deliberately convey certainty in their predictions as a means of increasing the extent to which others find them useful. While Yaniv and Foster (1997) find that people value informativeness over accuracy in their communications, they also fail to find evidence that audience considerations influence overprecision. One marker of behavior being motivated by strategic impression management is that publicity should cause one's communicated beliefs to diverge from one's private beliefs (Leary & Kowalski, 1990), so in this sense Yaniv and Foster (1997) do not exactly find evidence of strategic impression management. Relatedly, the degree of overprecision reported in studies tends to be similar irrespective of whether communications

are public or private (Moore et al., 2015). As such, evidence consistent with a strategic impression management account of certainty posturing is largely nonexistent.

Although relatively little work has examined certainty displays that have been crafted for an audience (for an exception, see Radzevick & Moore, 2011), let alone directly test for discrepancies between individuals' private beliefs and public communications, it is possible that researchers have not considered contexts where communicators are actually motivated to engage in impression management. For example, Yaniv and Foster (1997) find a similar degree of overprecision in a study where participants imagine an everyday interaction with a friend as they do in other studies where judgments are private. However, given that such a context may not activate particularly strong impression management motives, perhaps it should come as no surprise that the publicity of a judgment alone does not exacerbate overprecision in this type of context.

Behaviors motivated by impression management arise when they are perceived as instrumental to achieving a valued goal (Bolino, 1999; Leary & Kowalski, 1990). Thus, if strategic impression management motivates certainty posturing, then advisors' tendency to inflate their public certainty displays above and beyond their private beliefs should be influenced by 1) the *value* of achieving impression management goals (i.e., the economic or social rewards for successful impression management) and 2) the situational *instrumentality* of certainty posturing (i.e., the perceived efficacy of using certainty displays as a means to achieving impression management goals).

Expertise-signaling incentives increase the value of certainty posturing. One factor that should increase advisors' motive to engage in certainty posturing is the presence of expertise-signaling incentives. The ability to convey expertise is a valuable social currency in

advice contexts that should motivate advisors to engage in strategic impression management. While advisors' degree of certainty does not always correlate with their decision accuracy (Phillips, 1999), advisees use it as proxy for their level of expertise (Price & Stone, 1994; Sniezek & Buckley, 1995; Sniezek & Van Swol, 2001). Consequently, those who convey the most certainty are the most likely to be hired as advisors (Radzevick & Moore, 2011) and the least likely to have their expertise challenged (Sah et al., 2013). However, it is unclear whether advisors intuit these benefits of certainty displays and act on the intuition by inflating their public displays of certainty in relation to their private beliefs.

Radzevick and Moore (2011) come the closest to finding evidence that expertise-signaling incentives may motivate certainty posturing, as their qualitative results suggest that advisors who self-report concerns about being hired are also the most likely to mention a desire to broadcast high levels of confidence. This suggests that when advisors are motivated by the impression management goal of conveying expertise, they should be most likely to engage in certainty posturing. As such, incentive schemes typical of many advice markets that encourage advisors to signal expertise (such as advice fees) should activate impression management motives and exacerbate certainty posturing. Conversely, the absence of these incentives should reduce the value of impression management and curtail advisors' tendency to inflate their public displays of certainty relative to their private beliefs.

H1: Advisors' publicly broadcasted certainty will exceed the certainty reflected in their private beliefs to a greater extent when they are incentivized to convey expertise.

Advisors' attribution of uncertainty influences the situational instrumentality of certainty posturing. However, even when impression management motives are activated via expertise-signaling incentives, advisors may not always view certainty posturing as instrumental

to achieving their impression management goals. Although certainty displays are frequently rewarded, they may not always be perceived as being strategically useful. For example, an expert black jack player may have expertise at quickly computing the odds of having a winning hand given the dealer's face card, yet still be completely uncertain about whether a club or spade will be drawn next. Unlike uncertainty about how to compute the odds of a winning hand, uncertainty about what card will be drawn next is an unavoidable aspect of playing black jack that no amount of expertise can resolve. Therefore, to the extent that the black jack player is motivated to convey expertise to others, he or she is likely to perceive expressed certainty (or lack thereof) as being directly linked to others' impressions when asked about computing the odds of winning. But when asked to predict the next card drawn, the black jack player may not perceive expressed certainty as having any influence on others' assessment of his or her expertise.

As suggested by this example, certainty posturing should be perceived as more instrumental towards impression management goals in some situations than in others. Thus, individuals' attribution of uncertainty should impact the perceived utility of certainty posturing. Uncertainty can often be attributed to either internal sources like one's ability or expertise, or to external sources like statistical randomness and stochastic processes inherent in many decision contexts (e.g., Fox & Ülkümen, 2011; Kahneman & Tversky, 1982; Tannenbaum, Fox, & Ülkümen, 2016; Ülkümen Fox, & Malle, 2016). Consistent with Kahneman and Tversky (1982), I refer to these forms of uncertainty as internal and external uncertainty, respectively.[1]

[1] While Fox and Ülkümen (2011) use the terms epistemic and aleatory uncertainty in a similar vein, they also make a distinction with respect to whether uncertainty is represented as the likelihood of a single event or an event drawn from a sequence of similar events. Because I am

Unlike external uncertainty, which causes people to focus externally on sources like randomness, internal uncertainty causes people to focus internally on knowledge or expertise that they do not possess (Fox & Ülkümen, 2011). As such, situations involving internal uncertainty are likely to trigger a credibility threat where advisors experience concerns that publicly revealing their uncertainty will be perceived as a signal of inadequate expertise and undermine their credibility. People respond to social threats through compensatory behaviors that improve their image (Apsler, 1975; Baumeister & Jones, 1978; Cialdini & Richardson, 1980; Frey, 1978; Leary & Kowalski, 1990; Schneider, 1969) and the mere anticipation of a threat is sufficient to preemptively engage in such compensatory behaviors (Greenberg, Pyszczynski, & Paisley, 1984; Leary, Barnes, & Griebel, 1986). Furthermore, as people in positions of power due to their privileged information and expertise (Birnbaum & Stenger, 1979; Bonaccio & Dalal, 2006; French & Raven, 1959), advisors may be likely to engage in assertive behaviors like certainty posturing that counteract threats to their competence (see Fast & Chen, 2009; Georgesen & Harris, 2006); indeed, there is evidence that power exacerbates overprecision (Fast, Sivanathan, Mayer, & Galinsky, 2012). Taken together, this suggests that advisors should be particularly likely to employ certainty posturing as a compensatory tactic when faced with credibility threats triggered by internal uncertainty.

In contrast, situations involving external uncertainty are less likely to activate credibility threats. Much like how otherwise anxiety-inducing tasks become less threatening when they are not perceived as diagnostic of ability (e.g., Croizet & Claire, 1998; Davies, Spencer, Quinn, & Gerhardstein, 2002; Kang, Galinsky, Kray, & Shirako, 2015; Kray, Thompson, & Galinsky,

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primarily interested in whether uncertainty causes advisors to focus internally on their expertise, I focus on the distinction between internal and external uncertainty.

2001; Steele & Aronson, 1995), uncertainty that advisors attribute to external causes should not be perceived as diagnostic of inadequate expertise. This suggests that certainty posturing should be perceived as having little instrumental value towards achieving impression management goals in situations involving external uncertainty.

H2: Advisors' publicly broadcasted certainty will exceed the certainty reflected in their private beliefs to a greater extent when uncertainty is attributable to internal, rather than external, sources.

Overview of Experiments

Across a series of experiments, the current research tests for evidence of certainty posturing being motivated by strategic impression management (data and materials for the studies are accessible at https://osf.io/2g9nc/?view_only=f529ecc138184185ae4888345b50b794). First, it examines whether the *value* of strategic impression management promotes certainty posturing. Whereas Experiment 1 considers the role of general expertise-signaling incentives on communicators' judgment, Experiment 2 considers whether fees typical of advice markets cause advisors to exaggerate their public certainty estimates in relation to their private beliefs.

Second, it examines whether the situational *instrumentality* of certainty displays as an impression management tactic motivates certainty posturing by considering whether the source of uncertainty moderates certainty posturing even in the presence of an expertise-signaling incentive. Thus, Experiments 3A and 3B test whether, relative to external uncertainty, internal uncertainty activates credibility threats that motivate certainty posturing.

Experiment 4 expands on these studies by exploring the robustness of public certainty displays as strategic impression management. Using a context involving internal uncertainty, it

tests for whether expertise-signaling incentives continue to cause communicators to exaggerate their public certainty displays even when they have alternative means of conveying expertise at their disposal (i.e., written rationales for their uncertainty).

All experiments consider dyadic interactions where focal participants advantaged by relative expertise or an information asymmetry are tasked with conveying judgments to a target that lacks their expertise or privileged information. Notably, these types of expertise asymmetries are commonly associated with advice markets and apply to most advice contexts (Sah, Loewenstein, & Cain, 2013). This not only allows the current research to assess the certainty displays of advisors and overprecision in their advice, but it also provides an opportunity to explore their impact on advisees (Experiments 2 and 3A).

Further, the experiments consider two different proxies of certainty and overprecision. First, Experiment 1 considers the narrowness of advisors' confidence intervals (e.g., Alpert & Raiffa, 1982). Second, Experiments 2-4 consider certainty displays more typical of advice contexts: The degree of extremity in advisors' estimates of the objective likelihood of a prediction or focal outcome occurring (e.g., Price & Stone, 2004; Sah et al., 2013); that is, the closer advisors' likelihood estimates are to 0% or 100%, the higher their degree of certainty.[2]

[2] Rather than using a full-range response format ranging from 0% to 100% for the probability of a focal event, these experiments use half-range response formats (0% to 50% or 50% to 100%) to avoid confounds with full-range response formats where individuals who convey more certainty necessarily exhibit more variance in their responses than those who convey more uncertainty (provided that their likelihood estimates are centered around the same mean; see Price & Stone,

Experiment 1: Strategic Impression Management in Confidence Intervals

One way of studying certainty displays and overprecision is by examining the narrowness of individuals' confidence intervals for numerical estimates (e.g., Alpert & Raiffa, 1982). Experiment 1 therefore tests whether general expertise-signaling incentives that enhance the *value* of impression management trigger a pattern where communicators' publicly displayed confidence intervals are narrower than the confidence intervals revealed by their private judgments.

Method

Participants. In total, 360 Amazon Mechanical Turk (MTurk) workers completed the experiment (M_{Age} = 32.53 years, SD = 10.60, 39% female).

Procedure. The experiment uses a 2 (expertise incentive: yes or no) X 2 (judgment type: public or private) mixed design with expertise incentive manipulated between-subjects and judgment type manipulated within-subjects. I adapted a weight-guessing task from prior research (Gino & Moore, 2007; Moore & Klein, 2008; Moore, Carter, & Yang, 2015) where participants look at a series of photos and guess the weight of a pictured individual in each one. For the current experiment, participants viewed five full-body photos (in a randomized order) from the materials used by Moore & Klein (2008) and provided 90% confidence intervals for the weights in each photo. To do this, they gave both a "lower bound" and "upper bond" (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 et al., 2015).

2004). This helps insure that the experiments are capturing patterns in strategic certainty displays rather than strategic considerations about broadcasting varied likelihood estimates.

Participants made two rounds of confidence interval judgments for each picture in a randomized order: One set of public judgments that could potentially be evaluated by another MTurk worker with imperfect information to use in judging expertise (described as only having access to face-only versions of each photo) and one set of private judgments that would not be shown to anybody else. Irrespective of the expertise incentive condition to which they were assigned, participants' private judgments had no bearing on their final payment.

Expertise incentive manipulation. Regardless of which incentive condition they were randomly assigned to, all participants were informed that there was a 10% chance of having their public judgments displayed to a future evaluator (described as an MTurk worker completing a separate study; evaluator judgments are not analyzed due to a small sample size). In the expertise incentive condition, participants earned "expertise points" such that the more expertise others perceived them to possess at weight guessing (based on their confidence intervals; evaluation scale: 0 = *not at all skilled at weight guessing* to 100 = *very skilled at weight guessing*), the higher their expected bonus payment (maximum: $10). In the no expertise incentive condition, participants knew potential evaluators would evaluate their public confidence interval estimates to assess expertise, but that these assessments would have no bearing on their final payment.

Measuring certainty and overprecision. In this experiment, the narrowness of the distance between participants' "lower bound" and "upper bound" estimates (in pounds) serves as a proxy of their certainty. As per other researchers studying overprecision using confidence intervals (e.g., Alpert & Raiffa, 1982; Moore et al., 2015), I analyzed participants' "hit rates," or the percentage of the time their 90% confidence intervals contained the correct estimate.

Results

I analyzed participants' confidence interval widths and hit rates using a 2 (incentive) X 2 (publicity) mixed ANOVA. Conditional means and standard deviations are documented in Table 1.

Confidence intervals. The expertise incentive caused participants to provide narrower confidence interval estimates, $F(1, 358) = 8.19$, $p = .004$, $d = .30$, 95% CI = [0.09, 0.51]. However, their private judgments were not much different than their public judgments on the whole, $F(1, 358) = 1.38$, $p = .24$.

More importantly, an expertise incentive X judgment type interaction emerged that is consistent with the strategic impression management account, $F(1, 358) = 6.00$, $p = .015$, $\eta_p^2 = .02$. In the expertise incentive condition, participants' public confidence interval judgments were narrower than their private estimates, $t(181) = 2.02$, $p = .045$, $d = .30$, 95% CI = [0.09, 0.51]. However, in the no expertise incentive condition, their public and private judgments did not differ, $t(177) = 1.49$, $p = .138$.

Overprecision. Advisors exhibited a robust pattern of overprecision, 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 (all ps $< .001$).

An expertise incentive X judgment type interaction emerged on participants' overprecision, $F(1, 358) = 3.97$, $p = .047$, $\eta_p^2 = .01$. As expected, the expertise incentive caused a decrease in the hit rates of participants' public confidence interval judgments, $t(358) = 2.00$, $p = .046$, $d = 0.21$, 95% CI = [0.004, 0.42]. In contrast, the hit rates of participants' private judgments were not impacted by the expertise incentive, $t(358) = 0.61$, $p = .54$.

Discussion

By showing that expertise-signaling incentives that increase the *value* of impression management cause communicators to produce narrower public confidence interval judgments than reflected by their private beliefs, Experiment 1 provides preliminary evidence in support of certainty posturing being motivated by strategic impression management. Further, it documents a consequence of this pattern: Expertise-signaling incentives exacerbated overprecision in communicators' public judgments.

Experiment 2: Advice Fees as a Catalyst of Certainty Posturing

Experiment 2 begins a series of experiments that test the strategic impression management account using a proxy of certainty more commonly used in the literature: The probability of making an accurate estimate (Moore et al., 2015). This paradigm is also particularly well-suited for studying impression management in advice contexts, as advisors typically withhold detailed information such as recommendations, rationales, and confidence intervals until they have first generated a sufficiently favorable impression to be selected as an advisor (Radzevick & Moore, 2011). As such, the certainty that advisors broadcast regarding their ability to make an accurate judgment often plays a critical role in influencing others' impressions of their credibility and expertise (Price & Stone, 2004; Sah et al., 2013). Experiment 2 therefore considers whether advice fees incentivizing advisors to be hired (thus increasing the *value* of impression management) cause their public certainty displays to diverge from their private beliefs.

Additionally, Experiment 2 explores the consequences of advisors' hiring incentives on consumers of advice (advisees) made aware of the presence of these incentives. On the one hand, people exposed to certain advice are more likely to express certainty themselves and hire advisors conveying certainty (Radzevick & Moore, 2011). This suggests that if hiring incentives

inflate advisors' public certainty, then advisees paired with advisors given these incentives should also be more likely to hire these advisors and display inflated certainty in their own judgment. On the other hand, knowledge of advisors' incentives to convey certainty may be perceived as a conflict of interest. Because people discount advisors with conflicts-of-interest that are revealed by an external source when making private judgments (Sah, Loewenstein, & Cain, 2013), this suggests that advisees may discount the certainty displays of advisors with hiring incentives.

Method

Participants. In total, 220 MTurk workers completed the experiment in the advisor role (M_{Age} = 33.09 years, *SD* = 11.01, 39% female). I then recruited an additional 220 MTurk workers to play the advisee role (M_{Age} = 38.19 years, *SD* = 12.09, 48% female).

Procedure. From advisors' perspective, the study follows a 2 (hiring incentive: yes or no) X 2 (judgment type: public or private) mixed design with hiring incentive manipulated between subjects and certainty estimates manipulated within subjects. Advisees were later paired with a random advisor who either had a hiring incentive or did not.

Advisors. Advisors received information about the value of five stocks at the beginning of each month over a twelve-month period (selected at random from the S&P 500 and labeled stocks "A-E" to obscure their identity) and made predictions about their future value. However, they were also informed that they would be paired with an advisee who would only have access to data for the first three months; this placed them in a position of relative expertise because they were advantaged by nine months of more recent data. To provide advisors with an opportunity to build a reputation, I also informed them that advisees would receive feedback about each stock's actual value in Month 13 after they made their own predictions.

For each stock (presented in a random order), advisors made a prediction about the stock's value at the beginning of the next month (Month 13). To do this, they were prompted with a reference value and asked to predict whether the stock's value would fall above or below that value. The reference value was always the mean of that stock's value over the first three months (the only data advisees could access); this was intended to reinforce the information asymmetry between advisors and advisees, as it should be difficult for advisees to make accurate predictions. After making a given prediction, advisors indicated their certainty in the prediction in a message for their advisee ("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"; XX.XX was filled with the stock's reference value).

Once they had made predictions and broadcasted certainty estimates for all five stocks, advisors then proceeded to make judgments about the same five stocks in private that would never be accessed by their advisee. To encourage honest reporting of their degree of certainty, advisors were awarded "accuracy points" determined by a modified Brier score (Brier, 1950).[3] Advisors learned that these points would determine the number of raffle tickets they earned towards a separate drawing for an additional $50 bonus payment; this rewarded high certainty in accurate guesses and more tempered certainty in inaccurate guesses. To help them understand the scoring system, advisors saw a table displaying the number of points they would earn for assigning varying certainty to both accurate and inaccurate estimates.

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[3] I used the following quadratic scoring rule from Selten (1998): $.5*[1 + 2c – (c^2 + i^2)]$, where c is the probability assigned to the correct prediction and *i* is the probability assigned to the incorrect prediction (necessarily equivalent to 1 - *c*). This is equivalent to an inverse Brier (1950) score with a minimum value of 0 and a maximum value of 1.

Hiring incentive manipulation. Advisors were randomly assigned to incentive conditions where they were either incentivized to be hired as often as possible (hiring incentive condition) or not (no hiring incentive condition). Those assigned to the hiring incentive condition earned one raffle ticket for a $50 bonus payment each instance their advisee elected to "hire" them by accessing their prediction for a particular stock. In contrast, advisors in the no hiring incentive condition were also entered into a raffle for a $50 bonus, but the number of times they were hired had no bearing on their likelihood of winning the raffle.

Advisees. Advisees were paired with a randomly selected advisor and provided with information about whether their advisor had a hiring incentive ("your advisor's economic outcomes improve whenever you choose to access his or her predictions") or not ("your predictions, confidence, and choice of whether to access your advisor's predictions will have no bearing on his or her economic outcomes"). Advisees evaluated the same stocks presented to advisors (in a random order), yet like advisors' private estimates, they were incentivized to make accurate assessments (via a Brier score). Aware that they were paired with an advisor with access to nine months' worth of more recent data, advisees made a choice about whether to pay a small fee[4] to access the advisor's prediction after receiving a message indicating the advisor's certainty, but prior to making their own prediction about the stock's value and receiving feedback about the stock's actual value.

Measuring advisor certainty and overprecision. I assessed advisors' certainty and overprecision. To measure the magnitude of advisors' overprecision, I regressed advisors'

[4] The fee was defined as 10% of any accuracy points earned on a given stock. I selected a percentage of earnings as the cost of advice rather than a fixed fee to avoid the possibility of advisees earning negative points.

prediction accuracy on their certainty and retained the residuals (I obtained separate residuals for public and private estimates). This approach results in a measure that represents advisors' residual certainty above and beyond what could have been predicted by their accuracy.[5]

Advisee certainty and hiring decisions. To explore the downstream consequences of hiring incentives on advisors' public judgments, I also examined how they impacted advisees' certainty and hiring decisions.

Results

I analyzed advisors' mean certainty (conditional means in Figure 1) and overprecision across the five stocks they evaluated using a 2 (hiring incentive) X 2 (publicity) mixed ANOVA.

To understand how advisors' hiring incentive and certainty impacted advisees' judgment, I also analyzed advisees' certainty and hiring decisions using hierarchical models nesting advisees' round-by-round decisions within their paired advisor via advisor-specific random intercepts (see Table 2 for model estimates). First, I tested for main effects of the hiring incentive on advisees' certainty and hiring decisions while considering whether any effects could be accounted for by strategic impression management in advisors' certainty displays; to test for mediation, I used Krull and MacKinnon's (2011) multilevel mediation procedure. I then explored

[5] Researchers have recommended this approach for measuring overconfidence in lieu of simple difference scores (i.e., subtracting accuracy from certainty) because difference scores are primarily influenced by the component with higher variance (Edwards, 1994; Kennedy, Anderson, & Moore, 2013). Because overprecision is necessarily confounded with accuracy (Klayman, Soll, González-Vallejo, & Barlas, 1999; Olsson, 2014), difference scores can obscure any effects driven by certainty judgments.

for evidence of moderation to understand whether advisees discounted advisors' certainty displays.

Advisor certainty. Advisors' overall certainty was greater in the hiring incentive condition, $F(1, 218) = 9.00$, $p = .003$, $d = .41$, 95% CI = [0.14, 0.67]. Further, they conveyed more certainty in their public advice than was reflected in their private judgments, $F(1, 218) = 9.17$, $p = .003$, $d = 0.41$, 95% CI = [0.22, 0.60].

More importantly, consistent with Experiment 1, a hiring incentive X judgment type interaction emerged, $F(1, 218) = 27.23$, $p < .001$, $\eta_p^2 = .11$. In the hiring incentive condition, advisors' public communications conveyed more certainty than their private judgments, $F(1, 110) = 26.15$, $p < .001$, $d = 0.98$, 95% CI = [0.70, 1.25]. However, in the no hiring incentive condition, their public communications conveyed marginally *less* certainty than their private judgments, $F(1, 108) = 3.48$, $p = .065$.

Advisor overprecision. Advisors exhibited a robust pattern of overprecision, as the mean certainty of their judgments was 68% in contrast to their prediction accuracy of 59%, $t(219) = 9.88$, $p < .001$; this pattern held across conditions (all ps < .001).

A hiring incentive X judgment type interaction emerged on participants' overprecision, $F(1, 218) = 27.51$, $p < .001$, $\eta_p^2 = .11$. As expected, the hiring incentive exacerbated advisors' overprecision in their public judgments ($M_{\text{Incentive}} = 3.58$, $SD = 11.07$ vs. $M_{\text{No Incentive}} = -3.64$, $SD = 9.61$), $t(218) = 5.16$, $p < .001$, $d = 0.70$, 95% CI = [0.43, 0.97]. In contrast, advisors' overprecision in their private judgments was not impacted by the hiring incentive ($M_{\text{Incentive}} = 0.36$, $SD = 11.87$ vs. $M_{\text{No Incentive}} = -0.37$, $SD = 10.61$) $t(218) = 0.48$, $p = .63$.

Advisee certainty. Advisees assigned to an advisor with a hiring incentive displayed more certainty in their judgments ($M_{\text{Incentive}} = 79.59$, $SD = 11.95$ vs. $M_{\text{No Incentive}} = 75.55$, SD = 13.58), $z = 2.36$, $p = .018$, $\beta = 0.12$, 95% CI = [0.02, 0.23].

An exploratory mediation analysis found evidence that advisees' elevated certainty in the hiring incentive condition could be attributed to the strategic impression management of their advisors. Advisors' certainty predicted advisees' certainty independently of the hiring incentive, $\beta = 0.43$, $z = 16.09$, $p < .001$, while controlling for advisors' certainty eliminated the effect of the hiring incentive on advisees' certainty (from $\beta = 0.12$ to $\beta = 0.01$, $p = .77$). A bootstrap with 1,000 bootstrap replications revealed an indirect effect of advisor certainty, indirect effect = 3.58, 95% CI = [2.91, 4.24], $z = 10.57$, $p < .001$.

Advisors' hiring incentive did not interact with their certainty displays to influence advisees' certainty, $z = 1.42$, $p = .157$. This suggests advisors' certainty displays positively impacted advisees' certainty irrespective of whether they knew of an advisor's hiring incentive.

Advisee hiring decisions. Although the hiring incentive increased advisees' certainty, it did not influence their hiring decisions, $z = 0.84$, $p = .40$. Interestingly, this occurred despite advisors' certainty positively predicting their likelihood of being hired, $z = 8.84$, $p < .001$, OR = 1.10.

Further, advisors' hiring incentive did not interact with their certainty displays to influence advisees' hiring decisions, $z = 0.04$, $p = .97$. This suggests that although advisees did not necessarily hire advisors in the hiring incentive condition more frequently, it was not necessarily because they discounted the certainty displays of advisors with a hiring incentive.

Discussion

By demonstrating that hiring incentives—a type of expertise-signaling incentive that increases the value of impression management—cause advisors to inflate their public certainty displays in relation to their private beliefs, Experiment 2 conceptually replicates Experiment 1 while providing further evidence consistent with certainty posturing being motivated by strategic impression management. Similar to Experiment 1, hiring incentives also exacerbated overprecision in advisors' public displays of certainty, but not in their private beliefs. Because advisors' private estimates occurred after being informed of their hiring incentive, this suggests that motivated reasoning did not drive their certainty posturing; if anything, expertise-signaling incentives marginally *decreased* advisors' certainty in their private judgments.

Experiment 2 also builds on Experiment 1 by exploring the consequences of expertise-signaling incentives on consumers of advice. Overall, advisors' certainty displays were contagious and positively influenced advisees' certainty irrespective of whether they chose to hire the advisor ($r = .33$, $p < .001$) or not ($r = .49$, $p < .001$). Further, the results suggest that advisees failed to discount the certainty displays of advisors with hiring incentives when making their own certainty judgments and deciding whether to hire an advisor. As a consequence, advisees assigned to advisors with hiring incentives exhibited more certainty in their judgments. However, these results should be interpreted with caution. Although consistent with evidence that consumers of advice fail to adequately discount advice they know to be potentially biased (Cain, Loewenstein, & Moore, 2005, 2011), it could be possible that they did not necessarily intuit that a hiring incentive would motivate advisors to provide overprecise advice. In contrast, had advisors' motive to convey certainty been explicitly mentioned, perhaps advisees would have discounted the advice of advisors with hiring incentives (e.g., Sah et al., 2013).

But if advisees did not discount the certainty displays of advisors with hiring incentives, then why was there no evidence of the hiring incentive impacting their hiring decisions? One possibility for this could be that although advisors' certainty positively predicted hiring decisions, the current study's sample size did not provide enough statistical power to detect an effect of hiring incentive on hiring likelihood (cf. Rucker, Preacher, Tormala, & Petty, 2011). As advisees were directionally more likely to hire advisors with hiring incentives, I ran an exploratory analysis to consider the possibility that this effect was influenced by an indirect effect of advisor certainty. To do this, I regressed the proportion of the time a given advisee elected to hire his or her advisor on the hiring incentive manipulation and compared this effect to the magnitude of the effect when controlling for advisors' certainty. When controlling for advisors' certainty, the non-significant effect of advisor incentive reduced in magnitude (from $\beta = .05$ to $\beta = .01$) and this decrease could be partially accounted for by an indirect effect of advisor certainty, indirect effect = 0.03, 95% CI = [0.001, 0.06]. Though it is debatable whether this implies mediation in the absence of a significant direct effect, it nonetheless suggests that more statistical power was needed to detect an effect where advisors with hiring incentives were hired more frequently.

Experiment 3: Certainty Posturing Under Internal Uncertainty

Experiments 1 and 2 provide evidence consistent with the strategic impression management account by showing that communicators are more likely to engage in certainty posturing when expertise-signaling incentives add economic *value* to engaging in impression management (Hypothesis 1). Experiment 3 provides an additional test of whether certainty posturing is motivated by strategic impression management by considering whether it is more prevalent when people perceive it as *instrumental* to achieving impression management goals.

Specifically, it examines whether advisors are more likely to engage in certainty posturing under internal uncertainty than under external uncertainty (Hypothesis 2).

However, if people perceive certainty posturing as instrumental to achieving impression management goals under internal uncertainty, then they should also perceive a stronger link between their degree of certainty and others' perception of their credibility. This perception should motivate them to engage in certainty posturing as an impression management tactic to restore their credibility. In order to investigate this link, I begin with a series of pretests (Pretests 1-3) examining whether internal uncertainty activates credibility threats that cause people to perceive uncertainty as being likely to undermine their credibility.

I then test for a behavioral pattern where advisors act on credibility threats under internal uncertainty by engaging in certainty posturing. Whereas Experiment 3A directly tests whether people are more likely to engage in certainty posturing under internal uncertainty, Experiment 3B more directly considers whether inflated certainty in advice is linked to credibility threats activated by internal uncertainty.

Pretest 1: Uncertainty Attributable to Inadequate Knowledge

I begin with a pretest examining whether internal uncertainty attributable to inadequate knowledge activates a greater credibility threat than external uncertainty attributable to situational unpredictability.

Method. I collected data from 102 MTurk workers (M_{Age} = 32.53, SD = 10.60, 39% female; those who failed a comprehension check were rejected before viewing dependent measures), who read three vignettes in a randomized order. They took the perspective of a financial advisor uncertain about which of two investment opportunities to pursue, a consultant uncertain about whether online or television-based advertising will be more effective for a

company's marketing campaign, and a lawyer uncertain about an artist's chances of winning a potential lawsuit for copyright infringement (see Appendix for full scenarios). Participants were randomly assigned to read scenarios where uncertainty could either be attributed to their state of knowledge (internal uncertainty) or situational unpredictability (external uncertainty).

After reading each vignette, participants completed two manipulation check items assessing the extent to which they attributed uncertainty to internal causes ("I am uncertain because I do not possess enough expertise about this particular situation") and external causes ("I am uncertain because of unpredictable events beyond my control"). They also indicated the extent to which they experienced a credibility threat ("If I reveal my belief that there is a 50% chance of Investment B earning a better return than Investment A, my client will…") using a two-item measure ($\alpha = .87$; "think I am incompetent," "wonder whether my advice is credible"). Participants responded on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Results. Participants in the internal uncertainty condition attributed their uncertainty more to internal sources than participants in the external uncertainty condition ($M_{\text{Internal}} = 5.33$, $SD = 1.13$ vs. $M_{\text{External}} = 2.86$, $SD = 1.44$), $t(100) = 10.51$, $p < .001$, $d = 2.11$, 95% CI = [1.62, 2.59]. Further, participants in the external uncertainty condition attributed their uncertainty more to external sources than participants in the internal uncertainty condition ($M_{\text{External}} = 5.51$, $SD = 1.02$ vs. $M_{\text{Internal}} = 4.06$, $SD = 1.43$), $t(100) = 5.82$, $d = 1.17$, 95% CI = [0.74, 1.59].

More critically, internal uncertainty (M = 3.55, SD = 1.50) activated a greater credibility threat than external uncertainty (M = 4.44, SD = 1.27), $t(100) = 3.26$, $p = .002$, $d = 0.65$, 95% CI = [0.25, 1.05].[6]

Pretest 2: Uncertainty About a Future Event

Because future events are inherently more predictable than potentially knowable past events, people associate them with internal uncertainty (Moore, Carter, & Yang, 2015; Tannenbaum et al., 2016). In Pretest 2, I considered whether this predicts patterns in perceived credibility threats.

Method. I collected data from 201 MTurk workers (M_{Age} = 36.66, SD = 12.59, 42% female; those who failed a comprehension check were rejected before viewing dependent measures), who read an adapted version of the financial advisor vignette from Pretest 1. They were randomly assigned to read a version where their client either asked about a knowable past event ("Which of the two investments earned a better return last quarter?") or an unpredictable future event ("Which of the two investments do you think will earn a better return next quarter?"). After reading the vignette, they completed the same manipulation checks and credibility threat measure (α = .77) as participants in Pretest 1.

Results. Participants in the past event condition attributed their uncertainty more to internal sources than participants in the future event condition (M_{Past} = 5.14, SD = 1.66 vs. M_{Future} = 4.58, SD = 1.69), $t(199) = 2.35$, $p = .02$, $d = 0.33$, 95% CI = [0.05, 0.61]. Further, participants in the future event condition attributed their uncertainty more to external sources than

[6] To assess whether the effect varied across scenarios, I conducted a preliminary analysis using a 3 (Scenario) X 2 (Domain Knowledge) mixed ANOVA. The interaction term was not significant, $F(1, 100) = 0.10$, $p = .92$, suggesting that the effect size is similar across scenarios.

participants in the past event condition (M_{Future} = 5.19, SD = 1.53 vs. M_{Past} = 3.30, SD = 1.78), $t(199) = 8.05$, $p < .001$, $d = 1.14$, 95% CI = [0.84, 1.44].

More critically, uncertainty about the past event (M = 5.36, SD = 1.24) activated a greater credibility threat than uncertainty about the future event (M = 4.96, SD = 1.26), $t(199) = 2.26$, $p = .025$, $d = 0.32$, 95% CI = [0.04, 0.60].

Pretest 3: Internal Linguistic Frames

Pretest 3 considered whether linguistically framing uncertainty about the same future event in a manner consistent with internal uncertainty (rather than external uncertainty) activates a credibility threat and is perceived as undermining one's ability to be hired as an advisor. Further, it expands on the prior pretests by considering whether people perceive certainty posturing as instrumental towards impression management goals under internal uncertainty. If people believe that certainty displays mitigate credibility threats activated by internal uncertainty, then any relative credibility threat they experience under internal uncertainty should be mitigated when they are highly certain.

Generating linguistic frames. First, I generated statements that participants would associate with internal or external uncertainty. Whereas people tend to use first-person references about the accuracy of their judgment when conveying internal uncertainty, they are more likely to use statements that focus on external events when conveying external uncertainty (Ülkümen et al., 2016). Because people use linguistic markers to make attributions of uncertainty (Fox & Ülkümen, 2011; Ülkümen et al., 2016), I reasoned that they should be more likely to associate a statement referring to the accuracy of their judgment with internal uncertainty than a statement referring to a focal event's likelihood.

To confirm this is the case, I presented 112 MTurk workers with the financial advisor vignette from Pretests 1 and 2. Using a similar methodology to Ülkümen et al. (2016), I asked participants to match probability statements linguistically framed in a manner consistent with either internal or external uncertainty (internal frame: "there is a 50% chance that I can accurately determine whether Investment B will earn a better return than Investment A"; external frame: "there is a 50%"there is a 50% chance that Investment B will earn a better return than Investment A") to rationales consistent with either internal or external uncertainty (internal rationale: "you do not have sufficient expertise, knowledge, or information about the two investments"; external rationale: "the random nature of the market makes the two investments unpredictable"), with no constraint on their ability to match a given rationale with both probability statements.

As expected, participants were more likely to match the internally framed statement with the rationale involving internal uncertainty (76%, $p < .001$). They were also more likely to match the externally framed statement with the rationale involving external uncertainty (79%, $p < .001$). Taken together, this confirms that when presented with a situation where the source of their source of uncertainty would otherwise be ambiguous, they attributed the internally framed statement to internal uncertainty and the externally framed statement to external uncertainty.

Method. Pretest 3 followed a 2 (linguistic frame: internal or external) X 2 (certainty: uncertain or certain) mixed design. After confirming that participants attributed internal and external statements to their intended source of uncertainty, I recruited 100 MTurk workers (M_{Age} = 32.43, SD = 10.31, 32% female; those who failed a comprehension check were rejected before viewing dependent measures) to read an adapted version of the financial advice vignette from Pretests 1 and 2 containing one of the linguistic frames generated above. They were randomly

assigned to receive information about their degree of certainty in a manner linguistically framed either internally or externally twice (randomized order): once when they were uncertain ("50% chance") and once when they were certain ("100% chance"). After reading each statement about their degree of certainty, participants indicated the extent to which they perceived a credibility threat using the same measure as Pretests 1 and 2 (α = .70). They also assessed their likelihood of being hired by their client using a two-item measure (α = .82; "my client will not hire me again in the future," "my client will seek the advice of my competitors in the future").

Results. As expected, a linguistic frame X certainty interaction emerged on perceived credibility threat, $F(1, 98) = 16.28$, $p < .001$, $\eta_p^2 = .14$, and hiring likelihood, $F(1, 98) = 17.72$, $p < .001$, $\eta_p^2 = .15$. Consistent with Pretests 1 and 2, relative to the external uncertainty frame condition ($M = 3.58$, $SD = 1.46$), participants perceived a greater credibility threat under uncertainty when exposed to the internal frame consistent with internal uncertainty ($M = 4.87$, $SD = 1.42$), $t(98) = 4.48$, $p < .001$, $d = 0.90$, 95% CI = [0.49, 1.32]. They also believed that they would be less likely to be hired in the internal uncertainty frame condition ($M = 2.97$, $SD = 1.20$) than in the external uncertainty frame condition ($M = 4.68$, $SD = 1.43$), $t(98) = 6.48$, $p < .001$, $d = 1.31$, 95% CI = [0.88, 1.74].

In contrast, when participants were certain, those in the internal frame condition perceived a similar credibility threat to those in the external frame condition ($M_{\text{Internal}} = 3.43$, $SD = 1.50$ vs. $M_{\text{External}} = 3.23$, $SD = 1.43$), $t(98) = 0.68$, $p = .50$. A follow-up analysis of the internal frame conditions revealed that, consistent with the notion that people perceive certainty displays as particularly instrumental to impression management under internal uncertainty, certainty alleviated the credibility threat they perceived under uncertainty, $F(1, 49) = 29.48$, $p < .001$, $d = 0.61$, 95% CI = [0.05, 1.18]. However, a comparison of the external frame conditions failed to

find evidence that certainty alleviated the credibility threat they perceived under uncertainty, $F(1, 49) = 0.50$, $p = .48$. Similarly, participants did not perceive a difference in hiring likelihood between the internal and external frame conditions when they were certain, $t(98) = 0.33$, $p = .74$.

Consistent with the credibility threat variable, participants in the internal frame condition felt that certainty increased their hiring likelihood, $F(1, 49) = 42.53$, $p < .001$, $d = 1.31$, 95% CI = [0.88, 1.74]. Further, although participants in the external frame condition still perceived their hiring likelihood as being marginally lower under uncertainty, $F(1, 49) = 3.12$, $p = .083$, the difference was minor in comparison to the internal uncertainty condition. Taken together, these findings suggest that participants believed that certainty would be instrumental to achieving their impression management goals under internal uncertainty, but not under external uncertainty.

Experiment 3A: Internal Frames Facilitate Certainty Posturing

Experiment 3A tests whether internal linguistic frames, which activate credibility threats under uncertainty that can be alleviated by certainty displays, promote certainty posturing. It also explores whether advisees intuit advisors' impression management motives and discount their certainty displays under internal uncertainty.

Method

Participants. In total, 362 MTurk workers played the advisor role ($M_{Age} = 34.02$, $SD = 11.16$, 40% female). I later recruited 362 MTurk workers to play the advisee role ($M_{Age} = 35.25$, $SD = 11.61$, 42% female; advisors excluded from participant pool).

Procedure. From advisors' perspective, the study follows a 2 (linguistic frame: yes or no) X 2 (judgment type: public or private) mixed design with linguistic frame manipulated between subjects and certainty estimates manipulated within subjects. Advisees were later paired with a random advisor who sent messages adopting either an internal or external frame.

Advisors. Advisors followed the same procedure as participants in the hiring incentive condition of Experiment 2. However, they were randomly assigned to convey messages that were either linguistically framed in a manner consistent with internal uncertainty ("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") or external uncertainty ("There is a ___% chance that the stock's value will fall be ____ $XX.XX at the start of Month 13"; the second blank was not prefilled so that advisors knew their message would not reveal their actual prediction unless their advisee elects to pay an advice fee). Advisors' private judgments also adopted a linguistic frame consistent with their publicized messages.

Advisees. Advisees were notified of their advisors' hiring incentive and paired with a randomly selected advisor whose messages were linguistically framed internally or externally. Other than this modification, their procedure was identical to advisees in Experiment 2.

Dependent measures. Using the same measures as Experiment 2, I assessed advisors' certainty and overprecision, in addition to advisees' certainty and hiring decisions.

Results

As in Experiment 2, I analyzed advisors' mean certainty (conditional means in Figure 2) and overprecision across the five stocks they evaluated using a 2 (linguistic frame) X 2 (publicity) mixed ANOVA. I also used the same hierarchical models as Experiment 1 to explore advisees' certainty and hiring decisions, as well as to conduct mediation analyses (see Table 3 for model estimates).

Advisor certainty. Advisors' overall certainty was greater in the internal frame condition, $F(1, 360) = 10.91$, $p = .001$, $d = 0.35$, 95% CI = [0.14, 0.56]. Further, they conveyed

more certainty in their public advice than was reflected in their private judgments, $F(1, 360) = 20.59$, $p < .001$, $d = 0.48$, 95% CI = [0.27, 0.69].

More importantly, consistent with Hypothesis 2, a linguistic frame X judgment type interaction emerged, $F(1, 360) = 7.57$, $p = .006$, $\eta_p^2 = .02$. In the internal frame condition, advisors' public communications conveyed more certainty than their private judgments, $F(1, 180) = 20.50$, $p < .001$, $d = 0.68$, 95% CI = [0.46, 0.89]. However, in the external frame condition, their public communications conveyed a similar level of certainty as their private judgments, $F(1, 180) = 2.27$, $p = .134$.

Advisor overprecision. Advisors again exhibited a robust pattern of overprecision, as the mean certainty of their judgments was 76% in contrast to their prediction accuracy of 54%, $t(361) = 19.11$, $p < .001$; this pattern held across conditions (all ps $< .001$).

A linguistic frame X forecast type interaction emerged on participants' overprecision, $F(1, 360) = 8.29$, $p = .004$, $\eta_p^2 = .02$. As expected, the internal frame exacerbated advisors' overprecision in their public judgments ($M_{\text{Internal}} = 2.30$, $SD = 10.52$ vs. $M_{\text{External}} = -2.30$, $SD = 9.40$), $t(360) = 4.40$, $p < .001$, $d = 0.46$, 95% CI = [0.25, 0.67]. In contrast, advisors' overprecision in their private judgments was not impacted by linguistic frame ($M_{\text{Internal}} = 0.78$, $SD = 10.84$ vs. $M_{\text{External}} = -0.78$, $SD = 10.73$) $t(360) = 1.38$, $p = .168$.

Advisee certainty. Advisees assigned to an advisor who sent messages with an internal frame displayed more certainty in their judgments ($M_{\text{Internal}} = 81.33$, $SD = 13.28$ vs. $M_{\text{External}} = 78.39$, SD = 11.95), $z = 2.22$, $p = .026$, $\beta = 0.09$, 95% CI = [0.01, 0.17].

An exploratory mediation analysis found evidence that advisees' elevated certainty in the internal frame condition could be attributed to the strategic impression management of their advisors. Advisors' certainty positively predicted advisees' certainty independently of linguistic

frame, β = 0.36, z = 17.54, p < .001, while controlling for advisors' certainty eliminated the effect of linguistic frame on advisees' certainty (β = 0.03, p = .43). A bootstrap with 1,000 replications revealed an indirect effect of advisor certainty, indirect effect = 1.93, 95% CI = [1.49, 2.40], z = 8.49, p < .001.

Advisors' linguistic frame did not interact with their certainty displays to influence advisees' certainty, z = 0.30, p = .76. This suggests advisors' certainty displays positively impacted advisees' certainty irrespective of linguistic frame.

Advisee hiring decisions. Although the internal frame increased advisees' certainty, it did not influence their hiring decisions, z = 1.01, p = .31. Interestingly, this occurred despite advisors' certainty positively predicting their likelihood of being hired, z = 9.86, p = .004, OR = 1.07.

A linguistic frame X estimate type interaction emerged that elucidates why advisors in the internal frame condition were no more likely to be hired despite their greater certainty, z = 3.88, p < .001, OR = 1.05 (see Figure 3). Although advisors' certainty positively predicted hiring likelihood in both conditions, the effect was more pronounced in the internal frame condition, B = 0.09 (SE = 0.01), z = 8.53, p < .001, OR = 1.10, than in the external frame condition, B = 0.04 (SE = 0.01), z = 5.13, p < .001, OR = 1.04. In other words, the impression management benefits of inflated certainty displays in the internal frame condition were overridden by a relative penalty for failing to convey high degrees of certainty. Thus, advisees did not discount advisors' inflated certainty displays in the internal frame condition. Instead, they penalized advisors who conveyed high degrees of internal uncertainty when making hiring decisions.

Discussion

Experiment 3A builds on Pretests 1-3 by providing behavioral evidence that advisors are more likely to engage in certainty posturing under internal uncertainty (Hypothesis 2). Specifically, they were more likely to engage in certainty posturing in the internal frame condition where conveying uncertainty would mean doing so in a manner consistent with internal uncertainty. This occurred even though they faced the same objective situation as advisors in the external frame condition. Notably, the procedure for advisors in the internal frame condition was identical to advisors in the hiring incentive condition of Experiment 2. This indicates that even when advisors were provided with an expertise-signaling incentive that motivates them to engage in certainty posturing, they no longer employed the tactic when uncertainty was reframed in a manner consistent with external uncertainty.

Collectively, Experiment 3A and Pretest 3 provide additional evidence consistent with certainty posturing being motivated by strategic impression management. Because people believe certainty has the potential to enhance their credibility relative to internal uncertainty, but not in relation to external uncertainty (Pretest 3), advisors' pattern of certainty posturing in Experiment 3A suggests that they engage in certainty posturing in precisely the situations where it is *instrumental* to conveying expertise. This resulted in a pattern where internal uncertainty exacerbated overprecision in advisors' public advice. In contrast, their private judgments were unaffected by the source of uncertainty. As with Experiment 2, this does not lend support to certainty posturing being driven by motivated reasoning processes.

Similarly to Experiment 2, advisees in Experiment 3A did not appear to intuit advisors' impression management motives. Once again, advisors' certainty displays were contagious and positively influenced advisees' certainty irrespective of whether they chose to hire the advisor ($r = .20$, $p < .001$) or not ($r = .46$, $p < .001$). Because advisees failed to discount the inflated

certainty of advisors adopting an internal frame, their certainty was inflated in relation to advisees paired with advisors who adopted an external frame. Furthermore, their hiring decisions confirmed that advisors have good reason to engage in certainty posturing under internal uncertainty: Advisees were particularly unlikely to hire advisors who failed to convey high degrees of certainty in the internal frame condition. Taken together with evidence that people are particularly prone to discounting advisors who express uncertainty in a manner consistent with internal uncertainty (e.g., "I am not sure"; Gaerting & Simmons, in press), this suggests that advisors made valid inferences about the impression management costs of conveying internal uncertainty.

Experiment 3B

Although Experiment 3A provides evidence of a behavioral pattern consistent with certainty posturing being motivated by strategic impression management, it is unclear whether advisors' inflated certainty in advice under internal uncertainty can necessarily be attributed to credibility threats. To confirm this is the case, Experiment 3B examines whether credibility threats activated by internal uncertainty mediate advisors' tendency to inflate their public advice when presented with internal linguistic frames.

Method

Participants. In total, 217 MTurk workers played the advisor role (M_{Age} = 36.58, *SD* = 11.88, 43% female). I did not recruit a new sample of advisees for this study.

Procedure. Advisors replicated the procedure of Experiment 3A for the first half of the experiment. However, rather than assessing advisors' estimates in private after completing their public estimates, I instead assessed the extent to which they experienced a credibility threat. Because I did not recruit a new sample of advisees for this study, advisors' payoffs were

simulated by pairing them with an advisee from Experiment 3A who received similar certainty estimates from an advisor in the same linguistic frame condition.

Dependent measures. I assessed advisors' certainty and overprecision using the same measure as Experiments 2 and 3A. To assess the extent to which advisors experienced a credibility threat, I used a three-item index assessing the extent to which failing to convey certainty would cause their advisee to think they are incompetent, wonder whether their estimates are credible, and not seek their advice ($\alpha = .87$).

Results

Advisor certainty. Consistent with the strategic impression management account, advisors' certainty was inflated in the internal frame condition ($M = 80.36$, $SD = 11.18$) relative to the external frame condition ($M = 76.40$, $SD = 11.07$), $t(215) = 2.62$, $p = .009$, $d = 0.36$, 95% CI = [0.09, 0.63].

Advisor overprecision. As in Experiment 3A, advisors exhibited a robust pattern of overprecision. Whereas the mean certainty of their judgments was 78%, their prediction accuracy was only 58%, $t(216) = 11.42$, $p < .001$; this pattern held in both linguistic frame conditions (both ps $< .001$).

Once again, the internal frame exacerbated advisors' overprecision in their public judgments ($M_{\text{Internal}} = 2.05$, $SD = 11.18$ vs. $M_{\text{External}} = -2.00$, $SD = 10.87$), $t(215) = 2.70$, $p = .007$, $d = 0.37$, 95% CI = [0.10, 0.64].

Credibility threat. Consistent with Pretest 3, the internal linguistic frame ($M_{\text{Internal}} = 4.80$, $SD = 1.57$ vs. $M_{\text{External}} = 4.15$, $SD = 1.51$) activated a greater credibility threat than the external frame, $t(215) = 3.11$, $p = .002$, $d = .43$, 95% CI = [0.16, 0.69].

Mediation. As expected, consistent with the strategic impression management account, a mediation pattern emerged suggesting that advisors' inflated advice certainty in the internal frame condition was motivated by a perceived credibility threat. Advisors' experienced credibility threat positively predicted their certainty independently of linguistic frame, $\beta = 0.24$, $t(214) = 3.51$, $p < .001$, while controlling for credibility threat reduced the effect of linguistic frame on advisors' certainty (from $\beta = 0.18$, $p = .009$, to $\beta = 0.12$, $p = .073$). A bootstrap with 1,000 replications revealed an indirect effect of credibility threat, indirect effect = 1.31, 95% CI = [0.34, 2.74], $z = 2.46$, $p = .013$.

Discussion

Experiment 3B replicates the pattern in Experiment 3A where internal linguistic frames caused advisors to inflate their advice certainty and exhibit more overprecision in advice than external frames. However, it also provides more direct support for certainty posturing being motivated by strategic impression management, as advisors' inflated certainty in advice appeared to be motivated by concerns about uncertainty undermining their credibility.

Experiment 4: Exploring the Robustness of Certainty Posturing

Taken together, Experiments 1-3 provide evidence that expertise-signaling incentives and credibility threats activated by internal uncertainty motivate advisors to inflate their public certainty displays, but do not influence their private beliefs. This results in a pattern where these factors exacerbate overprecision in advice. However, a limitation of these experiments is that they did not allow advisors an opportunity to explain the reasoning behind their certainty (or lack thereof). Although this is often a feature of advice contexts where advisees must pay for advisors' time (Radzevick & Moore, 2011), it raises the possibility that communicators may not rely on certainty posturing as an impression management tactic when they have the opportunity

to rationalize their uncertainty. Experiment 4 therefore considers whether expertise-signaling incentives continue to encourage communicators to exaggerate their public displays of certainty in a context involving internal uncertainty (emotion-recognition accuracy) when they can also reveal their predictions and explain the reasoning behind their uncertainty.

Experiment 4 also considers the possibility that advisors' probabilistic estimates in Experiments 2 and 3 are not motivated by considerations about conveying certainty per se, but rather by a motive to overstate the likelihood of all events more generally. Because Experiments 2 and 3 only use a half-range response format (50% to 100% probability) rather than a full-range response format (0% to 100% probability), a strategy of conveying certainty cannot be disentangled from a strategy of overstating event likelihoods (see Brenner, Griffin, & Koehler, 2005). If advisors' probabilistic estimates were driven by an impression management tactic of overstating event likelihoods rather than conveying certainty, then one would expect that expertise-signaling incentives should also cause them to overstate their probabilistic estimates when they are instead prompted to estimate the likelihood of their judgment being *in*accurate. However, if they were employing a tactic of exaggerating their degree of certainty, then the response scale should not reverse the effect of expertise-signaling incentives on advisors' probabilistic estimates. Instead, expertise-signaling incentives should cause communicators to make similarly extreme probabilistic estimates (i.e., closer to 100% for accuracy judgments and closer to 0% for *in*accuracy judgments) irrespective of their response scale.

Method

Participants. I recruited 217 MTurk workers to complete an emotion-recognition task (M_{Age} = 35.07, *SD* = 11.50, 50% female).

Procedure. The study follows a 2 (incentive: expertise or accuracy) X 2 (response scale: accuracy or inaccuracy) between-subjects design. Participants completed an emotion-recognition task where they must accurately estimate individuals' posed emotions (DANVA2-AF; Nowicki & Carton, 1993). At the start of the experiment, participants read that in addition to guessing the emotion being displayed in each picture, they would 1) indicate their confidence in their guess, and 2) provide a rationale for their guess and confidence level. Furthermore, I informed them that at the conclusion of the experiment, a random subset of participants (10%) would have their responses evaluated by a future participant (described as an MTurk worker completing a separate study; evaluator judgments are not analyzed due to a small sample size) who would only have access to photos showing actors' eyes (rather than their entire face). Based on this information, evaluators would estimate their degree of expertise on the basis of their guesses, confidence, and rationale. In other words, all participants knew there was a chance that someone with imperfect information would see their responses and use them to evaluate their expertise.

Participants proceeded to complete the emotion recognition task, where they evaluated four pictures selected at random from a set of twelve. For each picture, they were given a choice between two emotions: the correct choice and the emotion most commonly mistaken for the correct choice.[7] After guessing what emotion was being displayed in each picture, participants proceeded to indicate their confidence in their guess, in addition to providing a written rationale for their guess and confidence level.

Expertise incentive manipulation. Participants were randomly assigned to conditions where they were incentivized to either convey expertise or to make the most accurate judgments

[7] I determined this based on a sample of 464 research participants who completed the actual DANVA2-AF for an unrelated study, as it requires participants to choose between four emotions.

possible. Irrespective of condition, participants had a 10% chance of earning a bonus payment and of having their responses shown to an expertise evaluator. In the expertise incentive condition, participants earned "expertise points" based on "how knowledgeable" their evaluator perceived them to be at "reading others' emotions" (0 = *not at all knowledgeable* to 100 = *extremely knowledgeable*). In the accuracy incentive condition, participants instead earned "accuracy points" using the same method used to elicit advisors' private estimates in Experiments 2 and 3. In both conditions, the proportion of advisors' points relative to the maximum possible points dictated their expected bonus payment (maximum: $10).

Response scale manipulation. Participants were also randomly assigned to estimate their accuracy or *in*accuracy. In the accuracy estimate condition, they filled in the blank of the statement "there is a ___% chance that my assessment is accurate" by selecting a percentage on a sliding scale ranging from 50% to 100%. In the inaccuracy estimate condition, participants filled in the blank of the statement "there is a ___% chance that my assessment is inaccurate" by selecting a percentage on a sliding scale ranging from 0% to 50%. Both scales were anchored at 50%.

Dependent measures. I analyzed participants' certainty and overprecision using the same measures as Experiments 2 and 3. To equate response scales across conditions, I transformed the probability estimates of participants in the inaccuracy estimate condition by subtracting their estimate from 100 (thus representing a measure of certainty equivalent to responses in the accuracy estimate condition).

In addition, participants' written rationales were coded for exploratory analyses. To do this, two independent coders blind to experimental condition counted the number of times a given speaker's rationales contained verbal expressions of certainty ($\alpha = .86$) and uncertainty (α

= .94). I then averaged the coders' counts for both types of verbal expressions and divided by the total word count of participants' rationales to generate estimates of the proportion of a speaker's words that contained expressions of certainty (M = 0.02, SD = 0.03) or uncertainty (M = 0.05, SD = 0.05).[8] Because the two measures do not correlate highly with one another (r = .13), I analyze them separately.

Results

I analyzed participants' certainty, overprecision, and written rationales using a 2 (incentive) X 2 (response scale) ANOVA. All effects reported below at $p < .05$ hold when controlling for the pictures participants viewed (all ps < .039).

Certainty. There was no effect of response scale on certainty, $F(1, 213) = 0.22$, $p = .64$. Participants' certainty was similar in both the accuracy (M = 86.08, SD = 9.40) and inaccuracy conditions (M = 86.71, SD = 11.99).

More importantly, as expected, the expertise incentive caused advisors to convey more certainty, $F(1, 213) = 4.48$, $p = .035$, $d = 0.29$, 95% CI = [0.02, 0.56]. In comparison to the accuracy incentive condition (M = 84.81, SD = 12.05), participants conveyed more certainty in the expertise incentive condition (M = 87.88, SD = 9.17).

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[8] Standardizing by word count in this manner separates effects driven by certainty and uncertainty expressions per se from effects driven by participants' motivation to provide detailed rationales. Six participants opted to not provide written rationales, so are omitted from analyses of coded measures; all effects reported at $p < .05$ remain at $p < .05$ when conducting alternative analyses that substitute missing values for these participants with a value of 0.

There was no incentive X response scale interaction, $F(1, 213) = 0.06$, $p = .80$. Critically, this indicates that participants' tendency to convey more certainty when provided with an expertise incentive was not attenuated or reversed when they were estimating their *in*accuracy.

Overprecision. Participants once again exhibited a robust pattern of overprecision, as the mean certainty of their judgments was 86% in contrast to their prediction accuracy of 74%, $t(216) = 7.47$, $p < .001$; this pattern held across conditions (all ps $< .007$).

Particpants' response scale did not influence their overprecision ($M_{\text{Accuracy}} = -0.40$, $SD = 9.35$ vs. $M_{\text{Inaccuracy}} = 0.41$, $SD = 11.90$), $F(1, 213) = 0.36$, $p = .55$.

However, consistent with the strategic impression management account, the expertise incentive exacerbated participants' overprecision ($M_{\text{Expertise}} = 1.51$, $SD = 9.06$ vs. $M_{\text{Accuracy}} = -1.61$, $SD = 12.00$), $F(1, 213) = 4.72$, $p = .031$. There was no incentive X response scale interaction, $F(1, 213) = 0.08$, $p = .78$.

Exploratory analysis: Coded rationales. Although the incentive manipulation did not impact participants' verbal expressions of certainty, $F(1, 207) = 2.21$, $p = .139$, they curtailed their statements of uncertainty in the expertise incentive condition ($M_{\text{Expertise}} = 0.06$, $SD = 0.06$ vs. $M_{\text{Accuracy}} = 0.04$, $SD = 0.03$), $F(1, 207) = 4.21$, $p = .041$, $d = 0.28$, 95% CI = [0.01, 0.55]. Neither the response scale, nor its interaction with incentive, had much influence on participants' expressions of certainty or uncertainty (all ps $> .099$).

Discussion

Using a context involving internal uncertainty, Experiment 4 provides evidence that even when communicators can provide rationales for any uncertainty they might convey, expertise-signaling incentives continue to motivate them to engage in certainty posturing. In so doing,

Experiment 4 provides more robust evidence in support of certainty posturing being employed as a strategic impression management tactic.

Though not hypothesized, an analysis of participants' coded rationales revealed that their verbal expressions of certainty did not necessarily go hand-in-hand with the certainty evident in their numerical probability estimates. In fact, there was no correlation between their numeric certainty estimates and their verbal certainty statements, $r(209) = -.04$, $p = .55$. Rather than increasing their verbal certainty displays, the expertise incentive seemed to decrease their tendency to verbally convey uncertainty.

Is this evidence that participants adopted a strategic impression management strategy of conveying certainty in probabilistic estimates while simultaneously avoiding verbal statements of uncertainty? This does not seem to be the case, as evidenced a negative correlation between participants' numeric certainty and their verbal statements of uncertainty, $r(211) = -.17$, $p = .014$. Instead, it suggests that the typical participant may have adopted one approach or the other, but typically not both at the same time. Further, the conclusion that the expertise incentive did not increase the prevalence of verbal certainty statements should be interpreted with caution. Participants may have actively avoided relying on verbal certainty as an impression management tactic precisely because they viewed their numeric certainty as a viable substitute. It could be possible that in interactions where numeric estimates are atypical, communicators instead rely on verbal certainty displays to convey expertise.

General Discussion

Across a series of experiments, the current research provides evidence of certainty posturing being motivated strategic impression management. In particular, it documents that advisors exaggerate their public displays of certainty (in relation to their private beliefs) to the

extent that a) there is *value* to impression management and b) certainty displays are perceived as *instrumental* to achieving impression management goals.

Experiments 1 and 2 provide evidence that certainty posturing is motivated by the value of impression management. In particular, the experiments show that in the presence of hiring incentives or more general expertise-signaling incentives, advisors will engage in certainty posturing. In contrast, when these incentives are absent, advisors' public certainty displays tend to align with their private beliefs. As a consequence, expertise-signaling incentives exacerbate overprecision in publicly communicated judgments, but do not impact private judgments.

Experiment 3 provides evidence that the situational instrumentality of certainty expression as an impression management tactic influences its use. Across a series of pretests (Pretests 1-3) and two experiments (Experiments 3A and 3B), it provides evidence that internal uncertainty activates a greater credibility threat than external uncertainty, which motivates certainty posturing under internal uncertainty. However, under external uncertainty, advisors' public certainty displays tended to align with their private beliefs—even in the presence of an expertise-signaling incentive. This resulted in a pattern where internal uncertainty exacerbated overprecision in advisors' public communications, but not in their private beliefs.

Finally, Experiment 4 considered the robustness of the strategic impression management account to contexts where communicators have an opportunity to rationalize any uncertainty they may convey in their public judgments. Even when provided with an opportunity to give a written rationale for their uncertainty, communicators continued to inflate their degree of certainty in relation to their private beliefs, thereby exacerbating overprecision.

I also considered the downstream consequences of certainty posturing on advisees' judgment. The goal-relevance of certainty displays and value of impression management not

only exacerbated overprecision in advisors' public advice, but it also biased the judgment of consumers of advice because they did not adequately discount advisors' certainty displays even when provided with information that could allow them to infer advisors' impression management motives (Experiments 2 and 3A). However, it should be noted that although patterns in advisors' certainty displays biased advisees' certainty judgments in predictable ways, these patterns were not necessarily reflected in advisees' hiring decisions. Furthermore, Experiment 3A provides evidence that advisees penalized advisors more harshly for conveying internal uncertainty than for conveying external uncertainty. This lends credence to advisors' presumption that internal uncertainty undermines their credibility and hinders impression management goals.

Theoretical Implications

Taken together, these studies make two primary theoretical contributions. First, they provide causal evidence that people engage in *strategic* overprecision with social motives in mind. While scholars like Yaniv and Foster (1995, 1997) have speculated that this may be the case, prior to this research there has been a surprising lack of evidence to support this argument (Moore et al., 2015). Some scholars like Radzevick and Moore (2011) have alluded to the possibility that situational factors like market competition and learning via feedback about consumer choices can exacerbate overprecision in judgment, but until the current research no known work has actually captured evidence of strategic overprecision by differentiating between individuals' private beliefs and their public judgments. By accomplishing this, the current research provides support for the claims of Yaniv and Foster (1995, 1997). This highlights the importance of considering social context in studying overprecision in judgment. Though the phenomenon is often described as a cognitive bias residing within individuals (e.g., Moore et al.,

2015; Moore & Healy, 2008; Gigerenzer & Hoffrage, 1995; Juslin et al., 2007), this research suggests that the bias can be exacerbated by strategic social considerations.

A second contribution of the current research is that it provides evidence of certainty posturing being motivated by strategic impression management. Impression management behaviors are marked by the value and instrumentality of impression management (Bolino, 1999; Leary & Kowalski, 1990). Because the current research demonstrates that communicators' public certainty displays are exacerbated in relation to their private beliefs only in situations where there is economic value to impression management (e.g., an expertise-signaling incentive) and certainty displays are instrumental towards achieving impression management goals (e.g., under internal uncertainty), this supports the strategic impression management account of certainty posturing. In so doing, it differentiates from theoretical accounts that characterize overconfidence as a motivated reasoning process that results from delusional private beliefs triggered by impression management motives (e.g., Anderson et al., 2012).

Somewhat unexpectedly, the current research failed to find support for certainty posturing being a byproduct of motivated reasoning. This occurred despite the presence of experimental conditions that should presumably facilitate the effect. For instance, Experiments 2 and 3A elicited advisors' private judgments *after* their public communications. Because people engage in motivated reasoning processes to rationalize their deceptive behavior (e.g., overstating their certainty), they often display a pattern of self-deception where they align their private beliefs with their own deceptive claims despite being incentivized to make accurate private judgments (Chance et al., 2011). As such, one would expect that advisors provided with expertise incentives and faced with internal uncertainty should be particularly likely to engage in motivated reasoning processes by aligning their private beliefs with their public claims in order

to avoid facing the reality that they have engaged in ethically questionable behavior by overstating their certainty. But this was not the case. Further, in Experiment 1, which did not provide incentives for accurate private judgments and counterbalanced the order of communicators' judgments (i.e., public versus private), there was still no effect of an expertise incentive on the width of confidence intervals. Additionally, the effect of expertise incentives on communicators' confidence interval judgments was unaffected by whether their private judgments came before or after their public judgments, $F(1, 356) = 0.51$, $p = .48$.

Limitations and Future Directions

While the current research sheds important light onto what motivates certainty posturing, it raises several unanswered questions. First, it is unclear how important it is for people to self-identify as experts in order to perceive a motive to engage in certainty posturing. One possibility is that individuals who strongly self-identify as experts in a domain are particularly likely to perceive a credibility threat when faced with internal uncertainty. In the current research, there is not necessarily reason to believe that participants strongly self-identified with the experimental task, as they were placed in a position of relative expertise on arbitrary tasks. People primarily experience identity threats in domains that they highly identify with (Schmader, 2002; Steele, 1997; Steele, Spencer, & Aronson, 2002), so this raises the possibility that expert advisors may be even more likely to engage in certainty posturing as a compensatory strategy when they are faced with internal uncertainty in a domain for which their status as an expert is an important aspect of their self-concept. In other words, when threatened with evidence that they may lack important information in the domain (i.e., internal uncertainty), experts may be particularly likely to reassert their expertise by inflating their certainty.

A second unanswered question is that, although internal uncertainty appears to activate a presumption that expressing it will undermine one's credibility in the eyes of evaluators, it is unclear how beliefs about the assumptions of evaluators may influence this perception. This could be a worthwhile avenue for future research. For example, because statements focused on an individual's confidence or accuracy (internal linguistic frames) activate a greater credibility threat than statements focused on an event's likelihood (external linguistic frames), the choices that consumers of advice make in how they frame questions about situational risk may influence the extent to which advisors perceive a need to engage in certainty posturing as an expertise-signaling tactic. While asking about somebody's confidence in a manner that alludes to their ability to provide sound recommendations (e.g., "how confident are you that your plan will be profitable?") may generate the impression that one perceives certainty as diagnostic of expertise, asking in a manner that instead focuses on the likelihood of a specific outcome (e.g., "how likely is it that this plan will be profitable?") may generate the impression that one understands the uncertainty inherent in complex situations and is therefore more tolerant of uncertainty.

Relatedly, beliefs about the expertise of one's audience may also influence whether uncertainty activates a credibility threat. While novice audiences may be perceived as too ignorant to understand the varying sources of uncertainty involved in a situation, experts may be perceived as fully aware of the uncertainty inherent in the situation. There may even be a possibility that in some cases, conveying *un*certainty by raising an external source of uncertainty that an expert audience may not have previously considered could be perceived as a more effective means of conveying expertise.

A final question worth considering is when certainty posturing might arise from motivated reasoning processes. Although the current research primarily finds evidence of

certainty posturing being motivated by strategic impression management, this does not necessarily mean that it cannot be exacerbated by motivated reasoning processes that bias private judgments. People often balance the pursuit of self-interest with the need to conceive of themselves as ethically upstanding individuals by only engaging in minor degrees of dishonesty (Mazar, Amir, & Ariely, 2008). Thus, to the extent that certainty posturing is perceived as a benign form of deception, people may easily rationalize it in the absence of self-deception that biases their private beliefs. However, when the adverse consequences of their biased advice are salient, advisors might be more likely to engage in motivated reasoning. People are sensitive to the amount of harm deception causes others (Gneezy, 2005), so facing the reality that their biased judgment has adversely impacted others might cause advisors to question their own integrity. People judge integrity-based trust violations more severely than competence-based trust violations (Kim, Dirks, Ferrin, & Cooper, 2006), so advisors may prefer to delude themselves into believing that any harm their biased advice caused others was a byproduct of genuine incompetence rather than a symptom of flawed moral character.

Yet another possibility could be that motivated reasoning exacerbates exaggerated public certainty displays for certainty judgments that are comparative in nature. Status-attainment motives bias individuals' private judgment about their relative abilities (Anderson et al., 2012). Although this form of overconfidence is distinct from overprecision (Moore & Healy, 2008), there could be some overlap if certainty judgments are framed with respect to one's relative ability. For example, rather than simply assessing their likelihood of making an accurate judgment, advisors may instead be asked about their likelihood of beating competitors or the market. To the extent that people are more motivated to believe in their relative abilities than in the accuracy of their judgment, impression management motives may bias their private judgment

for these types of comparative certainty judgments. Indeed, there is evidence that people will overstate their likelihood of beating the competition when attempting to deter competitors (Charness, Rustichini, & van de Ven, 2017).

Conclusion

Though the search for a parsimonious explanation of overprecision in judgment remains elusive (Moore et al., 2015), the current research suggests that strategic impression management motives of conveying expertise and asserting one's credibility can play a pivotal role. Whether one is an expert advisor, a media pundit, or even the President of the United States, people often perceive displays of certainty as likely to bring economic and social rewards. Unfortunately, incentive schemes that encourage advisors to have clients call on their advice as frequently as possible are prevalent in advice markets. For example, a 2011 survey found that 85% of the revenue earned by financial advisory firms came from an asset-based fee structure, which rewards advisors for convincing their clients to invest increasing sums of money into their portfolios (Maxey, 2011). When combined with evidence that consumers of advice often fail to adequately discount the certainty displays of biased advisors, this suggests that certainty posturing may pose a serious risk for those who rely on experts for information about the underlying uncertainties in particular domains. Though often not conceptualized as a conflict of interest, the evidence suggests that compensation schemes rewarding advisors for building a large base of clients with frequent advice requests encourage them to engage in disingenuous displays of certainty in the accuracy of their own judgment—a conflict of interest in its own right.

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Appendix

Pretest 1 Vignettes

Scenario 1: Financial Advice

You are a financial advisor. A new client has approached you with two potential investment opportunities. The client is committed to investing in one of the opportunities, but not both. These potential investments will be referred to as Investment A and Investment B.

The client is paying you a small fee to provide advice about the best investment option.

[Page Break]

Internal Uncertainty Condition

After evaluating your client's investment options, you realize that they both belong to the same industry. The industry is stable and investments belonging to it earn predictable returns. However, you are very uninformed about recent happenings in the industry. Because of uncertainty stemming from your insufficient knowledge of the industry, you conclude that there is a 50% chance that Investment B will earn a better return than Investment A.

External Uncertainty Condition

After evaluating your client's investment options, you realize that they both belong to the same industry. The industry is unstable and investments belonging to it earn unpredictable returns. However, you are very informed about recent happenings in the industry. Because of uncertainty stemming from the unpredictability of the industry, you conclude that there is a 50% chance that Investment B will earn a better return than Investment A.

Scenario 2: Marketing Consultant

You are a marketing consultant. A company's executives have approached you for advice about whether to launch a new marketing campaign through online advertisements or television commercials. The company only has the resources to commit to one of these strategies, but not both.

The company is paying you a small fee to provide advice about the best strategy.

[Page Break]

Internal Uncertainty Condition

After reviewing the company's planned campaign, you realize that an upcoming Congressional vote with a predictable outcome will result in drastic changes to advertising regulations for the types of products sold by the company. However, you have inadequate knowledge about similar marketing campaigns to help you determine which strategy is best. Because of uncertainty stemming from your lack of knowledge about similar campaigns, you conclude that there is a 50% chance that television commercials will be more profitable than online advertisements.

External Uncertainty Condition

After reviewing the company's planned campaign, you realize that an upcoming Congressional vote with an unpredictable outcome may result in drastic changes to advertising regulations for the types of products sold by the company. However, you have extensive knowledge about similar marketing campaigns to help you determine which strategy is best. Because of uncertainty stemming from the unpredictability of advertising regulations, you conclude that there is a 50% chance that television commercials will be more profitable than online advertisements.

Scenario 3: Legal Advice

You are a lawyer who specializes in providing legal advice about whether to proceed with lawsuits. A prominent artist approaches you for advice about whether to file a copyright infringement lawsuit against a company that used an image bearing a striking resemblance to one of her paintings in a financially lucrative marketing campaign. The artist never provided the company with permission to display her work in the campaign.

The artist is paying you a small fee to provide advice about whether to move forward with the lawsuit against the company for copyright infringement. As you are not a trial lawyer, the artist will not owe you additional fees should she decide to move forward with the lawsuit.

[Page Break]

Internal Uncertainty Condition

After reviewing the case, you realize that because you have insufficient knowledge about similar cases, it is very difficult for you to estimate the legal fees that will be incurred by the artist for proceeding with the lawsuit. However, prior rulings in copyright infringement cases have been consistent and predictable. Due to the uncertainty stemming from your unfamiliarity with similar cases, you conclude that there is a 50% chance that filing the lawsuit will be a winning financial proposition.

External Uncertainty Condition

After reviewing the case, you realize that based on your extensive knowledge about similar cases, it is very easy for you to estimate the legal fees that will be incurred by the artist for proceeding with the lawsuit. However, prior rulings in copyright infringement cases have been inconsistent and unpredictable. Due to the uncertainty stemming from the irregularity of prior rulings, you conclude that there is a 50% chance that filing the lawsuit will be a winning financial proposition.

Table 1

Experiment 1: 90% CI widths and hit rates by expertise incentive and publicity

	90% CI Width (pounds)		Hit Rate	
	Public Judgment	Private Judgment	Public Judgment	Private Judgment
Expertise Incentive	39.78[a]	43.65[b]	0.57[a]	0.61[b]
	(22.98)	(31.35)	(0.28)	(0.27)
No Expertise Incentive	51.24[c]	49.87[bc]	0.63[b]	0.63[b]
	(33.85)	(34.60)	(0.29)	(0.29)

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

Table 2

Experiment 2: Regressions predicting advisee certainty and hiring likelihood

	Advisee Certainty			Advisee Hiring Likelihood		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Hiring Incentive	4.04*	0.46	-5.41	0.24	-0.34	-0.28
	(1.72)	(1.60)	(4.98)	(0.28)	(0.37)	(1.51)
Advisor Certainty		0.50***	0.46***		0.10***	0.10***
		(0.03)	(0.04)		(0.01)	(0.01)
Hiring Incentive X			0.09			-0.001
Advisor Certainty			(0.06)			(0.02)

Note. Numbers represent coefficient estimates (standard errors in parentheses). Models 1-3 are linear regression models nesting advisee estimates within advisors using advisor-specific random intercepts (estimated using maximum likelihood estimation). Models 4-6 are logistic regression models nesting advisee estimates within advisors using advisor-specific random intercepts (estimated using adaptive quadrature with twelve integration points).

Advisee Hiring Decision = 0 if in the advisee elected not to hire the advisor, 1 if the advisee elected to hire the advisor.

Hiring Incentive = 0 for no hiring incentive, 1 for hiring incentive.

*$p < .05$. ***$p < .001$.

Table 3

Experiment 3A: Regressions predicting advisee certainty and hiring decisions

	Advisee Certainty			Advisee Hiring Decision		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Internal Frame	2.94*	1.01	2.14	0.24	-0.03	-3.90***
	(1.32)	(1.29)	(3.94)	(0.23)	(0.26)	(1.04)
Advisor Certainty		0.42***	0.42***		0.06***	0.04***
		(0.02)	(0.03)		(0.01)	(0.01)
Internal Frame X Advisor Certainty			-0.01			0.05***
			(0.05)			(0.01)

Note. Numbers represent coefficient estimates (standard errors in parentheses). Models 1-3 are linear regression models nesting advisee estimates within advisors using advisor-specific random intercepts (estimated using maximum likelihood estimation). Models 4-6 are logistic regression models nesting advisee estimates within advisors using advisor-specific random intercepts that (estimated using adaptive quadrature with twelve integration points).
Advisee Hiring Decision = 0 if in the advisee elected not to hire the advisor, 1 if the advisee elected to hire the advisor.
Internal Frame = 0 for external frame condition, 1 for internal frame condition.
*$p < .05$. ***$p < .001$.

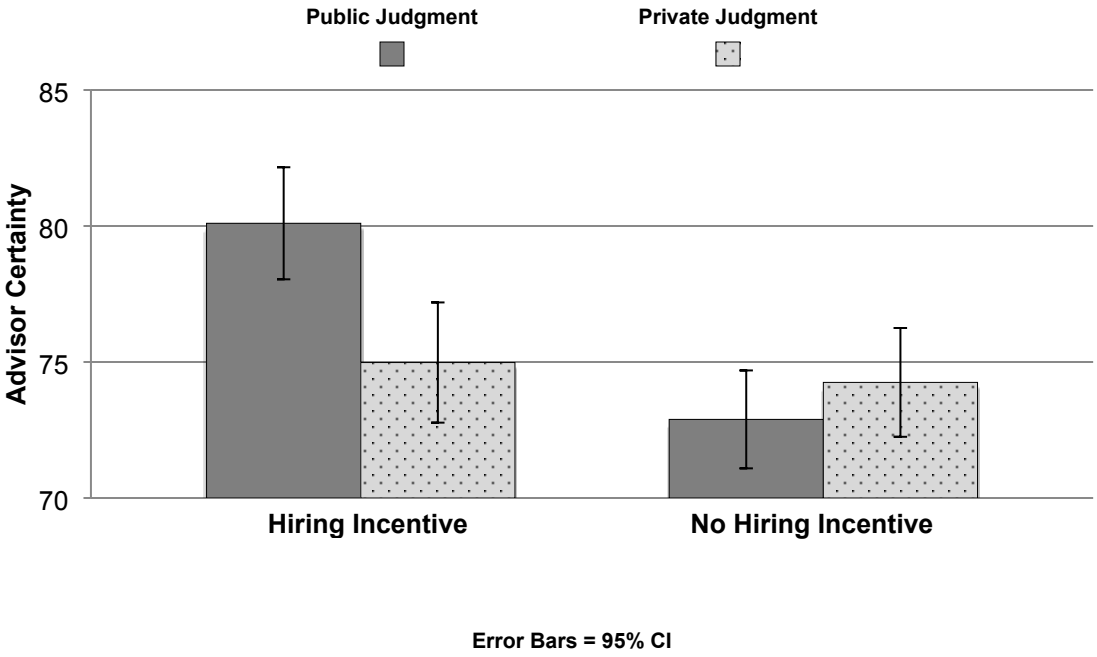

Figure 1. Experiment 2: Advisor certainty by hiring incentive and estimate type.

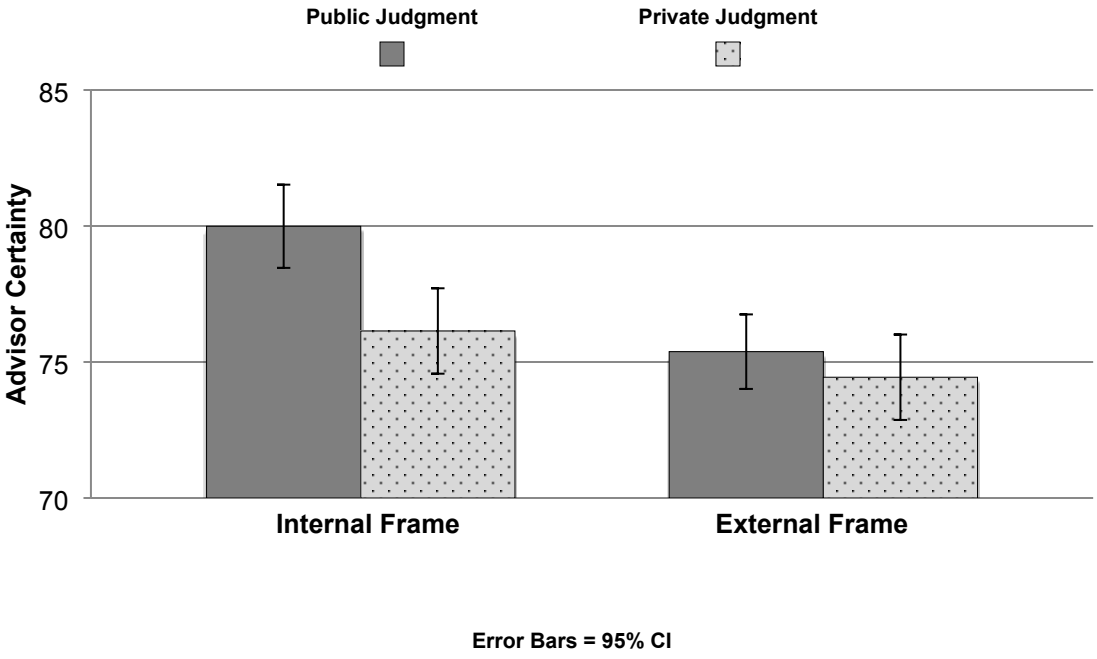

Figure 2. Experiment 3A: Advisor certainty by linguistic frame and judgment type.

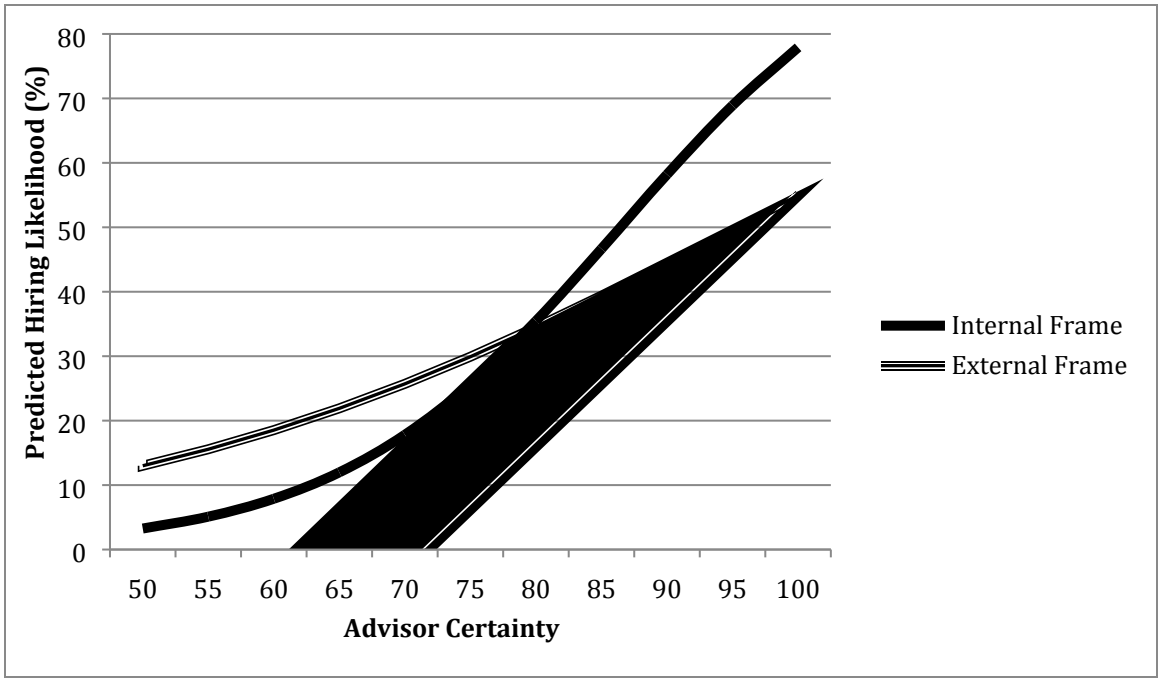

Figure 3. Experiment 3A: Predicted hiring likelihood by advisor certainty and linguistic frame.