Is Overconfidence a Social Liability?

The Effect of Verbal versus Nonverbal Expressions of Confidence

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Abstract

What are the reputational consequences of being overconfident? We propose that the channel of confidence expression is one key moderator—that is, whether confidence is expressed verbally or nonverbally. In a series of experiments, participants assessed target individuals (potential collaborators or advisors) who were either overconfident or cautious. Targets expressed confidence, or a lack thereof, verbally or nonverbally. Participants then learned targets' actual performance. Across studies, overconfidence was advantageous initially—regardless of whether targets expressed confidence verbally or nonverbally. After performance was revealed, overconfident targets who had expressed confidence verbally were viewed more negatively than cautious targets; however, overconfident targets who had expressed confidence nonverbally were still viewed more positively than cautious ones. The one condition wherein nonverbal overconfidence was detrimental was when confidence was clearly tied to a falsifiable claim. Results suggest that, compared to verbal statements, nonverbal overconfidence reaps reputational benefits because of its plausible deniability.

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Is Overconfidence a Social Liability?

The Effect of Verbal versus Nonverbal Expressions of Confidence

Most of us have been in a situation where someone expressed great confidence in his or her knowledge or skills, and was later shown to be utterly wrong—for example, a coworker who stated his opinion with an air of total certainty, and yet was later exposed to be wholly misguided. Conceivably, justice ought to deliver a social sanction to such an overconfident person; perhaps he should lose credibility, or at least his judgments or knowledge should face more suspicion and scrutiny in the future.

However, empirical evidence suggests that when an individual's overconfidence is exposed to others, it only sometimes incurs social sanction. For example, in vignette studies, confident witnesses became less influential than cautious ones after they were shown to be overconfident (e.g., Tenney, MacCoun, Spellman, & Hastie, 2007). However, other research found that overconfidence, even after it was exposed to others, did not damage a person's reputation (Kennedy, Anderson, & Moore, 2013). Those who acted confident through tone of voice and posture were afforded higher status and influence by others even after they were shown to be overconfident about their abilities. These empirical findings dovetail with anecdotal evidence; in the workplace, highly confident people sometimes maintain their influence and standing in the eyes of others, despite a history of making inaccurate claims. Even in the political realm, it is easy to think of candidates who win elections despite being exposed as unjustifiably overconfident.

A critical question thus remains: when is overconfidence punished, and when do the reputational benefits of confidence persist, even after a person's poor performance is revealed? In this paper, we propose that the channel of confidence expression plays a key role in

determining whether overconfidence is a social liability—that is, whether confidence is expressed verbally or nonverbally[1]. We conducted a series of experiments to test this idea. Experiments 1 and 2 examine whether the social consequences of overconfidence differ depending on the channel of communication, by asking participants to evaluate targets from vignettes, video stimuli, or a live interaction. Experiments 3 through 5 test the hypothesized explanation of this difference—namely, whether overconfidence expressed verbally is easier to falsify, and therefore, more likely to be a liability, than nonverbal overconfidence. We call this explanation the *plausible deniability hypothesis*, and describe it in more detail below. In short, we suggest that overconfident individuals are able to retain their status and influence when they express their confidence nonverbally because nonverbal expressions are typically more conducive to plausible deniability.

The current research thus makes a number of contributions. First, it helps reconcile two opposing lines of research, one showing that overconfidence has a cost after being exposed and one showing that it does not. Second, it helps explain whether and when overly positive self-perceptions or accurate self-perceptions are more advantageous for the individual (e.g., Dunning, 2005; John & Robins, 1994; Kim, Chiu, & Zou, 2010; Taylor et al., 2003; Tenney, Vazire, & Mehl, 2013). Third, it speaks to whether reputational dynamics function in the way that they "should"—namely, whether modest, truthful contributors develop positive reputations and boastful narcissists develop negative reputations (Anderson & Shirako, 2008; Bromley, 1993; Fehr & Gachter, 2002).

[1] For simplicity, we group vocal cues, such as volume and speech rate with *nonverbal* expressions of confidence (e.g., Hall, Coats, & Smith LeBeau, 2005; Mohammadi, Vinciarelli, & Mortillaro, 2010), although these types of cues may more precisely be categorized as *paraverbal* or *paralingual* (e.g., Scherer, London, & Wolf, 1973; Schuller et al., 2013).

Prior Research on the Social Consequences of Overconfidence

Generally, overconfidence is defined as inaccurate, overly positive perceptions of one's abilities or knowledge (for reviews, see Meikle, Tenney, & Moore, 2016; Moore & Healy, 2008). Prior research has found that overconfident individuals (for example, individuals who hold an exaggerated belief that they are more competent than others), often get treated as though they are actually competent (Anderson, Brion, Moore, & Kennedy, 2012; Radzevick & Moore, 2011; Tenney & Spellman, 2011; Tracy & Robins, 2007; von Hippel & Trivers, 2011).

Those who claim to be better than others (when they are not) run the risk of being identified as overconfident (Dufner et al., 2013; Hoorens, Pandelaere, Oldersman, & Sedikides, 2012). Sometimes objective evidence surfaces that directly contradicts the claims of highly confident individuals. Prior research is split on whether this exposure of overconfidence diminishes a person's social standing. In some studies, individuals who expressed confidence, and were later revealed to be wrong, lost credibility in the eyes of others. For example, in a series of lab experiments, eyewitnesses who were confident but wrong about a memory were then less believable when testifying with confidence about other memories (Tenney et al., 2007; Tenney, Small, Kondrad, Jaswal, & Spellman, 2011; Tenney, Spellman, & MacCoun, 2008). Overconfident job applicants met a similar fate. They were initially preferred to more modest applicants; however, once it became known that they had exaggerated a crucial job skill, they were passed over, even though they were equal in skill to other applicants (Tenney & Spellman, 2011).

However, in other studies, individuals who were exposed as overconfident were not held liable. Kennedy et al. (2013) conducted three studies in which individuals' overconfidence was measured naturalistically in group settings or was manipulated experimentally. They found that

individuals who displayed confidence were initially afforded higher status when others were unaware that the confidence was unjustified by actual task ability. Yet even after participants gained clear, objective information about individuals' actual task performance, they did not penalize overconfident individuals with lower status—that is, overconfidence did not lead to lower status in the group compared to individuals with accurate self-perceptions.[2]

How might we reconcile these findings? Why was overconfidence socially costly in one set of circumstances, but not in another? We propose that the channel of communication through which confidence was expressed may represent an important moderator, because each channel affords different levels of plausible deniability. The research cited above which found overconfident individuals lost credibility after being exposed, focused on verbal expressions of overconfidence. Participants observed targets who verbally stated their level of confidence in their claims. In contrast, the research that found overconfident individuals were not socially sanctioned focused on primarily nonverbal expressions of overconfidence. Those studies focused on naturalistic expressions of overconfidence in group contexts, where overt statements of confidence are rare and confidence is mostly communicated nonverbally (Anderson et al., 2012); the studies that manipulated confidence did so through nonverbal behaviors such as vocal tone and posture.

Channel of Expression

Researchers who study overconfidence have traditionally focused on explicit verbal and numeric expressions of confidence (Budescu & Wallsten, 1995; Windschitl & Wells, 1996). The obvious benefit from a researchers' perspective is that these types of confidence expressions can

[2] The current paper is focused specifically on situations in which individuals' overconfidence is exposed to others, and the social consequences of that exposure. Therefore, we limit our review here to prior studies that speak to that specific situation.

be tested and falsified. When people claim they are 100% confident of success, it is easy to show that they are, in aggregate, overconfident if they succeed less than 100% of the time. Research on verbal expression of confidence and overconfidence has made a great deal of progress in understanding the psychology of confidence and how it is experienced (Moore & Healy, 2008). There is strong evidence that people are frequently overconfident, and that this overconfidence is most often attributable to their being excessively sure that they know the truth (see Ehrlinger & Eichenbaum, 2016; Meikle, Tenney, & Moore, 2016, and Moore, Tenney, & Haran, 2015, for recent reviews).

However, overconfidence can also be expressed without words (Ridgeway, 1987). Confident people nod their head for emphasis (Briñol & Petty, 2003). They state their views boldly and loudly (Scherer, London, & Wolf, 1973). Overconfident people show these same behaviors. They speak first and dominate conversation, speak with authority, and show little deference to others (Anderson et al., 2012). Combining these two bodies of research illuminates that manifestations of overconfidence in an interpersonal setting can occur via two different channels: verbal and nonverbal.

What is the functional difference between the two channels of confidence expression? Drawing from the literature on communication, we hypothesize that *plausible deniability* can help explain why overconfidence, expressed nonverbally, would be less likely to be a social liability than overconfidence expressed verbally: namely, it is more difficult to definitively unveil. Early communication theorists began discussing plausible deniability as they moved away from theories that explained linguistic structure, and gave more consideration to the social and relational context of language. For example, foundational work on face saving (Goffman, 1959) and politeness behaviors (Brown & Levinson, 1987), as well as more recent work on

indirect speech (Pinker, Nowak, & Lee, 2008) demonstrate that when people avoid making direct claims or requests, they can shrewdly navigate a complex social landscape of cooperation and competition. We follow in the footsteps of this paradigm shift by exploring the social consequences of more veiled, indirect communication.

In contrast to the notion that nonverbal behavior provides clear and reliable signals of internal states (Burgoon, 1994; Ekman, Davidson, & Friesen, 1990), one of the most defining and distinguishing features of nonverbal behavior, compared to verbal behavior, is that nonverbal behavior allows people to convey information but maintain plausible deniability if they do not want to commit to or be held accountable for a particular stance (e.g., DePaulo, 1992; Keating, 2016). Nonverbal behaviors are conducive to plausible deniability for several reasons. One is that people cannot directly observe their own nonverbal behavior, and so people can claim, for example, that they aren't meaning to display a particular facial expression or use a particular vocal tone. Nonverbal behaviors are also more difficult for observers to describe to others, and so there is less social accountability for nonverbal behaviors (DePaulo, 1992; Goffman, 1959). It would be harder to accurately explain to a third party the precise way someone acted than to relay verbatim what someone said. Therefore, in DePaulo's (1992) words, "The special qualities of nonverbal behaviors should add up to an absolution of responsibility for the self-presenter. People are probably not held accountable for behavior that is irrepressible, that can be triggered quickly and automatically, that is inaccessible to them and elusive to others" (p. 207).

This idea is echoed in other discussions of nonverbal behavior; for example, conveying liking for another person with nonverbal behaviors rather than verbal behaviors is seen as involving "less risk" (Floyd & Burgoon, 1999, p. 220) for the communicator because it is easier to move forward as though nothing awkward has happened if feelings are not reciprocated. In

addition, when people accuse someone of violating social norms, they typically do so indirectly with nonverbal behavior, such as looking at someone suspiciously (e.g., narrowing one's eyelids). People likely do this because "overt accusation is dangerous," in that it would be more likely to invite retaliation and backlash (Scheflen, 1972, p.161).

Consistent with this reasoning, the *plausible deniability hypothesis* posits that nonverbal modes of confidence expression provide plausible deniability because typically, these expressions are not as clearly tied to specific levels of confidence about performance as are verbal expressions. They leave room for plausible deniability. For example, it is difficult to attach a specific level of confidence in performance to a coworker who speaks in a loud voice and interrupts his or her rivals during a meeting. Does a loud voice mean they are 60%, 70%, or 95% sure? Even if the high level of confidence is communicated to others, how much is that confidence clearly and distinctly about performance in the task at hand? If nonverbal expressions of confidence cannot be indisputably tied to specific falsifiable claims, they reduce the risk of being identified as overconfident. Therefore, people who express confidence nonverbally can often benefit from this confidence but also from plausible deniability if their actual performance falls short or if they are proven wrong about a specific claim (e.g., "Well, she didn't *say* she was highly confident about *that*").

This is not to say that nonverbal behavior is *always* plausibly deniable or that verbal behavior can *never* be so. On the contrary, if someone nods enthusiastically in response to a pointed question, it would be difficult to deny the affirmative response later, and plausible deniability would be relatively low. Likewise, Pinker, Nowack, and Lee (2008) argue that indirect speech (e.g., saying, "Gee, officer, is there some way we can take care of the ticket here?" instead of a direct request to exchange money for leniency) is adaptive precisely because

it provides more plausible deniability for the speaker (Pinker, Nowack, & Lee, 2008, p. 833; and see Lee & Pinker, 2010). In the current research, we create and capitalize on situations in which nonverbal behavior is and is not conducive to specific accountability in order to test the psychological processes involved in interpreting displays of overconfidence.

Overview of Experiments

We present a series of experiments asking participants to compare two potential collaborators (Experiments 1-4) or two advisors (Experiment 5). In each experiment, one of the two targets was confident and the other was cautious.[3] The target expressed his or her confidence verbally or nonverbally, depending on condition. Then participants received performance information that could help them detect overconfidence. We predicted that verbally expressed confidence, when coupled with poor performance (which we call *verbal overconfidence*), would damage the target's reputation, but that nonverbally expressed confidence, when coupled with poor performance (which we call *nonverbal overconfidence*), would not be similarly costly. We expected this difference because verbal expressions are so easily tied to specific, falsifiable claims. Nonverbal manifestations of overconfidence, such as dominating a conversation or exhibiting an expansive posture (Anderson et al., 2012; Hall, Coats, & Smith LeBeau, 2005; Kimble & Seidel, 1991), are not so easily tied to particular claims and therefore—as is hypothesized to be characteristic of nonverbal behaviors more generally—are not so easily exposed as false.

Experiments 1-2 test whether the social consequences of overconfidence differ depending on the channel of communication. Experiments 3-5 test the *plausible deniability hypothesis*

[3] The benefit of including a cautious person in each condition is for experimental control. It would be difficult to perfectly equate all messages that get communicated when someone expresses confidence via verbal versus nonverbal channels. We can therefore compare the differences between the confident and cautious collaborators or advisors within and across conditions.

more directly—namely, the idea that when overconfidence is expressed nonverbally, it is typically harder to detect or prove, and therefore, is less likely to constitute a social liability, than verbal overconfidence. We also test the alternative hypothesis that nonverbal confidence is simply so compelling that even the revelation of poor performance will not shatter a person's positive impression. We pit this nonverbal-confidence-is-always-good account against the *plausible deniability hypothesis*, which posits that nonverbal overconfidence is compelling primarily when there is uncertainty (or *plausible deniability*) regarding whether someone was actually overconfident. In Experiment 3, potential collaborators express confidence verbally or nonverbally and then deny being overconfident; we measure the perceived plausibility of these denials. In Experiment 4, we take advantage of an exception to the link between nonverbal behavior and plausible deniability. Targets' nonverbal confidence was either attached to their performances (i.e., low plausible deniability) or unattached (i.e., high plausible deniability). In Experiment 5, participants evaluated advisors' competence at the job. This experiment included an additional control condition, useful for testing the moderating role of plausible deniability.

Predictions. We predicted the following:

1. Prior to performance feedback, confident targets (i.e., potential collaborators or advisors) will be evaluated more positively than cautious targets. This advantage for confident targets should hold regardless of whether confidence is expressed verbally or nonverbally.

2a. After performance feedback, if performance is low, then targets who express confidence in their performance verbally will incur a greater social cost than targets who express confidence nonverbally. In other words, the confident target will be viewed more negatively than the cautious target, when his or her confidence is expressed verbally rather than nonverbally.

2b. After performance feedback, if performance is low, and if targets overtly deny being confident in their performance, then targets who express confidence in their performance nonverbally will be more believable than targets who express confidence in their performance verbally.

3. In qualification of prediction 2a (and 2b), if targets' nonverbal confidence is clearly linked to their performance, then when performance is revealed to be low, targets who express confidence in their performance will incur the same penalty, regardless of whether confidence is expressed verbally or nonverbally.

These results would, first, confirm the well-established finding that expressing confidence and even overconfidence tends to promote success in social situations, absent concrete performance information (prediction 1); second, these results would provide support for the proposed hypothesis that the channel of communication can moderate the social benefits of overconfidence (predictions 2a and 2b). In addition, they would provide evidence for the *plausible deniability hypothesis*, that nonverbal behavior is often a "noisy" signal, and therefore it is difficult to recognize with certainty nonverbal behavior as *over*confident. In the presence of a clear signal (e.g., a target expressed nonverbal confidence clearly and specifically about his or her task performance), the difference between channels of communication should disappear (prediction 3). Thus, nonverbal overconfidence will not *always* be unpunished; ultimately, whether it is will depend on plausible deniability.

Some participants were drawn from a pool of undergraduates attending one of two universities in the Mountain or West Coast regions of the United States (Experiments 2 and 5). Participants in other experiments (1A, 1B, 3, and 4) were drawn from the online participant pool, Amazon Mechanical Turk. This participant pool is typically older and more diverse, with

broader geographic representation across the United States, with more experience in the workforce and more experience participating in experiments compared to undergraduate participant pools (Buhrmester, Kwang, & Gosling, 2011).

We employed several techniques to appropriately power our hypothesis tests. We conducted power analyses prior to running each experiment using effect size estimates that we thought were most relevant to our studies. When feasible, we included manipulation checks. Some of our manipulations were within-subjects, which also helps increase power compared to between-subjects manipulations.

We report how we determined our sample size, all data exclusions (if any), all conditions, and all measures. Survey materials could not be posted during blind review because several authors participated as actors (but see Appendices A and B). All preregistrations and data are available through the following links:

Experiment 1A: https://osf.io/jh9jm/?view_only=adb5f5b074a443f2a369e435793ae875

Experiment 1B: https://osf.io/svy3w/?view_only=42e7d86251da4b088f430199d571b0d2

Experiment 2 (only sample size and hypotheses were preregistered):
https://osf.io/5zvah/?view_only=bf40d48249964cca8fa1f4a64619ddcf
and https://osf.io/9ydbs/?view_only=2e542e823a1b4ebfb13dec59589a4e14

Experiment 3: https://osf.io/eyftj/?view_only=aa78d3a2725e40a584879c865c6a3e32

Experiment 4: https://osf.io/7tsg4/?view_only=6f8c62440c7845e1abbf70f760cdd4e3

Experiment 5 (not preregistered):
https://osf.io/nsd8p/?view_only=3c3f28680b174f12befe718b739f0307

Experiment 1A: Male Candidates

Method

Participants

Four hundred forty-four participants completed this experiment on Amazon Mechanical Turk (MTurk). We had preregistered a sample size of 442. We selected this sample size prior to data collection based on 85% power for an effect size of $\eta_p^2 = .02$, for the predicted three-way interaction. We excluded no participants.

Design and Procedure Overview

The experiment had a 2 time (Time 1: before performance information vs. Time 2: after performance information, within subjects) x 2 confidence (confident vs. cautious candidate, within subjects) x 2 channel (verbal vs. nonverbal, between subjects) mixed design. The order of who came first (the confident or cautious candidate) and which actor played each candidate was counterbalanced. Participants either saw two candidates expressing their degree of confidence verbally, via written text, or nonverbally, via recorded video.

Participants first completed a practice round consisting of 10 emotion-estimation problems (adapted from http://greatergood.berkeley.edu/ei_quiz/) in which participants looked at photos of faces and guessed the emotion the face displayed. After the practice round, participants learned they would then complete a "money round" with a collaborator. Their scores would be averaged with the score of the collaborator, and would determine their chances of winning a $50 drawing. They could select the collaborator from among two candidates who had also completed the same practice round. Participants learned background information about the candidates (e.g., where they were from) and observed the candidates' confidence through different channels of communication (verbal, via written text; or nonverbal, via recorded video).

Participants then evaluated the candidates as potential collaborators (Time 1 judgments). Next, participants were given false but realistic information about how well each candidate had performed on the practice round, so they could compare candidates' confidence to candidates' practice-round performance. Then they reevaluated the candidates and selected one as a collaborator (Time 2 judgments). Finally, participants completed the collaborative "money round," in which their scores were averaged with the selected candidates' actual score (we had the actors who acted as the confident and cautious candidates actually complete the task) to determine payment.

Confidence and Channel Manipulations

For the nonverbal conditions in which potential collaborators were presented via video, two male actors in their mid-late 20s acted the part of the confident and cautious candidates. They provided true background information about themselves (e.g., where they were from, number of siblings). Each video was about 30 seconds.

Confident Candidate: In the *verbal* condition participants read background information about the candidate. Then, modeled after previous research (e.g., Tenney et al., 2007), they read that the confident candidate had stated, "I'm confident that I did excellent in the Practice Round. I would say that I performed better than the vast majority of people who completed the task." In the *nonverbal* condition, participants did not read verbal statements from the candidate about the practice test. Instead, confidence was displayed through the candidate's nonverbal behavior when the candidate provided the background information (e.g., where they were from). Specifically, the candidate had an expansive body position (i.e., arms on the backs of two adjacent chairs, and then behind the candidate's head) while looking up at the interviewer and speaking with a confident voice. We selected these nonverbal indicators of confidence based on

prior research (Anderson et al., 2012; Kennedy et al., 2013; Ridgeway, 1987; Van Zant & Andrade, 2016).

Cautious Candidate: The cautious candidate served as a control, within each communication channel, to account for artifactual differences between channels. In the *verbal* condition, after reading the background information, participants read that the cautious candidate had stated, "I am not confident that I did well in the practice round. Compared to other people who completed the task, I probably scored below average." In the *nonverbal* condition, the candidate provided background information to the interviewer while maintaining a constricted body posture (i.e., leaning forward, with hands in front of him) while looking down, not at the interviewer, and speaking in a soft, timid voice (see Anderson et al., 2012; Kennedy et al., 2013; Ridgeway, 1987; Van Zant & Andrade, 2016).

Time 1 Judgments

Participants rated, "*How much do you want to collaborate with each candidate during the Money Round?*" and "*How much do you trust each candidate to do a good job during the Money Round?*" from 1 to 6. These items were highly correlated (Spearman-Brown inter-item reliability for the confident and cautious candidates, respectively, rs = .76, ps < .001) and were averaged to form a measure of candidate desirability. Participants also selected which candidate they wanted to collaborate with, and, to keep them engaged, described why they chose that candidate. They also answered an exploratory question of how likely they would be to follow each candidate's leadership, to see whether our findings substantiate prior theorizing on leadership (Fritz, Brown, Lunde, & Banset, 2005; Howell & Costley, 2006).

Performance Information

After making Time 1 judgments, participants received more information. They were reminded of who the candidates were via reprinting their statements (verbal condition) or via still photographs from the videos (nonverbal condition). Then they learned that each candidate had performed "below average" on the practice round. Therefore, performance was equally poor across the two candidates.

Time 2 Judgments

Participants again answered the same questions that they had at Time 1. They also responded to a manipulation check to measure perception of candidates' confidence on a 3-point scale with anchors: *Not at all confident (0-25th percentile); Medium (26th-75th percentile)*; and *Very confident (76th-100th percentile).*

Results

There were no consistent significant effects of order or actor, nor are they relevant to our hypotheses, so the results we present omit these variables.

Manipulation Check

According to paired-samples *t*-tests, participants rated the confident candidate as more confident than the cautious one in the verbal ($M_{confident}$ = 2.71, $SD_{confident}$ = .55; vs. $M_{cautious}$ = 1.46 $SD_{cautious}$ = .57), $t(221) = 21.04$, $p < .001$, $d = 2.23$, and nonverbal ($M_{confident}$ = 2.50, $SD_{confident}$ = .65; vs. $M_{cautious}$ = 1.29, $SD_{cautious}$ = .53), $t(221) = 21.02$, $p < .001$, $d = 2.04$, conditions. Thus, the manipulation checks revealed successful manipulations of confidence.[4] There was no

[4] According to independent-samples *t*-tests, participants rated the confident candidate in the verbal condition as more confident than the confident candidate in the nonverbal condition, $t(442) = 3.70$, $p < .001$, $d = .37$, and the cautious candidate in the verbal condition as more confident than the cautious candidate in the nonverbal condition, $t(442) = 3.29$, $p = .001$, $d = .31$. This pattern persisted in each of our Experiments 1 through 3 (although was not always statistically significant). We explored whether these differences in the overall confidence expressed within each channel affected the results in each experiment. We reran all desirability analyses of 3-way and 2-way interactions, with manipulation check ratings of the confident and cautious candidates (which were collected at Time 2) as covariates. The pattern of results and significance either did not change, or effects became stronger (and more

interaction, suggesting the relative difference between the confident and cautious candidates was similar across verbal and nonverbal conditions, $F(1, 442) = .24$, $p = .625$, $\eta_p^2 = .001$.

Desire to Collaborate

As predicted, in a 2 (Time 1 vs. Time 2, within subjects) x 2 (confident vs. cautious, within subjects) x 2 (verbal vs. nonverbal, between subjects) mixed ANOVA, the 3-way interaction between time, confidence, and channel of communication was significant, $F(1, 443) = 25.01$, $p < .001$, $\eta_p^2 = .054$. The 3-way interaction indicates that changes in the relative desirability of the confident and cautious candidates from Time 1 to Time 2 depended on the channel of communication. See Figure 1. It is helpful to unpack this 3-way interaction by examining results at each time of judgment.

At Time 1, participants rated the confident candidate as more desirable than the cautious one in the verbal ($M_{confident} = 4.39$, $SD_{confident} = 1.31$; $M_{cautious} = 3.19$, $SD_{cautious} = 1.34$), $t(221) = 7.95$, $p < .001$, $d = .90$, and nonverbal ($M_{confident} = 4.12$, $SD_{confident} = 1.40$; $M_{cautious} = 3.07$, $SD_{cautious} = 1.38$), $t(221) = 7.60$, $p < .001$, $d = .75$, conditions (paired-samples *t*-tests). There was no interaction at Time 1, suggesting the relative difference between the confident and cautious candidates was similar across verbal and nonverbal conditions, $F(1, 442) = .52$, $p = .472$, $\eta_p^2 = .001$. When choosing between the candidates, 68% of participants in the verbal condition and 69% in the nonverbal condition selected the confident candidate as a collaborator. The tendency to select the confident candidate over the cautious one was significant within each condition, X^2s > 28.80, *p*s < .001, and was similar in strength across conditions, $X^2(1, N = 444) = .042$, $p = .838$.

At Time 2, the pattern of results depended on channel of communication. Preference for the confident candidate reversed at Time 2 in the verbal condition, in that participants now rated

significant) in the expected directions. Thus, our results were likely driven by the channel of communication (verbal versus nonverbal), and not relatively small differences in the total confidence across those conditions.

the cautious candidate (M = 3.19, SD = 1.35) as more desirable than the confident one (M = 2.80, SD = 1.34), paired-samples t-test: $t(221) = -3.74$, $p < .001$, $d = -.29$. When choosing a collaborator, 60% of participants now chose the cautious candidate, $X^2(1, N = 222) = 9.53$, $p = .002$. In contrast, in the nonverbal condition, the confident candidate (M = 2.82, SD = 1.40) remained more desirable than the cautious one (M = 2.45, SD = 1.27), paired-samples t-test: $t(221) = 3.98$, $p < .001$, $d = .28$. Also, 67% of participants selected the confident candidate as a collaborator, $X^2(1, N = 222) = 24.67$, $p < .001$. The tendency to select the confident candidate over the cautious one was significantly stronger in the nonverbal condition compared to the verbal condition at Time 2, $X^2(1, N = 444) = 32.56$, $p < .001$. See Figure 1.

We also investigated whether the degree of punishment for the confident candidate in the verbal condition was stronger than for the confident candidate in the nonverbal condition, in terms of drops in desirability ratings. The negative slope of the line from Time 1 to Time 2 for the confident person in the verbal condition was indeed steeper than in the nonverbal condition, 2-way interaction $F(1, 442) = 3.74$, $p = .054$, $\eta_p^2 = .008$. Thus, the confident candidate likely incurred a larger penalty from Time 1 to Time 2 in the verbal compared to nonverbal conditions even without considering the confident candidates' standing relative to the cautious candidate.

Exploratory Analysis

As specified in our preregistered research plan, we conducted exploratory analyses on the item asking participants how likely it was that they would follow the candidates' leadership. Likelihood of following a candidates' lead was positively correlated with candidate desirability as a collaborator at each Time, rs $\geq .70$, ps $< .001$. Participants were more likely to want to collaborate with candidates whom they saw as having higher leadership potential.

Robustness Check

We conducted a replication of Experiment 1A to test the robustness of the results. There were five key differences from Experiment 1A: 1) We replaced the emotion-guessing problems with an age-guessing task, in which participants looked at photographs and guessed the individuals' age from four multiple choice options. We altered the task to address the concern that judging emotions primed participants to monitor nonverbal behavior more closely. A second motive was to test whether the results generalized across levels of task difficulty (emotion-guessing was easy for participants, with high average scores, 75% (*SD* = 15%), whereas age-guessing was difficult, with low average scores, 24% (*SD* = 12%); 2) We attempted to make the confident candidate in the verbal condition slightly less confident than he had been (e.g., changing his self-assessment from stating he thought he "did excellent…better than the vast majority of people" to "did well…better than most people"), because the confident candidate in the verbal condition had been rated as slightly more confident than in the nonverbal condition; 3) We gave more precise performance feedback, specifying that each candidate scored 2 out of 10, with 6 being average, to ensure that participants would infer the exact same level of performance across verbal and nonverbal conditions; 4) We altered the language of one of the dependent variable questions for clarity (i.e. we asked participants how much they "expect" the candidate to do a good job, instead of "trust" the candidate to do a good job); and 5) We dropped the exploratory questions about leadership.

Two-hundred-one MTurkers completed this additional experiment. The results closely replicated Experiment 1A.

Manipulation Check. The manipulation of confidence was successful. According to paired-samples *t*-tests, participants rated the confident candidate as more confident than the cautious one in the verbal ($M_{confident}$ = 2.74, $SD_{confident}$ = .50; vs. $M_{cautious}$ = 1.38, $SD_{cautious}$ = .56),

$t(104) = 17.76$, $p < .001$, $d = 2.56$, and nonverbal ($M_{confident} = 2.46$, $SD_{confident} = .63$; vs. $M_{cautious} = 1.29$, $SD_{cautious} = .50$), $t(95) = 13.01$, $p < .001$, $d = 2.06$, conditions. According to an independent-samples *t*-test, despite our attempt to reduce the confident candidate's confidence slightly in the verbal condition, it was still higher than the confident candidate's confidence in the nonverbal condition, $t(199) = 3.56$, $p < .001$, $d = .49$. However, the interaction between channel of communication (verbal vs. nonverbal) and candidate (confident vs. cautious) was not significant, $F(1, 199) = 2.77$, $p = .098$, $\eta_p^2 = .014$, indicating that the relative confidence of the confident candidate compared to the cautious one was similar across conditions.

Desire to Collaborate. In a repeated measures ANOVA, the 3-way interaction between time, confidence, and channel of communication was significant, $F(1, 199) = 8.03$, $p = .005$, $\eta_p^2 = .039$. The 3-way interaction indicates that changes in the relative desirability of the confident and cautious candidates from Time 1 to Time 2 depended on the channel of communication.

Unpacking the 3-way interaction, at Time 1, participants rated the confident candidate as more desirable than the cautious one in the verbal ($M_{confident} = 4.22$, $SD_{confident} = 1.27$; $M_{cautious} = 3.43$, $SD_{cautious} = 1.15$), $t(104) = 4.07$, $p < .001$, $d = .65$, and nonverbal ($M_{confident} = 4.33$, $SD_{confident} = .98$; $M_{cautious} = 3.44$, $SD_{cautious} = 1.15$), $t(95) = 5.34$, $p < .001$, $d = .83$, conditions (paired-samples *t*-tests). When choosing between them, 59% of participants in the verbal condition, $X^2(1, N = 105) = 3.44$, $p = .064$, and 69% in the nonverbal condition, $X^2(1, N = 96) = 13.50$, $p < .001$, preferred the confident candidate as a collaborator. The tendency to select the confident candidate over the cautious one was similar in strength at Time 1 across conditions, $X^2(1, N = 201) = 2.04$, $p = .153$.

At Time 2, the pattern of results depended on channel of communication. Preference for the confident candidate reversed at Time 2 in the verbal condition, in that participants now rated

the cautious candidate (M = 3.09, SD = 1.28) as more desirable than the confident one (M = 2.56, SD = 1.19), paired-samples t-test: $t(104) = -4.11$, $p < .001$, $d = -.43$. When choosing a collaborator, 64% of participants now chose the cautious candidate, $X^2(1, N = 105) = 8.01$, $p = .005$. In contrast, in the nonverbal condition, the confident candidate (M = 2.88, SD = 1.24) remained more desirable than the cautious one (M = 2.59, SD = 1.12), paired-samples t-test: $t(95) = 2.37$, $p = .020$, $d = .25$. Also, 66% of participants selected the confident candidate as a collaborator, $X^2(1, N = 96) = 9.38$, $p = .002$. The tendency to select the confident candidate over the cautious one was significantly stronger in the nonverbal condition compared to the verbal condition at Time 2, $X^2(1, N = 201) = 17.38$, $p < .001$.

Summary

These results provide initial support for the hypothesis that the channel of communication can moderate the social consequences of overconfidence. Although confidence was advantageous initially, it was no longer beneficial if the candidate had expressed confidence verbally and turned out to be wrong, exposing the candidate's confidence to be overconfidence. Nonverbal confidence, on the other hand, remained beneficial, even after poor task performance was revealed (thus confirming predictions 1 and 2a).

Experiment 1B: Female Candidates

Experiment 1B sought to address concerns about differences in how confidence expression by men and women is perceived differently (Rudman & Glick, 2001). The design replicates the design of Experiment 1A identically but uses women actors as potential collaborators instead of men. We preregistered a sample size of 301 based on 90% power for an effect size of $\eta_p^2 = .034$. Thanks to the idiosyncrasies of MTurk completion rates, we obtained

data from 311 participants. We excluded no one. Two women in their 30s acted the part of the confident and cautious candidates. The videos of these candidates were about 20 seconds each.

Results

Manipulation Check

As in Experiment 1A, according to paired-samples *t*-tests, participants rated the confident candidate as more confident than the cautious one in the verbal ($M_{confident}$ = 2.75, $SD_{confident}$ = .50; vs. $M_{cautious}$ = 1.38, $SD_{cautious}$ = .54), $t(156) = 21.59$, $p < .001$, $d = 2.61$ and nonverbal ($M_{confident}$ = 2.63, $SD_{confident}$ = .56; vs. $M_{cautious}$ = 1.29, $SD_{cautious}$ = .54), $t(153) = 18.41$, $p < .001$, $d = 2.44$ conditions. There was no interaction, suggesting the relative difference between the confident and cautious candidates was similar across verbal and nonverbal conditions, $F(1, 309) = .11$, $p = .742$, $\eta_p^2 < .001$.

Desire to Collaborate

As in Experiment 1A, the 3-way interaction between time, confidence, and channel of communication was significant, indicating that changes in the relative desirability of the confident and cautious candidates from Time 1 to Time 2 depended on the channel of communication, $F(1, 309) = 12.46$, $p < .001$, $\eta_p^2 = .039$. It is helpful to unpack this 3-way interaction by examining results at each time of judgment.

At Time 1, participants rated the confident candidate as more desirable than the cautious one in the verbal ($M_{confident}$ = 4.63, $SD_{confident}$ = 1.21; $M_{cautious}$ = 3.39, $SD_{cautious}$ = 1.37), $t(156) = 6.86$, $p < .001$, $d = .96$, and nonverbal ($M_{confident}$ = 4.51, $SD_{confident}$ = 1.42; $M_{cautious}$ = 3.31, $SD_{cautious}$ = 1.38), $t(153) = 6.80$, $p < .001$, $d = .86$, conditions (paired-samples *t*-tests). There was no interaction at Time 1, suggesting the relative difference between the confident and cautious candidates was similar across verbal and nonverbal conditions, $F(1, 309) = .02$, $p = .881$, $\eta_p^2 <$

.001. When choosing between the candidates, 69% of participants in the verbal condition and 71% in the nonverbal condition selected the confident candidate as a collaborator. The tendency to select the confident candidate over the cautious one was significant within each condition, X^2s > 23.70, ps < .001, and was similar in strength across conditions, $X^2(1, N = 311) = .068$, $p = .794$.

At Time 2, the pattern of results depended on channel of communication. Preference for the confident candidate reversed at Time 2 in the verbal condition, in that participants now rated the cautious candidate candidate ($M = 3.31$, $SD = 1.45$) as more desirable than the confident one ($M = 2.89$, $SD = 1.37$), paired-samples t-test: $t(156) = -3.01$, $p = .003$, $d = -.30$. When choosing a collaborator, 62% of participants now chose the cautious candidate, $X^2(1, N = 157) = 9.69$, $p = .002$. In contrast, in the nonverbal condition, the confident candidate ($M = 2.87$, $SD = 1.43$) remained more desirable than the cautious one ($M = 2.64$, $SD = 1.33$), marginally significantly,[5] paired-samples t-test: $t(153) = 1.86$, $p = .064$, $d = .17$. Also, 66% of participants selected the confident candidate as a collaborator, $X^2(1, N = 154) = 14.96$, $p < .001$. The tendency to select the confident candidate over the cautious one was significantly stronger in the nonverbal condition compared to the verbal condition at Time 2, $X^2(1, N = 311) = 24.41$, $p < .001$.

Unlike Experiment 1A, there was only weak directional evidence, not significant, that the confident candidate incurred a larger penalty from Time 1 to Time 2 in the verbal compared to nonverbal conditions without considering the confident candidates' standing relative to the cautious candidate, 2-way interaction $F(1, 309) < 1.0$. With this one exception, the results replicated Experiment 1A with similar sized effects.

Exploratory Analyses

[5] Excluding the participants from analysis who rated the confident candidate as *less* confident than the cautious candidate (i.e. failed the manipulation check; $n = 10$) changes this p-value from .064 to .030.

As in Experiment 1A, we conducted exploratory analyses with the item asking participants how likely it was that they would follow the candidates' leadership. Likelihood of following a candidates' lead was again strongly positively correlated with candidate desirability as a collaborator at each Time, $rs \geq .69$, $ps < .001$. Participants were more likely to want to collaborate with candidates whom they saw as having higher leadership potential.

Experiment 2: Meet the Candidates in Person

Method

Experiment 2 ($N = 256$ undergraduates; preregistered target: $N = 255$, based on expected power and availability of our confederates) replicates the design and procedure of Experiments 1A and 1B with four exceptions: first, participants completed the experiment in a laboratory for course credit and entrance into a drawing for a $50 Amazon Gift Card (instead of a bonus on MTurk) based on performance in the money round. Second, participants were led to believe they would work with someone who was in the next room on the emotion-guessing task money round, rather than simply have their scores averaged. Third, to add more realism to our design, in the nonverbal condition, instead of watching prerecorded videos, participants met the candidates in person, separately, and asked each candidate questions from a list for one minute (e.g., Where are you from?).

Two male confederates (the same actors in Experiment 1A) acted as confident and cautious candidates (counterbalanced). We used male confederates only because of these confederates' availability, and because the similarity in results between Experiments 1A and 1B suggest that our effects were highly consistent across target gender. When acting confident in the nonverbal condition, we coached confederates to hold a straight posture, make frequent and direct eye contact, speak fluidly and at a comfortable volume, and use broad gestures. When

acting cautious in the nonverbal condition, we coached confederates to have a constricted posture, look down, speak quietly and hesitantly, and fidget a little (Anderson et al., 2012; Kennedy et al., 2013; Ridgeway, 1987; Van Zant & Andrade, 2016). The confidence manipulation in the verbal condition was the same as in Experiment 1A.

The fourth difference from Experiment 1A is that instead of learning that all candidates had performed below average on the practice round, participants learned that the candidates had performed *average.* We included this variant to test whether our results held when performance was not as low.

Results

Manipulation Check

Like Experiment 1, according to paired-samples *t*-tests, participants rated the confident candidate as more confident than the cautious one in the verbal ($M_{confident}$ = 2.88, $SD_{confident}$ = .33; vs. $M_{cautious}$ = 1.95, $SD_{cautious}$ = .42), $t(127) = 17.80$, $p < .001$, $d = 2.46$, and nonverbal ($M_{confident}$ = 2.55, $SD_{confident}$ = .56; vs. $M_{cautious}$ = 1.80, $SD_{cautious}$ = .63), $t(127) = 9.09$, $p < .001$, $d = 1.26$, conditions. There was a marginally significant interaction, suggesting that the relative difference between the confident and cautious candidates was slightly larger in the verbal than nonverbal conditions, $F(1, 254) = 3.74$, $p = .054$, $\eta_p^2 = .015$.

Desire to Collaborate

As predicted, in a repeated measures ANOVA, with channel of communication between-subjects, the 3-way interaction between time, confidence, and channel of communication was significant, $F(1, 254) = 26.39$, $p < .001$, $\eta_p^2 = .094$. The 3-way interaction indicates that changes in the relative desirability of the confident and cautious candidates from Time 1 to Time 2

depended on the channel of communication. It is helpful to unpack the 3-way interaction by examining results at each time of judgment.

At Time 1, participants rated the confident candidate as more desirable than the cautious one in the verbal ($M_{confident}$ = 4.39, $SD_{confident}$ = 1.22; $M_{cautious}$ = 3.81, $SD_{cautious}$ = 1.10), $t(127)$ = 3.51, p = .001, d = .50., and nonverbal ($M_{confident}$ = 4.74, $SD_{confident}$ = .98; $M_{cautious}$ = 3.95, $SD_{cautious}$ = 1.25), $t(127)$ = 5.27, p < .001, d = .70, conditions (paired-samples t-tests). There was no interaction between channel of communication and candidate confidence at Time 1, indicating that the relative difference between the confident and cautious candidates was similar across verbal and nonverbal conditions, $F(1, 254)$ = .97, p = .326, η_p^2 = .004. When choosing between the candidates, 60% of participants in the verbal condition and 66% in the nonverbal condition selected the confident candidate as a collaborator. The tendency to select the confident candidate over the cautious one was significant within each condition, X^2s > 5.28, ps < .022, and was similar in strength across conditions, $X^2(1, N = 256)$ = 1.08, p = .300.

At Time 2, the pattern of results depended on channel of communication. Preference for the confident candidate reversed at Time 2 in the verbal condition, in that participants now rated the cautious candidate (M = 4.13, SD = .96) as more desirable than the confident one (M = 3.50, SD = 1.03), paired-samples t-test: $t(127)$ = -5.94, p < .001, d = -.63. When choosing a collaborator, 63% of participants now chose the cautious candidate, $X^2(1, N = 128)$ = 8.00, p = .005. In contrast, in the nonverbal condition, the confident candidate (M = 4.33, SD = 1.05) remained more desirable than the cautious one (M = 3.95, SD = 1.16), paired-samples t-test: $t(127)$ = 3.07, p =.003, d = .34. Also, 65% of participants selected the confident candidate as a collaborator, $X^2(1, N = 128)$ = 11.28, p = .001. The tendency to select the confident candidate

over the cautious one was significantly stronger in the nonverbal condition compared to the verbal condition at Time 2, $X^2(1, N = 256) = 19.15$, $p < .001$.

We also investigated whether the confident candidate in the verbal condition was punished more severely, in terms of experiencing a more severe drop in ratings from Time 1 to Time 2, than the confident candidate. The negative slope of the line from Time 1 to Time 2 for the confident person in the verbal condition was indeed steeper than in the nonverbal condition, 2-way interaction $F(1, 254) = 17.68$, $p < .001$, $\eta_p^2 = .065$. Thus, the confident candidate incurred a larger penalty from Time 1 to Time 2 in the verbal compared to nonverbal conditions even without considering the confident candidates' standing relative to the cautious candidate. Thus, the results replicate the key results of Experiments 1A and 1B.

Experiment 3: Overt Denials of Confidence

Experiments 1A, 1B, and 2 demonstrated that the channel of communication moderated the reputational consequences of overconfidence. Confidence was initially advantageous (prediction 1) for both verbal and nonverbal overconfidence, but then had different effects after performance feedback revealed performance was low, depending on the channel of communication (prediction 2a). Experiment 3 investigates why the channel of communication had this moderating effect by directly testing the *plausible deniability hypothesis*. According to this hypothesis, channel of communication is important because expressions of overconfidence in the nonverbal condition can be more plausibly denied (e.g., they are "noisier" and more ambiguous) than expressions of overconfidence in the verbal condition. Thus, after performance feedback, explicit denials of earlier confidence should be more plausible if they were originally made in the nonverbal than verbal channel (prediction 2b). Experiment 3 tests this prediction by

measuring the believability of explicit denials of confidence, following verbal versus nonverbal expressions of confidence.

Method

Participants completed this experiment on MTurk (N = 462). The preregistered sample size was 442, based on 85% power, η_p^2 = .02, for the predicted three-way interaction; as before, the vagaries of MTurk signups left us with more valid responses than we had requested. We excluded no responses.

The materials and procedure were identical to Experiment 1A with two exceptions. First, immediately following the revelation that the candidates had performed poorly on the emotion-guessing practice round, participants read an overt denial. They read, "When Micah and Jason learned how they performed on the emotion-guessing practice round, they both said, 'That's what I expected.' Both candidates claimed that they had never been confident in their emotion-guessing ability." Participants then rated, "*How credible is each candidates' reaction,*" and "*How much do you trust each candidate (in general),*" on scales from 1 (*not at all*) to 6 (*very much*); Spearman-Brown inter-item reliability for the confident candidates was r = .65, p < .001, and for cautious candidates, r = .54, p < .001. As specified in the preregistration document, these variables were averaged to form a believability index (because they were correlated higher than r = .5). The second difference from Experiment 1A was that the materials did not include exploratory questions about leadership.

Results

Manipulation Check

According to paired-samples t-tests, participants rated the confident candidate as more confident than the cautious one in the verbal ($M_{confident}$ = 2.44, $SD_{confident}$ = .70; vs. $M_{cautious}$ =

1.43, $SD_{cautious}$ = .54), $t(233) = 16.25$, $p < .001$, $d = 1.62$, and nonverbal ($M_{confident}$ = 2.31, $SD_{confident}$ = .74; vs. $M_{cautious}$ = 1.33, $SD_{cautious}$ = .52), $t(228) = 17.75$, $p < .001$, $d = 1.53$, conditions. There was no significant interaction between channel of communication and candidate confidence, suggesting that the relative difference between the confident and cautious candidates was similar in the verbal and nonverbal conditions, $F(1, 461) = .098$, $p = .755$, $\eta_p^2 < .001$.

Plausible Deniability

As predicted, explicit denials of overconfidence were more plausible following expressions of nonverbal overconfidence compared to verbal. The confident candidate in the nonverbal condition was rated as more believable (i.e., the denial of confidence was more credible and the candidate more trustworthy; $M = 3.63$, $SD = 1.12$) than the confident candidate in the verbal condition ($M = 2.33$, $SD = 1.26$), independent-samples *t*-test: $t(461) = 11.73$, $p < .001$, $d = 1.09$.

We also explored the believability of candidates' denials of overconfidence following nonverbal and verbal expressions of *lacking* confidence. In this case, lacking confidence, expressed nonverbally, would still have more plausible deniability than lacking confidence expressed verbally, but the advantage of plausible deniability is reversed (i.e., the advantage would go to the cautious candidate in the verbal condition, who was unequivocally cautious in their performance). Consistent with this expectation, the cautious candidate in the verbal condition, who had verbally denied being confident regarding his performance, was viewed as more believable ($M = 4.98$, $SD = 1.10$) than the corresponding cautious candidate in the nonverbal condition, who had expressed lack of confidence nonverbally only ($M = 4.05$, $SD = 1.05$), independent-samples *t*-test: $t(461) = 9.31$, $p < .001$, $d = .86$.

Desire to Collaborate (Replication of Experiment 1A)

As predicted, in a repeated measures ANOVA, with channel of communication between-subjects, the 3-way interaction between time, confidence, and channel of communication was significant, $F(1, 461) = 84.74$, $p < .001$, $\eta_p^2 = .155$. The 3-way interaction indicates that changes in the relative desirability of the confident and cautious candidates from Time 1 to Time 2 depended on the channel of communication. The pattern of results at each time of judgment closely replicated Experiment 1A.

Experiment 4: Confidence is Attached or Unattached to Claims

Experiment 3 showed that overt denials of overconfidence from a person who expressed confidence nonverbally were in fact more plausible than denials of overconfidence from a person who expressed confidence verbally. These findings suggest that nonverbal overconfidence might lead to fewer social costs, once overconfidence is exposed, because of plausible deniability. Experiment 4 again examined why the channel of communication moderated the effects of overconfidence after overconfidence was exposed. We investigated two possibilities. First, people might view nonverbally expressed confidence as so attractive that they even forgive such confidence when it is unjustified. Confidence is socially valued, and people are encouraged to act confidently in many areas of life (Fritz, Brown, Lunde, & Banset, 2005; Howell & Costley, 2006). Therefore, it is possible that people view overconfidence as a "forgivable sin," or a bias that brings about many benefits even if it can lead to flawed judgments at times. The second possibility is that nonverbal overconfidence remains beneficial simply because it is harder to attach to a falsifiable claim (the *plausible deniability hypothesis*). Verbal statements of confidence such as "I'm 100% confident in my judgment" tend to be more specific to a particular claim, and thus more easily falsified. By contrast, nonverbal overconfidence such as expansive

postures, eye contact, and a loud voice, tends to reflect a more general expression of confidence in one's overall abilities, thus making it more difficult to evaluate as appropriate or inappropriate.

To test this idea, we designed Experiment 4 to manipulate plausible deniability. In Experiments 1A, 1B, 2, and 3, we posit that potential collaborators who expressed confidence nonverbally were able to take advantage of plausible deniability by acting confident in their general demeanor rather than about specific claims that could be disproved. A way to test whether plausible deniability is important is to take it away: eliminate some of the ambiguity and the noisiness in nonverbal communication by clarifying what the nonverbal confidence refers to. We varied the association between nonverbal expressions and specific claims that could be shown to be incorrect. (Even though nonverbal behavior typically is characterized by relatively high plausible deniability, it is of course possible to reduce it.)

Participants in all conditions watched identical videos of potential collaborators expressing the exact same nonverbal behaviors. What differed was whether their nonverbal behavior was attached to specific performance feedback or not. If the pattern of findings differs depending on whether nonverbal confidence is attached to specific verifiable performance outcomes, it would suggest that the social benefits of nonverbal overconfidence arise because it is typically more difficult to pinpoint nonverbal behavior as overconfident. These findings would support the *plausible deniability hypothesis*. In contrast, if the pattern of findings does not differ—if the effects of nonverbal overconfidence are the same regardless of whether expressions of nonverbal confidence are tied to specific, verifiable outcomes, this would suggest that people view nonverbal confidence as so socially attractive that they forgive individuals whose confidence is unjustified.

Method

Participants

Five-hundred-seventy-one participants completed this experiment on MTurk. Our preregistered research plan called for the exclusion of participants who failed the confidence manipulation check question or had a duplicate IP address. The preregistered target sample size was 522, and so we advertised for 570 in case there were many exclusions. Excluding participants (n = 34 who failed the confidence manipulation check, and n = 1 duplicate IP address) did not affect the significance or direction of any results except one noted below. The results are otherwise reported excluding those participants (N = 536).

Design and Procedure Overview

The experiment had a 2 time (Time 1: before performance information vs. Time 2: after performance information, within subjects) x 2 confidence (confident vs. cautious candidate, within subjects) x 2 attached (confidence is attached vs. unattached to performance information, between subjects) mixed design. In this design, all participants saw candidates who expressed their confidence or cautiousness nonverbally; there were no verbal conditions. Participants either watched two candidates (confident and cautious) whose confidence was attached or two candidates (confident and cautious) whose confidence was unattached to their performance. The order of who came first (the confident or cautious candidate) and which actor played each candidate was counterbalanced.

As in Experiment 1, participants chose to collaborate with one of two candidates on an emotion-guessing task, in which participants looked at photos of faces and guessed the emotion displayed. For each emotion guessed correctly, participants earned entry into a drawing for a $25 bonus. Participants first completed a practice round consisting of ten emotion-guessing

problems and were led to believe that two fellow participants had previously completed the same practice round as well as an unrelated task (i.e., rating products online). Then participants ranked which information they would most want to have, out of five options, to help them evaluate the two candidates (e.g., watch the candidates complete the emotion-guessing practice round; watch the candidates rate products online). The purpose of this question was to help participants notice whether the candidates' confidence displayed in the upcoming videos was indeed attached to performance information versus unattached. Then participants were randomly assigned to watch videos of the candidates ostensibly completing the emotion-guessing practice round (attached condition) or rating products online (unattached condition). All participants watched the same videos. First, a candidate introduced himself by saying, e.g., "Hi, I'm David." Then, the candidate sat at a table and acted confident (or not) while answering questions on an iPad. After watching the videos (about 20 seconds each), participants answered questions about what the candidates were doing in the videos (open text box; unscored) and the manipulation check of who had been more confident (a binary choice) in his emotion-guessing ability (attached condition) or in general (unattached condition). Participants then evaluated the candidates as potential collaborators (Time 1 judgments) using the same dependent measures as in Experiments 1-2.

Next, participants learned how well each candidate had performed on the practice round, and so the candidates' confidence displayed in the video was directly related to this performance information (attached condition) or not (unattached condition), depending on condition. Participants then reevaluated the candidates (Time 2 judgments). Finally, participants completed the money round, and their scores were averaged with the selected candidates' score to determine payment.

Confidence and Attachment Manipulations

Two male actors around the age of 30 who had not assisted with our other experiments acted the part of the confident and cautious candidates and completed the emotion-guessing task so that their score could be combined with the participants' score if they were chosen as the collaborator.

In the *attached* condition, participants were told that the actor in the video was completing the emotion-guessing practice round; that way, the candidates' behaviors and expressions of confidence were related to his practice round performance. In the *unattached* condition, participants were told that the actor was rating products online. That way, the candidates' behaviors and expressions of confidence were unrelated to his performance on the emotion-guessing practice round; how he behaved was described to participants as a reflection of his confidence in general.

In the video of the *confident* candidate, the candidate nodded his head as he answered questions on the iPad for about 20 seconds. He moved his finger to the screen and back in fluid motions. In the video of the *cautious* candidate, the candidate moved his head from side to side deliberatively as he answered questions on the iPad, also for about 20 seconds. He moved his finger to the screen and back slowly, sometimes hesitating. See Appendix A. Which task the candidates were completing and how to interpret the candidates' behaviors were reiterated throughout the survey to increase the power of the manipulation.

Performance Information

After making Time 1 judgments, participants received more information. They learned how each candidate had performed on the practice round: below average; therefore, performance was equally poor across the candidates.

Participants made the same Time 1 (before performance information) and Time 2 (after performance information) judgments as in Experiments 1-2, without the exploratory question about leadership.

Manipulation Check Questions

To determine whether participants were paying attention, participants answered: "Based on their nonverbal behaviors, which of the two candidates is *a more confident person in general/ more confident in his emotion-guessing ability*?)" in the unattached versus attached conditions, respectively (binary choice).

Results

There were no consistent significant effects of order or actor, so we do not consider these variables further.

Manipulation Checks

Thirty-four participants (6%) failed the confidence manipulation check of which candidate had exhibited more confidence. These participants were distributed equally across attached and unattached conditions (*n*s = 16 vs. 18, respectively). Including these participants did not affect the direction of results; however, it did affect significance for one simple effect, noted below. Results are otherwise reported in accordance with the preregistered analysis plan (i.e., excluding these participants from analyses).

Desire to Collaborate

As predicted, in a repeated measures ANOVA, with attachment between-subjects, the 3-way interaction between time, confidence, and attachment was significant. The 3-way interaction indicates that changes in the relative desirability of the confident and cautious candidates from Time 1 to Time 2 depended on whether confidence was attached to the performance information,

$F(1, 534) = 37.30$, $p < .001$, $\eta_p^2 = .065$. It is helpful to unpack the 3-way interaction by examining results at each time of judgment.

At Time 1, participants rated the confident candidate as more desirable than the cautious one in the attached ($M_{confident} = 4.88$, $SD_{confident} = 1.10$; $M_{cautious} = 2.99$, $SD_{cautious} = 1.22$), $t(266) = 17.27$, $p < .001$, $d = 1.65$, and unattached ($M_{confident} = 4.80$, $SD_{confident} = 1.06$; $M_{cautious} = 3.35$, $SD_{cautious} = 1.31$), $t(268) = 12.44$, $p < .001$, $d = 1.21$, conditions (paired sample *t*-tests). There was evidence of an interaction suggesting that the relative difference between the desirability of the confident and cautious candidates was larger in the attached than unattached conditions, $F(1, 534) = 7.78$, $p = .005$, $\eta_p^2 = .014$. When choosing between them, 83% of participants in the attached condition and 77% in the unattached condition selected the confident candidate as a collaborator. The tendency to select the confident candidate over the cautious one was significant within each condition, X^2s > 80.33, *p*s < .001, and was similar in strength across conditions, $X^2(1, N = 536) = 2.49$, $p = .115$.

At Time 2, the pattern of results diverged further depending on attachment. In the attached condition, there was a reversal in the pattern at Time 2. Participants now rated the cautious candidate ($M = 3.00$, $SD = 1.36$) as slightly more desirable than the confident one ($M = 2.84$, $SD = 1.36$), although this difference was not statistically significant, paired-samples *t*-test: $t(266) = -1.58$, $p = .114$, $d = -.12$. (Including participants in the sample who had failed the manipulation check question increases the size of the effect a little, affecting significance, paired-samples *t*-test: $t(281) = -1.97$, $p = .049$, $d = -.14$). When choosing a collaborator, 53% of participants now chose the cautious candidate, $X^2(1, N = 267) = 1.08$, $p = .298$. We suspect the reversal was less pronounced in this condition compared to Experiments 1-2 in part because of the stronger initial desirability of the confident candidate relative to the cautious one at Time 1.

In contrast, in the unattached condition, the confident candidate (M = 3.23, SD = 1.39) remained more desirable than the cautious one (M = 2.82, SD = 1.19), paired-samples t-test: $t(268) = 4.53$, $p < .001$, $d = .32$. Also, 63% of participants selected the confident candidate as a collaborator, $X^2(1, N = 269) = 17.70$, $p < .001$. The tendency to select the confident candidate over the cautious one was significantly stronger in the unattached condition compared to the attached condition at Time 2, $X^2(1, N = 536) = 13.87$, $p < .001$.

We also investigated whether the confident candidate in the attached condition suffered a larger drop in desirability ratings than the confident candidate in the unattached condition from Time 1 to Time 2. The negative slope of the line from Time 1 to Time 2 for the confident person in the attached condition was indeed steeper than in the unattached condition, 2-way interaction $F(1, 534) = 15.37$, $p < .001$, $\eta_p^2 = .028$. Thus, the confident candidate incurred a larger penalty from Time 1 to Time 2 in the attached compared to unattached conditions even without considering the confident candidates' standing relative to the cautious candidate.

Thus, this study supports the *plausible deniability hypothesis*. Although confidence was advantageous to a candidate initially, it was no longer beneficial if the candidate's confidence turned out to be unjustified, exposing the candidate's confidence to be overconfidence. Confidence that was not clearly attached to performance, on the other hand, remained beneficial, even after poor task performance was revealed.

Experiment 5: Comparing Nonverbal and Mixed Channels

Experiment 5 again explores why the channel of communication moderated the effects of overconfidence, using a different paradigm, in which participants evaluate advisors instead of choosing potential collaborators. There is a rich tradition of employing advisor paradigms (and other types of informants) when studying confidence and overconfidence (Bradfield & Wells,

2000; Radzevick & Moore, 2011; Sporer et al., 1995; Van Swol & Sniezek, 2005; Yates et al., 1996; Zalesny, 1990). Therefore, we employed this design feature so that it could speak to and build from the voluminous literature using the judge-advisor paradigm. We expect the *plausible deniability hypothesis* to operate similarly in this paradigm as in Experiments 1 through 4.

In Experiment 5, participants acted as managers and evaluated advisors who gave advice via recorded video. Like Experiment 4, Experiment 5 utilizes *attached* and *unattached* nonverbal conditions. Experiment 5 also includes a *mixed channel* condition (instead of a verbal-only condition, as in Experiments 1-3). The benefit of combining verbal and nonverbal information (to compare to nonverbal-only) in a *mixed channel* is that we can explore one potential alternative explanation for the findings in Experiments 1-3; namely, it is possible that the target who exhibited confidence verbally became less desirable than the corresponding target who exhibited cautiousness verbally once performance was revealed (i.e., a cross-over interaction) simply because there was a dearth of information other than the written text. In Experiment 5, we investigate whether there is a cross-over interaction even when there is additional, rich information available such as the advisors' appearances on video. (The results of Experiment 4, the *attached* condition, reveal a cross-over interaction pattern similar to the verbal condition in Experiments 1 through 3, which suggests that even with richer stimulus materials the cross-over pattern can occur. However, Experiment 4 lacked a condition in which verbal or mixed channel overconfidence occurred.).

A second benefit of the design of Experiment 5 is that in the *mixed-channel* and *nonverbal-attached* conditions, expressions of confidence are clearly attached to advisors' decisions rather than their overall task performance (thereby clarifying the meaning of the behaviors and reducing plausible deniability if the decisions turn out badly). We compare these

conditions to a *nonverbal-unattached* condition, in which participants watch the videos of the advisors discussing the decisions with no sound, so that the advisors' confident and cautious behaviors reflect their general demeanor. In this condition, the advisors enjoy a higher degree of plausible deniability if it turns out their decision performance is poor; the penalty for their poor decision performance should be dampened.

A third facet of Experiment 5 is that we measure participants' perceptions of advisors' confidence in the task at hand specifically, in addition to how confident the advisors seem in general. This measure helped address an alternative explanation for our prior findings: Namely, it was possible that participants never viewed nonverbally confident targets as being overconfident in the task at hand. Rather, they simply viewed those targets as being confident in general, and therefore, there was no overconfidence to deny. In other words, nonverbally confident targets might have simply been viewed as being generally confident, but not confident in the task specifically, and therefore not overconfident in the task specifically. In Experiment 5, by measuring participants' views of targets' confidence in the task at hand, we can address this possibility. If the confident advisor in the *nonverbal-unattached* condition is rated as more confident in the task at hand than the cautious advisor, this supports our *plausible deniability* account because it suggests participants infer overconfidence even in unattached conditions.

Therefore, Experiment 5 compares *mixed-channel*, *nonverbal-attached*, and *nonverbal-unattached* conditions and tests several predictions. According to the *plausible deniability hypothesis*, confidence will be advantageous initially in all conditions (prediction 1), and confidence will incur a greater social cost in the *mixed-channel* condition than the *nonverbal-unattached* condition after poor performance is revealed (prediction 2a). The hypothesis also implies that the *mixed-channel* and *nonverbal-attached* conditions would have similar patterns of

results—a strong penalty for overconfidence once exposed (prediction 3). Following this same logic, *nonverbal-attached* and *nonverbal-unattached* conditions should differ in that poor performance will be more damaging when confidence is clearly attached rather than unattached (or ambiguously attached) to it (as in Experiment 4). When people can recognize it, and plausible deniability is low, overconfidence can be damaging to reputations.

Method

Participants

Three-hundred-two participants (101 women, 201 men; *Mdn age* = 21.5) completed this experiment at a university for course credit. We posted timeslots with the goal of running 300 participants and ran 302.

Design and Procedure Overview

The experiment had a 2 time (Time 1: before decision performance information vs. Time 2: after decision performance information, within subjects) x 2 confidence (confident vs. cautious candidate, within subjects) x 3 channel (mixed vs. nonverbal-attached vs. nonverbal-unattached, between subjects) mixed design. Two male actors who had not assisted with our other experiments played the parts of the confident and cautious advisors (see Appendix B). One actor was European American and the other was South Asian American. Their roles were counterbalanced.

Participants played the role of managers at a company and evaluated two employees advising them. Participants learned that the advisors' job was to provide dependable, correct information to the manager. To reinforce comprehension, participants described the advisors' responsibilities in their own words. Next, participants learned that, in separate meetings, each advisor had been asked to make two decisions related to their area of specialization. Participants

saw video clips of advisors recommending different courses of action for the two decisions. They evaluated the advisors before (Time 1) and after (Time 2) learning the outcomes of the decisions.

The order of who came first, the confident or cautious advisor, was counterbalanced, as was the actor who played each advisor and details like the advisors' area of specialization.

Confidence and Channel Manipulations

All participants watched 5-second video clips of the advisors stating their decisions. In one video, Pat made two decisions about whether to add two additional product lines. Pat said, "We will add Product line A. We will add Product line B," and in another, Morgan made two decisions about whether to add two additional clients. Morgan said, "We will add the client Catapult. We will add the client Logit." The confident advisor expressed confidence in both decisions. The cautious advisor was confident about one decision but cautious about the other. In the nonverbal-unattached condition, participants watched the videos of the advisors making these decisions with no sound.

The advisors used different vocal tones and body language to convey their level of confidence when they spoke about each decision. For example, when discussing a decision they felt confident about, they used a strong, unwavering voice, and when discussing a decision they felt cautious about, they hesitated and acted unsure. Therefore, with the sound on, in the attached conditions in Experiment 5, the advisors' nonverbal expressions of confidence could be linked to their decision performance (i.e., whether the decisions they made were good ones) when performance was revealed at Time 2. In the nonverbal-unattached condition, with no sound, it was not obvious that the expressions of confidence were attached to specific decisions. In the *mixed channel* condition, in addition to stating their decisions in the video (with

accompanying nonverbal confidence or lack thereof), the advisors also stated their confidence in their decisions explicitly in written text (e.g., the survey materials stated that, "Off-camera, Morgan says that he is 'confident' about the first decision and is 'confident' about the second"), but in the *nonverbal-only* conditions, the advisors never stated their confidence in their decisions explicitly.

Time 1 Judgments

Participants answered two questions about each advisor to assess his competence at the job (i.e., "How good is this person at the job") from 1 *(not good at all)* to 6 *(extremely good)* and, "How much do you trust this person to do a good job" from 1 *(do not trust at all)* to 6 *(trust completely).* The items were highly correlated (Spearman-Brown inter-item reliability for the confident and cautious advisors, respectively, rs > .69, ps < .001) and were averaged. Then participants selected which person they thought was better at the job and described why they chose him.

Overconfidence Information

Next, participants received information about the advisors' actual performance. Each advisor had been right about one decision (it was a great addition to the company and made money) and wrong about another (it was a huge failure causing lost revenue and bad press). Therefore, decision quality was equal across advisors.

Time 2 Judgments

After receiving the information about advisors' decision performance, participants again answered the same questions as they had at Time 1. They also answered an additional question at the end of the survey to assess whom they would believe about a future decision.

As manipulation checks, participants rated "How confident was *Pat/Morgan* about the first two decisions?" and "How confident was *Pat/Morgan* in general?" on scales from 0 *(not at all confident)* to 6 *(very confident).* Again, the first item allowed us to establish that participants in the unattached overconfident condition viewed the advisor as overconfident in the task at hand (and not only in general).

Results

Analyses revealed no consistent significant main or interaction effects of actor or order. Four participants reported that their video did not load properly. Excluding their data does not materially affect the direction or significance level of the results, so we included their data.

Manipulation Checks

Participants rated the confident advisors as more confident in their decisions, and in general, than the cautious ones in the mixed channel, nonverbal-attached, and nonverbal-unattached conditions, paired-samples *t*-tests: *t*s > 14.0, *p*s < .001. Thus, the manipulation checks revealed successful manipulations of confidence.[6] Of particular importance, this pattern

[6] There were differences in ratings of the confident advisor's confidence in his decisions across conditions (M_{mixed} = 5.47, SD_{mixed} = .97; $M_{nonverbal\text{-}attached}$ = 5.32, $SD_{nonverbal\text{-}attached}$ = 1.13; $M_{nonverbal\text{-}unattached}$ = 4.91, $SD_{nonverbal\text{-}unattached}$ = .96), $F(1, 298) = 8.08$, $p < .001$, $\eta_p^2 = .051$. LSD posthoc tests revealed that the mixed channel and nonverbal-attached conditions did not significantly differ ($M_{difference}$ = .16, SE = .15, p = .280), but the confident advisor in the nonverbal-unattached condition was rated as less confident in his decisions than the other two (compared to mixed-channel: $M_{difference}$ = -.56, SE = .14, $p < .001$; compared to nonverbal-attached: $M_{difference}$ = -.40, SE = .14, p = .005). The cautious advisor was rated marginally significantly differently across conditions (M_{mixed} = 3.02, SD_{mixed} = 1.08; $M_{nonverbal\text{-}attached}$ = 3.01, $SD_{nonverbal\text{-}attached}$ = 92; $M_{nonverbal\text{-}unattached}$ = 3.31, $SD_{nonverbal\text{-}unattached}$ = 1.01), $F(1, 298) = 2.93$, p = .055, η_p^2 = .019. We explored whether these differences in the overall confidence expressed within each condition affected the results; however, unlike Experiments 1-2, this experiment asked about confidence in specific decisions rather than just confidence in general. One could reasonably expect differences in confidence in the specific decisions to matter. Confidence that is specifically about the decisions is one way to capture the degree of plausible deniability, with high confidence in the decisions signifying low plausible deniability.

We reran all desirability analyses of 3-way and 2-way interactions with the manipulation check ratings of the confident and cautious candidates' confidence in their decisions as covariates. Controlling for confidence in decisions does seem to explain some variance in the 3-way interactions. Specifically, the moderating effect of advisor confidence (i.e., being confident versus cautious) on the relationship between time (before versus after performance is revealed) and competence at the job had been significantly larger in the mixed channel than nonverbal unattached conditions; however, this effect is reduced and becomes not significantly different when including the covariates, from η_p^2 = .019, p = .050, to η_p^2 = .006, p =.269. The corresponding effect in the same model with nonverbal-attached and nonverbal-unattached conditions is also reduced, from η_p^2 = .073, $p < .001$, to η_p^2

of results held up even in the nonverbal-unattached condition, wherein participants viewed the confident advisor as significantly more confident in his decisions ($M_{nonverbal\text{-}unattached}$ = 4.91, $SD_{nonverbal\text{-}unattached}$ = .96) than the cautious advisor in his decisions ($M_{nonverbal\text{-}unattached}$ = 3.31, $SD_{nonverbal\text{-}unattached}$ = 1.01), $t(102) = 14.05$, $p < .001$, $d = 1.62$. This suggests that even when advisors exhibit a confident general demeanor, participants still view that advisor as being more confident in the task at hand.

There was an interaction such that the difference in ratings of the confident and cautious advisors' confidence in their decisions was smaller in the nonverbal-unattached condition than in the other conditions, $F(2, 298) = 11.93$, $p < .001$, $\eta_p^2 = .074$, which would be expected because in the nonverbal-unattached condition, the participants were not explicitly told that advisors' confidence was attached to advisors' decisions. Still, the large difference between ratings of the confident and cautious advisors' confidence in their decisions even in the nonverbal-unattached condition suggests that participants were likely still attaching some of the advisors' nonverbal confidence to advisors' confidence in the specific decisions. There was no corresponding interaction with advisors' confidence in general, $F(2, 298) = .72$, $p = .490$, $\eta_p^2 = .005$, indicating

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= .040, $p = .005$. The omnibus, across all three conditions, is also reduced somewhat, from $\eta_p^2 = .049$, $p = .001$, to $\eta_p^2 = .035$, $p = .005$. Thus, the results were likely driven at least in part by differences in confidence in specific decisions across conditions.

As for confidence in general, rather than in specific decisions, the confident advisor was rated only marginally significantly differently across conditions in his confidence in general (M_{mixed} = 5.28, SD_{mixed} = 1.09; $M_{nonverbal\text{-}attached}$ = 5.24, $SD_{nonverbal\text{-}attached}$ = 1.14; $M_{nonverbal\text{-}unattached}$ = 4.95, $SD_{nonverbal\text{-}unattached}$ = .92), $F(1, 298) = 2.90$, $p = .057$, $\eta_p^2 = .019$. The cautious advisor was not rated significantly differently across conditions in his confidence in general (M_{mixed} = 3.36, SD_{mixed} = 1.00; $M_{nonverbal\text{-}attached}$ = 3.20, $SD_{nonverbal\text{-}attached}$ = 1.10; $M_{nonverbal\text{-}unattached}$ = 3.14, $SD_{nonverbal\text{-}unattached}$ = .99) $F(1, 298) = 1.25$, $p = .288$, $\eta_p^2 = .008$. Adding confidence in general as covariates does not reduce the effect as much as confidence in the decisions. The moderating effect of advisor confidence (i.e., being confident versus cautious) on the relationship between time (before versus after performance is revealed) and competence at the job had been significantly larger in the mixed channel than nonverbal unattached conditions; this effect is reduced just a little, from $\eta_p^2 = .019$, $p = .050$, to $\eta_p^2 = .013$, $p = .104$. The corresponding effect in the same model with nonverbal-attached and nonverbal-unattached conditions is also reduced just a little, from $\eta_p^2 = .073$, $p < .001$, to $\eta_p^2 = .064$, $p < .001$. The omnibus, across all three conditions, is also reduced just a little, from $\eta_p^2 = .049$, $p = .001$, to $\eta_p^2 = .042$, $p = .002$.

that nonverbal confidence was seen as being similarly representative of advisors' general demeanor in all three conditions.

Competence at the Job

The 3-way interaction between time, confidence, and channel of communication was significant, indicating that changes in the relative competence of the confident and cautious advisors from Time 1 to Time 2 depended on the channel of communication, $F(2, 297) = 7.62$, $p = .001$, $\eta_p^2 = .049$. It is helpful to unpack this 3-way interaction by examining results at each time of judgment.

At Time 1, participants rated the confident advisor as more competent than the cautious one in mixed channel ($M_{confident} = 4.25$, $SD_{confident} = 1.03$; $M_{cautious} = 3.45$, $SD_{cautious} = 1.03$), $t(96) = 5.44$, $p < .001$, $d = .78$, nonverbal-attached ($M_{confident} = 4.62$, $SD_{confident} = 1.03$; $M_{cautious} = 3.31$, $SD_{cautious} = 1.09$), $t(99) = 8.94$, $p < .001$, $d = 1.2$, and nonverbal-unattached ($M_{confident} = 4.44$, $SD_{confident} = .90$; $M_{cautious} = 3.67$, $SD_{cautious} = .91$), $t(102) = 6.79$, $p < .001$, $d = .85$, conditions (paired-samples *t*-tests). When choosing between them, 71% of participants in the mixed channel condition, 83% in the nonverbal-attached condition, and 73% in the nonverbal-unattached condition selected the confident advisor as being better at the job. See Figure 2. The tendency to select the confident candidate over the cautious one was significant within each condition, X^2s > 17.33, ps < .001, and was similar in strength across conditions, $X^2(2, N = 301) = 4.63$, $p = .099$.

At Time 2, as would be expected, the pattern of results diverged depending on attachment. In the mixed channel condition, there was a reversal in the pattern at Time 2, and participants now rated the cautious advisor ($M = 3.49$, $SD = 1.02$) as being better at the job than the confident one ($M = 3.14$, $SD = .98$), paired-samples *t*-test: $t(96) = -2.82$, $p = .006$, $d = -.35$.

When choosing between them, 58% of participants selected the cautious advisor, $X^2(1, N = 97) = 2.32$, $p = .128$, and when choosing who was right about the additional decision, 68% selected the cautious advisor, $X^2(1, N = 97) = 12.63$, $p < .001$. Likewise, in the nonverbal-attached condition, participants rated the cautious advisor ($M = 3.45$, $SD = 1.11$) as being better at the job than the confident one ($M = 3.22$, $SD = 1.04$), marginally significantly, paired-samples *t*-test: $t(100) = -1.71$, $p = .090$, $d = -.21$. When choosing between them, 55% of participants selected the cautious advisor, $X^2(1, N = 101) = .81$, $p = .371$, and when choosing who was right about the additional decision, 62% selected the cautious advisor, $X^2(1, N = 101) = 6.19$, $p = .013$. In contrast, in the nonverbal-unattached condition, there was no clear reversal on any metric, and the confident advisor ($M = 3.50$, $SD = .79$) was rated about as competent as the cautious one ($M = 3.53$, $SD = .75$), paired-samples *t*-test: $t(102) = -.476$, $p = .635$, $d = -.04$. When choosing between them, 56% of participants selected the confident advisor, $X^2(1, N = 103) = 1.64$, $p = .200$, and 57% thought the confident advisor was right about the additional decision, $X^2(1, N = 103) = 2.18$, $p = .139$. The tendency to select the confident advisor as being better at the job than the cautious one, and to select the confident advisor as being more likely to be right about the additional decision than the cautious one, was stronger overall in the nonverbal-unattached condition than the mixed channel and nonverbal-attached conditions, $X^2(2, N = 301) = 4.37$, $p = .113$ and $X^2(2, N = 301) = 14.60$, $p < .001$, for the selection of being better at the job and more likely to be right about the additional question, respectively.

Exploring the 3-way interactions among the different combinations of conditions confirms the simple comparisons. In a repeated measures ANOVA, with channel of communication between subjects, the pattern of results in the mixed channel condition was different from the nonverbal-unattached condition, 3-way interaction: $F(1, 198) = 3.87$, $p = .050$,

η_p^2 = .019, replicating Experiments 1-3; likewise, the pattern of results in the nonverbal-attached condition was different from the nonverbal-unattached condition, $F(1, 201) = 15.74$, $p < .001$ η_p^2 = .073, replicating Experiment 4. Thus, attachment to performance likely played a role in shaping whether overconfidence was beneficial.

We also investigated whether the confident advisor in the mixed and nonverbal-attached conditions was rated differently from the confident advisor in the nonverbal-unattached condition in terms of competence at the job. The negative slope of the line from Time 1 to Time 2 for the confident advisor in the attached conditions (mixed channel and nonverbal-attached combined) was indeed steeper than in the nonverbal-unattached condition, 2-way interaction $F(1, 314) = 7.33$, $p = .007$, $\eta_p^2 = .023$. The negative slope of the line from Time 1 to Time 2 for the confident advisor in the nonverbal-attached condition was also steeper than in the nonverbal-unattached condition, 2-way interaction $F(1, 202) = 10.17$, $p = .002$, $\eta_p^2 = .048$. Thus, the confident advisor incurred a larger penalty from Time 1 to Time 2 in the attached compared to unattached conditions even without considering the confident advisors' standing relative to the cautious advisor.

General Discussion

Is overconfidence socially beneficial for the individual, even in the presence of performance information? Prior research on this question has provided discrepant answers. The current research suggests that these discrepancies can be explained by understanding the moderating role of the channel through which confidence is expressed and the plausible deniability of that confidence expression.

In Experiments 1 and 2, once participants learned of potential collaborators' performance and could compare their confidence to that performance, participants sanctioned candidates who

had expressed overconfidence verbally by evaluating them less positively and avoiding them as collaborators. But participants did not sanction candidates who had expressed their confidence nonverbally. Experiments 3, 4, and 5 investigated why the channel of communication mattered. Experiment 3 showed the same pattern of results as Experiments 1 and 2, but also included evidence that an explicit, overt denial of overconfidence from a person who expressed confidence nonverbally was indeed more plausible than a denial of overconfidence from a person who expressed confidence verbally. In Experiment 4, the same nonverbal expressions of confidence led to different social outcomes depending on whether the expression of confidence preserved plausible deniability—i.e., whether the confidence had been directly attached or unattached to performance. Thus, nonverbal overconfidence did not always receive a "free pass." In Experiment 5, advisors expressed overconfidence in mixed channel or nonverbal-only conditions. The rate at which participants socially sanctioned an advisor for being overconfident was greater when that advisor was overconfident about his decisions than when the advisor was overconfident in general demeanor. Experiment 5 adds further support for the idea that the channel of communication of overconfidence matters because of the degree of attachment to discredited claims; in other words, because of plausible deniability.

Overall, the current results provide support for the *plausible deniability hypothesis*; they suggest that expressions of confidence will lead to negative social consequences if behaviors are interpreted as undeniable (or hard-to-deny) manifestations of overconfidence. If observers suspect that people are exhibiting bias rather than engaging in objective, rational reasoning, they reduce trust in those people as collaborators or advisors. However, compared to explicit verbal claims of self-assurance, overconfidence is typically harder to detect with certainty when it is expressed nonverbally. For example, a loud, assertive voice might be a dispositional cue from a

generally capable person and not an indication of overconfidence in a specific claim (Judge, Bono, Ilies, & Gerhart, 2002). This ambiguity in meaning has been described as a distinguishing feature of nonverbal behavior more generally (e.g., DePaulo, 1992; Keating, 2016). If nonverbal cues are not clearly tied to specific claims that could be disproved, and plausible deniability is preserved, nonverbal overconfidence is likely to remain unpunished. Future research would do well to unpack the mechanism by which plausible deniability affects social judgments and decisions even further. For example, does plausible deniability affect memory for what the candidate said or did, perhaps making it harder to remember the behavior that was more ambiguous to interpret? Does it affect liking or the disposition people ascribe to a candidate (e.g., do they ever seem "slippery" or cunning)? Many interesting questions remain.

Our results are also notable for something we did not find: different patterns of results for different types of verbal overconfidence. Confident candidates in Experiments 1, 2, and 3 claimed to be better than others, when in fact they were not, or what Moore and Healy (2008) called overplacement. And the confident candidate in Experiment 5 displayed excessive faith in his (decision) accuracy, or what Moore and Healy (2008) call overprecision. We obtain consistent effects for these different varieties of overconfidence. That might be surprising given the dramatic differences in the psychology giving rise to each type of overconfidence (Moore & Schatz, 2017). However, our failure to find a difference is consistent with the failure to distinguish between them in the common vernacular. Scholarly distinctions between them are simply not part of the way most laypeople think about confidence, confidence expression, and overconfidence; therefore, it is understandable that participants do not distinguish between them in their reactions to overconfidence in our studies.

Parsing our operationalizations of overconfidence highlights another issue worth discussing. Given the lack of verifiability of most nonverbal displays of confidence, there are grounds to believe that they cannot provide a measure of overconfidence because it is impossible to compare expressed confidence with the truth. However, we note the power of these expressions of confidence in shaping participants' perceptions of targets. If nonverbal expressions represented nothing more than cheap talk, they should have been regarded as such. Our participants, however, clearly took them seriously. Verbal and nonverbal expressions of confidence, relative to lack of confidence, produce similar benefits at Time 1 in most of the studies we present. Moreover, even confidence that was displayed in the unattached condition was viewed by participants as signaling higher confidence in the task at hand, as compared to cautiousness displayed in that same condition. Therefore, participants inferred that an individual who showed general confidence was also confident in the task he was working on.

The current experiments contribute to the communication/interactionist perspective on the function and adaptiveness of nonverbal behavior. According to this perspective, nonverbal behavior developed and endured in humans in part because it allows a person to communicate about his or her internal state (e.g., feelings or intentions) while maintaining an element of elusiveness (DePaulo, 1992; Fridlund & Russell, 2006). For example, while flirting, people will convey a confluence of mixed and subtle messages via nonverbal behaviors (e.g., a half-smile and lowered eyes). Among other possible benefits, this indirect signal of interest allows flirters to gauge the preferences of the other party without the risk of an explicit proposition which makes them vulnerable to outright rejection (Buss & Schmitt, 1993; Moore, 2010). Precisely because of its indirect signaling, we argue that people who act confident through nonverbal behaviors are able to capitalize on the benefits of those signals without incurring the costs if

performance falls short. We have essentially identified an accountability loophole in the communication of confidence (similar to those in indirect speech; see Pinker et al., 2008) that allows confident actors to maintain plausible (or possible) deniability, if necessary. As Keating (2016) observed, "nuanced, nonverbal messages that leave open multiple possibilities could be an advantage in negotiating the social world—disguise and conquer, at least to a point" (p. 33).

The current work also contributes to the literature on nonverbal communication by exploring the issue of nonverbal deception. Namely, scholars have argued that in many species of animals, there exists an "arms race" between those who try to deceive others and those who wish to avoid being deceived (e.g., von Hippel & Trivers, 2011). For example, female fireflies in the genus *Poturis* can mimic the mating flash of females in the genus *Photinus* (Lloyd, 1986). Once they have successfully attracted a male, they eat him. Over evolutionary time, the female fireflies developed the ability to "deceive" males of another species; therefore, there is now evolutionary pressure for males in the genus *Photinus* to develop the ability to detect such deceit. Once such an ability has evolved, then females in the genus *Poturis* might develop a different, more effective way to deceive the males, to which the males must "learn" to detect over evolutionary time, and so on, and so on. The current findings suggest that the nonverbal display of confidence (and perhaps nonverbal communication more generally) might provide "deceivers"[7] with useful tools for deception. Overconfidence expressed nonverbally allows the individual to avoid being identified as a liar because no explicit claim of confidence was made. Therefore, even when overconfidence is detected by others, there is no corresponding punishment.

[7] Note that we make no claims about whether overconfident individuals are "deceiving" others in the way that is commonly defined in the literature – a conscious, deliberate attempt to mislead others. Rather, we use the term "deceiver" here simply to refer to someone who sends a signal that is inconsistent with the truth, whether such a signal is sent consciously and deliberately or not.

Of course, our focus in the current paper is on contexts in which individuals' confidence was unjustified – that is, contexts in which individuals were *over*confident, rather than justifiably confident. What about contexts in which individuals' confidence was justified? Prior research has already demonstrated the social benefits of justifiable confidence, in that it leads to attributions of competence and to the affordance of higher status (Anderson et al., 2012; Zarnoth & Sniezek, 1997). Therefore, the mixed consequences we demonstrate here should be taken as part of a broader set of findings that include contexts in which individuals were overconfident as well as justifiably confident.

Given that confident nonverbal behavior is such an effective and low risk conduit to positive signaling about oneself, why is it not *even more* prevalent and prominent in social interactions? For example, people do try to present themselves accurately to others on social media platforms, when they could construct a more positive profile (Back et al., 2010; Kraus & Chen, 2014). There are several possibilities, both psychological and practical in nature, which have been evoked to answer this question. One is that people have a desire to have others' impressions of them match their preexisting impressions of themselves (Swann, 1990), in part to validate these views (e.g., verify a shared reality), but also so that others have realistic expectations of what people can accomplish and handle (Swann, Stein-Seroussi, & Giesler, 1992). Following this logic, people may find it uncomfortable or undesirable to act in a manner inconsistent with how they feel, *especially* if displaying too much or too little confidence in their abilities. Pragmatically speaking, if people present themselves too positively, others may expect too much from them. In addition, some people might simply be bad at feigning nonverbal confidence if they are not truly feeling it; they risk expending energy on self-presentation

(Critcher & Ferguson, 2014; Pennebaker & Chew, 1985) and still appearing dishonest or inauthentic (DePaulo, 1992; Kraus & Chen, 2014).

As scholars continue to study confidence expressions and their consequences, culture is an important moderator to examine in future research. Both verbal and nonverbal behavior are intricate manifestations of cultural norms and practices (Brown & Levinson, 1987). For example, in some cultures, eye contact can signal confidence, whereas in other cultures, it may be confrontational (Matsumoto & Hwang, 2016). Additionally, expressions of confidence are more likely to be normative and expected in individualistic, or individual-focused cultures than in collectivistic, or group-focused ones (Heine & Lehman, 1999). If confidence is inappropriate or off-putting in certain cultural contexts, or by people of certain demographics, then expressing confidence in a way that maintains plausible deniability about the precise magnitude or meaning of the expression could be especially useful for protecting vulnerable reputations.

The theory of tight versus loose cultures (Gelfand et al., 2011) is also potentially useful for considering whether nonverbal expressions of overconfidence would be a liability across a variety of situations and cultures. Tight cultures are those in which behaviors among individuals tend to be similar and homogeneous, and where deviations from the norm are easily detected (and sanctioned). Loose cultures are the opposite, where behaviors are not as predictable, and are more open to interpretation. This openness could translate into a higher degree of plausible deniability for expressions of overconfidence; thus, one might expect overconfidence to be a greater liability in tight cultures compared to loose.

It is also possible that it is easier to identify nuance in nonverbal expressions of confidence from familiar others, friends, and colleagues with whom one has a history (Elfenbein & Ambady, 2002). This history would make salient the within-person differences across

different situations, revealing overconfidence. On the other hand, strangers, job applicants, consultants, or presidential candidates with whom we lack a history are more likely to benefit from the bold nonverbal display of overconfidence.

In conclusion, the *plausible deniability hypothesis* helps partly explain why overconfidence is sometimes a liability. In the current studies, plausible deniability was created through nonverbal expressions of confidence, unattached to specific, falsifiable claims; however, there are other ways to create plausible deniability. For example, after being shown to be confident but in error, undermining the expertise or credibility of those reporting the error can create plausible deniability (such as by calling the test results “inaccurate” or propagators of facts “fake news”). Through leveraging plausible deniability, one could theoretically enjoy the reputational benefits of overconfidence without its costs.

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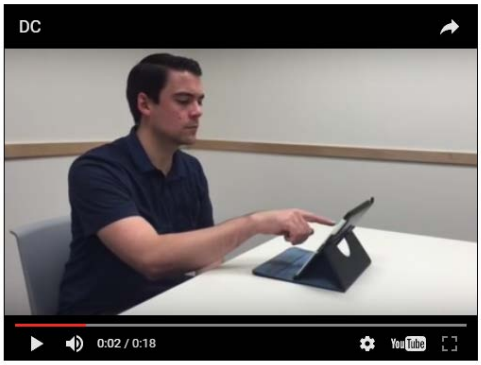
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Appendix A

Still photographs from the survey of the candidates looking confident and cautious in the video, respectively, in Experiment 4.





Appendix B

Still photographs from the videos of the advisors looking cautious and confident, respectively, in Experiment 5.





Figure Captions

Figure 1. Left panels: Mean ratings with standard errors of desirability as a collaborator of the confident and cautious candidates in the verbal and nonverbal conditions at Time 1 (before performance information) and Time 2 (after performance information) in Experiment 1A. Right panels: The percentage of participants that selected each collaborator in Experiment 1A.

Figure 2. Left panels: Mean ratings with standard errors of competence at the job of the confident and cautious advisors in the mixed channel-attached (top panels), nonverbal-only-attached (middle panels), and nonverbal-only-unattached (bottom panels) conditions at Time 1 (before decision performance information) and Time 2 (after decision performance information). Attached or not refers to whether the advisors' confidence was about the advisors' decisions (attached) or reflected the advisors' general-demeanor (unattached) in Experiment 5. Right panels: The percentage of participants that selected each candidate in Experiment 5.

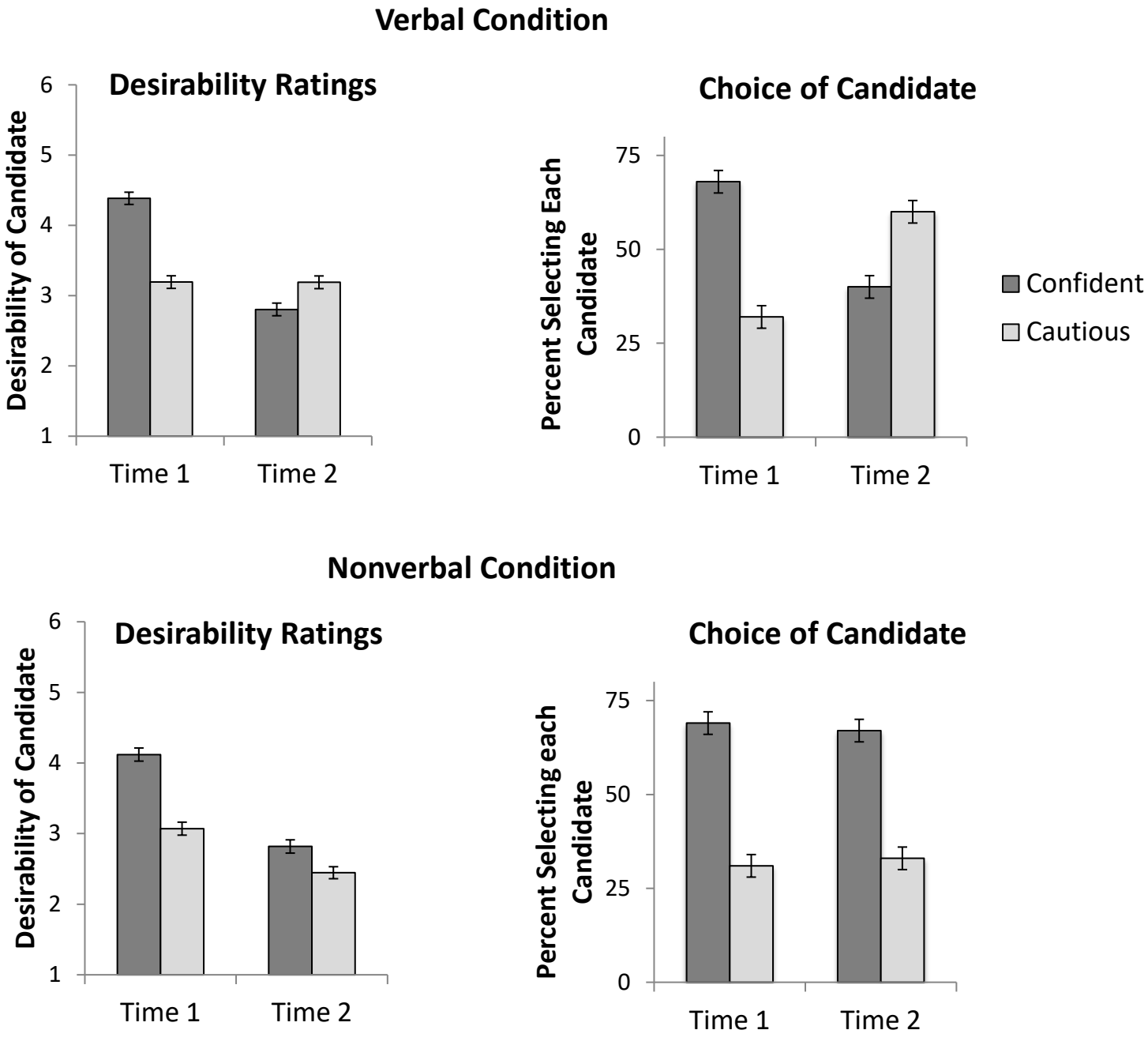

Verbal Condition
Desirability Ratings
Desirability of Candidate
6
5
4
3
2
1
Time 1
Time 2
Choice of Candidate
Percent Selecting Each Candidate
75
50
25
0
Time 1
Time 2
Confident
Cautious
Nonverbal Condition
Desirability Ratings
Desirability of Candidate
6
5
4
3
2
1
Time 1
Time 2
Choice of Candidate
Percent Selecting each Candidate
75
50
25
0
Time 1
Time 2

Figure 1.

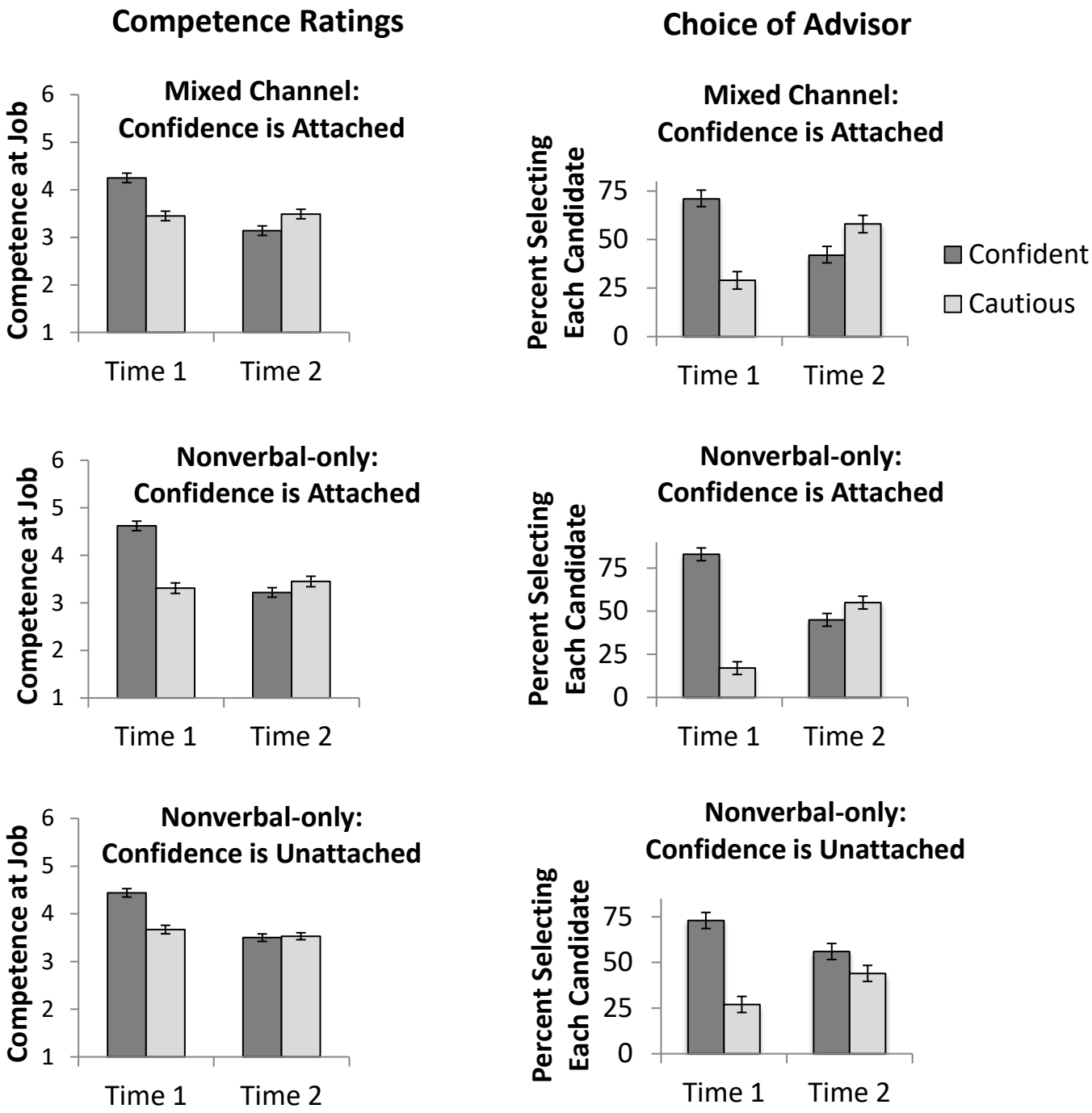

Competence Ratings
Choice of Advisor
Mixed Channel: Confidence is Attached
Competence at Job
Percent Selecting Each Candidate
Confident
Cautious
Nonverbal-only: Confidence is Attached
Nonverbal-only: Confidence is Unattached
Time 1
Time 2

Figure 2.