Insinuation Anxiety:
Fear of Signaling Distrust after Conflict of Interest Disclosures

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Abstract

When experts have conflicts of interest, disclosure—informing an advisee of an advisor’s conflict—is often advocated. Yet, in four experiments (three conducted in medical contexts, one in a general risk-taking context), we show that disclosure of a (financial or non-financial) conflict of interest can have an adverse effect on the advisor-advisee relationship. Disclosure places advisees in an effective bind in that it decreases an advisee’s trust in the advice while simultaneously increasing the pressure to comply with the advice due to a fear of signaling distrust. We show that this “insinuation anxiety” effect persists whether the disclosure is voluntary or required by law, and whether the disclosed conflict is big or small. However, the anxiety diminishes when the disclosure is made by an external source rather than directly by the advisor.

Keywords: social influence, advice, decision-making, ethics, conflicts of interest, disclosure, medical policy
A conflict of interest (COI) exists when primary ethical or professional interests clash with personal interests, a common situation in medicine (Institute of Medicine, 2009). Physicians face diverse COIs, for example, when offered gifts from pharmaceutical companies, referral fees for enrolling patients in clinical trials, or when they benefit financially from tests or procedures they recommend to patients.

Disclosure is the most ubiquitous policy response to COIs. Neither the American Medical Association’s 2005 Code of Ethics nor the 2010 Health Care Reform Act discourages physicians from exposing themselves to conflicts, but both require that the physicians, or industry, disclose them. In theory, disclosure of COIs provides potentially useful information (of which advisees might otherwise not be aware) about the incentives an advisor faces, and enables advisees to make more informed decisions about whether to follow the advice they receive.

However, by making advisees aware of the interests of advisors, disclosure can, paradoxically, increase advisee’s pressure to comply with the advice in order to satisfy the advisor’s self-interest—a phenomenon we have documented and termed the “panhandler effect” (Sah, Loewenstein, & Cain, 2013). The panhandler effect occurs with COI disclosures because advisees, now aware of their advisor’s self-interest, view the disclosure as an implicit favor request. In this paper, we examine a different mechanism: “insinuation anxiety,” which refers to advisees’ anxiety about how their rejection of advice may be interpreted by the advisor as an insinuation that the advisor is corrupt. We demonstrate that although insinuation anxiety may have an overlapping effect to the panhandler effect, it is a separate phenomenon and can occur in the absence of the panhandler effect.
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To better understand insinuation anxiety, imagine that a patient rejects a doctor’s advice to enter a clinical trial rather than stick with the drug that they have been taking. In the absence of a disclosed COI by the physician, there are many plausible medical or personal explanations for the patient’s decision to stay on the current drug—e.g., an aversion to risk or satisfaction with the current drug. However, if the doctor has disclosed that he/she will benefit if the patient enters the new drug trial, a new and salient explanation is introduced for the patient’s unwillingness to enroll: the patient does not trust the doctor to give good advice. The patient may believe this is especially offensive to the doctor since being affected by a COI is traditionally (but often incorrectly) thought to stem from intentional corruption rather than unintentional bias (Dana & Loewenstein, 2003; Sah & Fugh-Berman, 2013; Sah, 2012). Refusing the recommendation, therefore, becomes tantamount to calling the doctor a crook. It is almost inevitable that the advisor will make some inference about the advisee’s motives for rejecting the advice (Jones, 1990), and, due to a number of concerns including saving the “face” of their advisor (Goffman, 1956; Lim & Bowers, 1991), evading embarrassment (Modigliani, 1968, 1971), or showing politeness (Brown & Levinson, 1987), the advisee will want to avoid signaling a negative attitude toward the advisor (Apfelbaum, Sommers, & Norton, 2008). People put considerable effort into maintaining harmonious relationships (Baumeister & Leary, 1995); rejecting the recommendation risks undermining harmony by signaling distrust, and raises concerns regarding the future quality of care.

Given these points, how will disclosure affect patient compliance with advice? On the one hand, by alerting the patient to potential bias, disclosure should reduce trust and, hence, reduce compliance. On the other hand, by introducing insinuation anxiety, disclosure can
increase pressure to comply. Although the net effect of these two influences is indeterminate, and will vary by context (as it does in our experiments), both effects risk poisoning the doctor-patient relationship.

Insinuation Anxiety versus the Panhandler Effect

Insinuation anxiety and the panhandler effect are both mechanisms that are likely to arise in situations in which conflicts of interest are disclosed. Although the effects are not mutually exclusive and are even likely to co-occur, each effect can emerge separately and be especially prominent in specific situations.

Insinuation anxiety is primarily about discomfort with signaling distrust, while the panhandler effect is primarily about discomfort with signaling unhelpfulness. So, the predominance of each depends on what is signaled by non-compliance with (what has been disclosed as) potentially self-serving advice: distrust or unhelpfulness. Since insinuation anxiety relies on the presumption that offering self-serving advice is somehow inappropriate, it is especially likely to occur when the advisor is, or should be, putting the interests of the advisee first, for example as patients would like to believe of their doctors. The insinuation anxiety we are predicting comes from the impropriety of insinuating that one’s advisor is offering self-serving advice; “Well, I never!”

When it is clear and/or more appropriate to offer self-serving advice, for example, car salespersons or estate agents, panhandler effects are more likely than insinuation anxiety effects. Car shoppers are unlikely to trust car salespersons. Salespersons likely know that most buyers do not trust them, and car shoppers know that salespersons know they are not trusted. Hence, a car seller’s disclosure to a potential customer that they needed to sell a car to meet their quota
and retain their job would be unlikely to elicit insinuation anxiety from the shopper, but it could produce a panhandler effect, if framed effectively by the salesperson; “Please.”

Both insinuation anxiety and the panhandler effect are also more likely to occur in ongoing, warm relationships, such as those likely to exist between an advisee and long-time advisor. Turning down the offer of a car dealer who is a friend could, in fact, produce insinuation anxiety. That is, rejection of the car could be interpreted as a signal that you don’t believe the seller has prioritized the altruism of friendship over the desire to sell the car at a profit. By the same token, a doctor one has a long-standing relationship with might be especially insulted by an insinuation that she gave self-serving advice. Indeed, prior research has demonstrated that social pressures can work this way, such as when dental patients take more expensive treatment the longer they have known their dentists (Schwartz, Luce, & Ariely, 2011). Furthermore, both insinuation anxiety and the panhandler effect are more likely to occur, and to have greater effects, in face-to-face encounters, in which both rejecting advice that would benefit the advisor and insinuating that the advisor is corrupt would be more uncomfortable than would be the case if the advisor was more remote.

Whether the advisee’s information is full or partial can also determine how self-serving the advice appears to be. In medical contexts, including that typified by the first three scenarios in this paper, it is difficult to tell if the advice is good or bad for the patient; patients have incomplete information. Thus, non-compliance might be attributed to mistrust of the doctor’s beneficence. This stands in contrast to the experimental setup we employed when examining the panhandler effect (Sah et al., 2013), in which it was usually quite clear that the advice was inferior for the advisee and self-serving for the advisor (in most experiments, advisees had full information). The assumption of advisor-beneficence may have been lacking in this situation.
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and it may seem more salient that the advice is a request to help the advisor (creating panhandler effects), since it clearly is not intended to help the advisee.

In the studies presented here, we first test people’s intuitions in three medical scenarios in which patients would be unclear as to whether the advice is good or bad and we identify a clear insinuation anxiety effect that mediates the relationship between disclosure of a conflict of interest and taking the doctor’s advice. We then move to the field in a different, more general, advice-taking context in which advisor-advisee interactions are face-to-face. We find that insinuation anxiety pressures which accompany disclosure of a conflict of interest are greater in this face-to-face context in the sense that they significantly increase compliance with advice that is trusted less. In studies 2–4, we explicitly test for the panhandler effect as well as insinuation anxiety in order to distinguish between the two effects. We show that either the panhandler effect is absent from the situation (studies 2 and 4) or even reversed (study 3) in that people who feel insinuation anxiety are less likely to feel pressure to help the advisor.

When it comes to actual compliance, we observe, via mediation analyses, that disclosure produces conflicting effects: a decrease in compliance with advice due to a decrease in distrust, but an increase in compliance due to insinuation anxiety. In the first three, hypothetical choice, studies, the net effect of these two forces on compliance, compared to nondisclosure, is either zero or to decrease compliance, which may reflect the fact that people underestimate the discomfort of turning down advice in this hypothetical setting. In the fourth study, which involves real advice from a real advisor who stands to benefit from compliance, the net effect of these forces is to significantly increase compliance with less trusted advice.
The Experiments

In the first three scenario experiments, participants adopted the perspective of a patient receiving a recommendation from a doctor who presented two options and recommended one of them. The main experimental manipulation varied whether the physician disclosed to the patient that the recommended option yielded an extra benefit to the physician. Our main predictions were that the disclosure would (1) reduce trust, but (2) increase pressure to follow the recommendation due to insinuation anxiety. The fourth field experiment had real monetary stakes and examined advice-taking when advisor-advisee interactions were face-to-face.

Experiment 1: Disclosing Financial Conflicts-of-Interest

Method

Participants. Participants \((N = 112; 38.7\% \text{ female}, \text{ median age category } = 26–35 \text{ years}^1)\) were recruited, for $0.10 each on Amazon.com’s Mechanical Turk (MTurk) website [MTurk is an online labor system that allows researchers to conduct online experiments with a sample more diverse than undergraduate students; see Goodman, Cryder, & Cheema, 2012)].

Procedure. Participants were instructed to adopt the perspective of a patient, and read a brief description of their symptoms. Then, they listened to a voice recording of a “doctor” (actually an advanced medical student playing the role of a physician) who described two treatment options: to enter a clinical trial, which the doctor recommended, or to continue to use a standard drug. The participant was then asked to decide whether he/she would follow the doctor’s recommendation or stick with their current medication. In the nondisclosure condition, the patient received no further information. In the disclosure condition, the recording was

\(^1\) Age was measured in categories rather than absolute values
initially identical but after delivering his recommendation, the doctor revealed a financial COI:

“The do think it is important, however, to let you know I will receive a referral fee from the manufacturer of the drug if I refer you for the clinical trial.” After listening to the doctor, participants indicated their agreement with three statements, on a 5-point Likert scale, designed to measure trust: “My doctor has my best interests at heart,” “I trust my doctor’s recommendation,” and “I will continue to see the doctor in the future,” and one question regarding insinuation anxiety, “I worry that the doctor will believe I think he is biased if I turn down his recommendation.”

Results and Discussion

Responses to the three trust statements were highly correlated (p < .001) and loaded onto a single factor (Cronbach’s α = .83) and so were averaged to give a composite measure of trust.\(^2\) Participants who received disclosure reported significantly less trust, (M = 3.68, SD = .87 vs. M = 4.01, SD = .61), F(1, 110) = 5.73, p = .02, \(\eta^p^2 = .05\), yet greater insinuation anxiety, (M = 3.13, SD = 1.13 vs. M = 2.41, SD = .94), F(1, 110) = 12.90, p < .001, \(\eta^p^2 = .10\), compared to those that did not receive disclosure. No difference was reported between conditions regarding compliance with the doctor’s advice, (M = 3.30, SD = 1.16 vs. M = 3.48, SD = 1.17), F(1, 110) = .71, p = .40, \(\eta^p^2 = .006\), suggesting that the increased pressure to comply associated with insinuation anxiety and the decreased desire to comply as a result of decreased trust approximately offset one-another.

\(^2\) Although the three trust items were highly correlated, one of the questions regarding continuing to see the doctor in the future could be considered a behavior intention and may tap into a different psychological construct than our other two indicators of trust. Therefore, we also conducted analyses using responses from each trust question separately (in this and the following experiments) and found similar results. For the sake of parsimony, we report the combined measure of trust in all experiments.
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Since insinuation anxiety is likely to be reduced in this hypothetical setting, of greater importance for understanding the mechanism and its potential effect on behavior is whether the opposing forces (trust and insinuation anxiety) mediated the relationship between disclosure and taking the doctor’s advice. Bootstrapping mediation analyses (Preacher & Hayes, 2008) for estimating direct and indirect effects with multiple mediators revealed that the opposing forces fully mediated the relationship between disclosure and compliance (Figure 1). Furthermore, the analysis revealed that the indirect effect of disclosure was significant for both trust (-.36), 95% confidence-interval (CI) (-.66, -.07), and insinuation anxiety (.15), 95% CI (.03, .34).

Our causal model, therefore, demonstrated that both trust and insinuation anxiety significantly affected, in opposite directions, the decision to take the doctor’s advice. Whether or not this anxiety ultimately alters behavior (which will depend on the relative strength of the two forces), it imposes a burden on patients that ideally should not be present when making decisions about medical care.

**Experiment 2: Disclosure of No Conflict-of-Interest**

To interpret whether nondisclosure in the previous experiment led patients to believe the doctor had no COI, the second experiment included a “disclosure of no-conflict” condition in which the doctor explicitly stated that he had no personal agenda in recommending the treatment. If nondisclosure leads patients to believe the doctor has no COIs, the results for disclosing no-conflict should be equivalent to those for nondisclosure. If, however, disclosing no-conflict increases trust and decreases insinuation anxiety, this result suggests that some patients may already be concerned about bias in the advice they receive. Past studies have shown that
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advisors who declare the absence of conflicts are trusted more and this signal improves the advisor-advisee relationship (Sah & Loewenstein, 2014).

Furthermore, doctors often insist that small gifts do not tarnish the objectivity of their advice (Cain & Detsky, 2008; Sah & Larrick, 2013; Sah, 2012). This experiment also investigated whether larger COIs create greater distrust and also greater insinuation anxiety, or whether patients view COIs in a binary way, registering only their presence or absence. Finally, since non-financial as well as financial COIs constitute important influences on a doctor’s behavior, we explored the effect of the disclosure of a non-financial COI. Again, we predicted that disclosure would create opposing forces on the advisee, decreasing trust yet increasing pressure to comply due to insinuation anxiety.

Method

Participants. Participants were 485 alumni at one of the author’s universities (45.9% female; median age category = 36–45 years). We offered each participant a university t-shirt if we achieved a response rate of over 80%. We emailed 736 alumni and achieved a 65.9% response rate (but nevertheless gave all respondents t-shirts).

Procedure. As in Experiment 1, participants listened to a voice recording from the doctor offering two treatment options; to take a standard drug that the patient had taken previously or, as the doctor recommended in all conditions, to enroll in a clinical trial. There were four conditions: (1) nondisclosure, in which no further information was given; (2) disclosure of no-conflict, where the doctor stated, “But let me also say that I have no personal interest, I have nothing to gain from you entering the trial”; (3) disclosure of a small COI, communicated by: “I do think it is important to let you know that I am part of the research team
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coloring the clinical trial and we need more people to participate in order for me to publish our results in a top medical journal. So it would be helpful for my career if you could participate in the trial. But let me also say that there are plenty of other patients that are eligible”; and (4) disclosure of a larger COI, in which the doctor said the same first sentence as in the third condition but then gave a different stronger ending: “So it would be tremendously helpful for me and my career if you could participate in the trial. We are only a few participants away from completing the study."

As in Experiment 1, after listening to the doctor, we measured the patients’ trust with the same three questions (Cronbach’s $\alpha = .79$) and insinuation anxiety. We also included an additional question to measure the panhandler effect worded similarly to previous studies measuring this effect (Sah et al., 2013), “I wanted to help the doctor by following his advice.”

Results and Discussion

There were significant differences between the four conditions for trust, insinuation anxiety and taking the doctor’s advice but there was no significant difference for the panhandler effect (please see Table 1 for means and statistics).

Participants appeared to appreciate doctors who disclosed that they had no personal agendas (see Table 1 and Figure 2). Compared to nondisclosure, participants were significantly more likely to trust the advice ($p = .01$) and less likely to report feeling insinuation anxiety ($p = .03$). Thus, doctors’ reassurances that they had no personal agenda reassured patients. This suggests that biased advice may already be a concern for some participants, and these participants may not fully trust their doctor’s advice. Similar to other studies in a nonmedical
context, this study shows that disclosure of a lack of self-interest can increase trust (Sah & Loewenstein, 2014).

The magnitude of the COI had no effect in this scenario; disclosure of both smaller and larger COIs led to similar levels of decrease in trust and increase in insinuation anxiety. With disclosure of a conflict (either large or small), participants trusted the advice less (both \( p < .006 \)) and reported greater insinuation anxiety (both \( p < .008 \)) compared to nondisclosure. Therefore, these results again demonstrate (this time with a non-financial COI) that disclosure results in conflicting forces.

In this experiment, participants’ introspections led them to believe that, with COI disclosure, they would be less likely to follow the physician’s advice, i.e., the first force (decreased trust) was greater than the second force (insinuation anxiety). Mediation analyses (in Table 2) showed that both forces significantly affected the decision to take the doctor’s advice. The effect of disclosing a conflict on compliance was significantly reduced when the mediators (trust and insinuation anxiety) were included in the model; the indirect effect was significant for each type of disclosure and mediator (resulting in 95% CIs that excluded zero). This presents further evidence that COI disclosure leads to significantly decreased trust and increased insinuation anxiety and both of these factors are significant mediators and explain the relationship between COI disclosure and taking the doctor’s advice.

**Experiment 3: Mandatory and External Disclosure**

This experiment included two extra conditions in addition to nondisclosure and (personal) COI-disclosure: external disclosure and legally required disclosure.

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3 Further research could examine whether different magnitudes of financial COIs would make a difference to patients.
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*External disclosure.* External disclosure—disclosure from a third party—gives advisees the same information about the COI as personal disclosure but from a different source. If disclosure consists of two components—an informational component which decreases trust (due to suspicion that the advice may be biased) and a social component which could increase the pressure to comply (Sah et al., 2013), then the informational component (causing a decrease in trust) should be similar whether the information comes directly from the advisor, is external, voluntary or even legally required.

However, the social component may change depending on the source of the disclosure, i.e., it may be greater with personal, rather than external, disclosure. With personal disclosure, direct from an advisor, lack of trust should be a more salient explanation for advice-rejection than in external disclosure, when both parties are aware that the advisee knows about the conflict but there has been no explicit communication about it. Advice-rejection with external disclosure would convey less about the advisor’s integrity since external disclosure is less salient to the advisor and absent from the advisor-advisee interaction. Therefore, with external disclosure, we predicted that trust would decrease similarly to that seen with personal disclosure but insinuation anxiety would be less than with personal disclosure.

*Legally required disclosure.* To rule out the objection that anxiety is produced with disclosure only because the doctor appears especially forthcoming (via voluntary disclosure), and one is reluctant to let this doctor down by rejecting the advice, we also included a condition in which disclosure was legally required. Since the voluntary/mandatory distinction does not affect the salience of the corruption insinuation for the patient turning down the advice, we predicted that insinuation anxiety would be similar whether the disclosure was required or not.
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One could hypothesize that voluntary personal disclosure would create more trust than legally required disclosure (and even external disclosure). On the other hand, as we have mentioned, trust may not vary due to how the COI disclosure is communicated but instead decrease similarly since the information alerts one to the same uncertainty regarding the quality of advice. We therefore predicted that legally required disclosure would lead to a similar decrease in trust and a similar increase in insinuation anxiety as personal disclosure.

Method

Participants. Participants (N = 785, 41.4% female; median age category = 26–35 years) were recruited, for $0.25, from MTurk.

Procedure. Participants again listened to a voice recording from the ‘doctor’ as in the first two experiments. We varied the scenarios for robustness. One of the new situations (“C” for colonoscopy) involved the doctor’s recommendation to have a colonoscopy “early,” contrary to the colonoscopy society’s guidelines. The other new scenario (“A” for ambulatory center) involved the doctor’s recommendation to obtain minor surgery at a distant ambulatory surgery center, rather than the nearby hospital where the patient had had a similar successful treatment previously.

Patients were randomly assigned to one of four conditions:

(1) “Personal Disclosure,” in which the doctor said (C scenario): “However, I should tell you that I receive a payment for every colonoscopy I perform;” or (A scenario): “I should notify you that I have a partnership interest in the ambulatory surgery center and I will receive a larger payment if you have the procedure done at this surgery center rather than at the hospital.”
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(2) “Required Disclosure,” in which participants received the same personal disclosure from their doctor and were also instructed that, “Your doctor will tell you about a conflict of interest because he is required to do so by law” (displayed in italics and red font when the participant was listening to the doctor).

(3) “External Disclosure,” in which participants read, “Before you walk into the doctor’s office, the receptionist hands you a sheet of paper that reads…” which was followed by (C scenario): “The director of the clinic would like to disclose the following information to you. Each doctor on this premise receives a payment for every colonoscopy that the doctor performs”; or (A scenario): “The Medical Director would like to disclose the following information to you. Some doctors in this clinic have partnership interests in the Ambulatory Surgery Center and will receive larger payments if a patient receives treatment at this center instead of the hospital… Dr. Brooks is listed among the doctors with a partnership interest in the Ambulatory Surgery Center.”

(4) “No Disclosure,” in which the patient received no COI information.

Again, after listening to the doctor, we measured the patients’ trust (Cronbach’s α = .88), insinuation anxiety, the panhandler effect and whether the patient would take the doctor’s advice.

Results and Discussion

There were significant differences across the four conditions for all our measures—trust, insinuation anxiety, taking the doctor’s advice and, in contrast to Experiment 2, the panhandler effect (please see Table 3 for means and statistics). Participants who received disclosure in any form reported less trust than those with nondisclosure (all ps < .001, see Table 3 and Figure 3).
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All three disclosures (personal, required and external) also resulted in significantly greater insinuation anxiety than nondisclosure (all $ps < .03$).

As predicted, when disclosure was externally provided, there was significantly less insinuation anxiety than there was with personal or required disclosure ($p = .03$), although it was still higher than that with nondisclosure ($p = .03$). Also as predicted, required disclosure affected the advisee much like personal disclosure; it led to a similar decrease in trust and a similar increase in insinuation anxiety.

In this study, the pressure to help the doctor decreased with all types of disclosures (personal, required and external) compared to nondisclosure (all $ps < .001$). There was no difference in the panhandler effect among the different types of disclosures. This provides further evidence that disclosure’s increased pressure to comply with the doctor is operating through the different mechanism of insinuation anxiety versus the panhandler effect in this context. In fact, it seems that patients were reacting via insinuation anxiety not only to the inappropriateness to give potentially biased advice in this situation but also to the inappropriateness to help the doctor by following his advice.

As in Experiment 2, participants with disclosure (personal, required or external) indicated that they would be less likely to comply compared with nondisclosure (all $ps < .001$). However, with personal and required disclosure, participants were significantly more likely to comply than with external disclosure ($p = .002$). Therefore, when insinuation anxiety was reduced (in external disclosure versus personal and required disclosure), so was compliance.

Mediation analysis (Table 2) again revealed that the two variables (trust and insinuation anxiety) mediated the association between disclosure and compliance. The effect of disclosure on compliance was significantly reduced when the two mediators were included in the model;
the specific indirect effects of each mediator were significant (each 95% CI excluded zero). Therefore, both trust and insinuation anxiety affected, in opposite directions, the decision to follow the doctor’s advice.

Although we believe that the absolute magnitude of insinuation anxiety may be greater in the real world, the differences between the disclosure conditions are informative. Specifically, information provided by a third party about the doctor’s COI may allow patients to reject the recommendation (arguably the intended purpose of disclosure) without sending a mutually embarrassing signal of distrust to the doctor.

**Experiment 4: Face-to-Face Disclosure with Real Choices and Monetary Consequences**

In two of the three prior experiments, the reduction of trust offset the impact of insinuation anxiety, leading to reduced reported compliance with the physician’s advice. In real advisor-advisee interactions, however, insinuation anxiety is likely to be stronger than in hypothetical scenarios. People who are not currently feeling an emotion, such as anxiety, often underestimate the impact of that emotion on behavior (Van Boven, Loewenstein, Welch, & Dunning, 2012; Wray & Stone, 2005). To examine the strength of insinuation anxiety in a real face-to-face interaction, we conducted a field experiment in which an advisor (purportedly a professional at work—an important distinction from prior studies) gave advice to an advisee, who then made a decision with real material consequences. We predicted that, with disclosure in this situation, insinuation anxiety would increase to an extent that it would increase compliance despite decreased trust.

In this experiment, we focused on the advisor (trained by us) to play the role of a professional that is present to help the advisee and that has demonstrably more knowledge, as
compared to the prior fields studies examining the panhandler effect in which both parties were equal members of the public and have similar information (Sah et al., 2013). Although it would be interesting to examine insinuation anxiety in an actual medical, or other, real-world context in which it is clearly inappropriate for an advisor to not put the advisees’ best interests at heart, due to ethical constraints with conducting such an experiment, we turned to a different context for studying insinuation anxiety, where advisees would not be overly harmed by suboptimal advice. We conducted a field experiment in which we examined real behavior with monetary consequences for both advisor and advisees. We aimed to simulate a situation in which the advisor appeared professional, in good standing, to give the advisee helpful, face-to-face advice. Although we distinguished the experiment from prior experiments designed to produce the panhandler effect (Sah et al., 2013), we acknowledged that insinuation anxiety and the panhandler effect could co-occur.

Method

Participants. Participants were passengers \((N = 253, 58\% \text{ female, } 87\% \text{ Caucasian}, M_{\text{age}} = 44.57, SD = 17.17)\) on a ferry from/to Connecticut and Long Island.

Procedure. A trained confederate (a middle-aged Caucasian male, dressed in business casual) played the role of advisor, and asked advisees to take a short survey for $5. Upon agreement, participants filled out a one-page survey comprising innocuous questions about the ferry. After this, advisees were given an opportunity to indicate how they would like to be paid—either with $5 cash (as initially offered) or a drawing for a mystery cash lottery which offered somewhere between 0 to $10. The expected-value of the lottery was $4.72. In all
conditions, the advisor was rewarded with a $0.50 bonus for every advisee who chose the mystery cash lottery.

Advisees were randomized into four conditions: nondisclosure, COI-disclosure, non-COI disclosure, and no-advice. Aside from the no-advice condition (in which participants were not given any recommendation), the advisor was instructed to recommend the mystery cash lottery using the same scripted recommendation: “I’ve seen a bunch of the payouts of the drawing, and I suggest you go for that option [pointing to the lottery]; it often pays nicely.” In the nondisclosure condition, the advisor gave no further information; in the COI-disclosure condition, the advisor notified the advisee of his conflict by first saying, “I should tell you that I get a small bonus if you pick the drawing. That said...” before giving the scripted recommendation. In the non-COI disclosure, the advisor first disclosed an alternative piece of information to rule out the possibility that any observed increase in compliance was due to the extra time spent conversing with the participant; “I should tell you that there is some risk if you pick the drawing. That said...”

After making their choice, participants were told that the researchers conducting the survey were also interested in the quality of the interaction they had with the interviewer. Participants completed, this time on a 7-point Likert scale, one item that measured their trust of the advisor, “The interviewer placed his own interests above mine” (reverse coded), and two insinuation anxiety measures, “I felt uncomfortable, because I suspected the interviewer’s recommendation may have been biased,” and “I was concerned that the interviewer would believe that I thought he was biased if I turned down his recommendation,” (Cronbach’s $\alpha = .92$). We also measured the panhandler effect, “I felt pressure to help my interviewer” and advisees

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4 Due to the different nature of the study, our measures varied in wording to make it appropriate for the new context.
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responded to a more general discomfort statement which may be unrelated to insinuation anxiety, “It was/would have been uncomfortable to turn down the interviewer’s recommendation.” Participants also rated how much they liked their interviewer and how reputable they found the lottery. They then sealed their responses in an envelope that they knew would go directly to the researchers (i.e., would not be seen by the interviewer/advisor) and finally received either $5 cash or their earnings from the mystery prize lottery, which was determined by the advisor’s randomized pay sheet.

Results and Discussion

There was a significant difference in the advisees’ choice of payment across the four conditions, $\chi^2(3, N = 253) = 22.47, p < .001$. In the no-advice condition ($n = 61$), only 8.2% of participants chose the lottery, revealing the $5 cash as the preferred option in the absence of any recommendation, and there was no significant difference between this condition and the nondisclosure condition ($n = 70$) in which 20.0% of advisees picked the lottery and the non-COI disclosure condition ($n = 60$) in which 16.7% of advisees picked the lottery, $\chi^2(2, N = 191) = 3.68, p = .16$. There were significant differences between the COI-disclosure condition ($n = 62$), in which 41.9% of participants chose the lottery, and the other conditions: the nondisclosure condition, $\chi^2(1, N = 132) = 7.49, p = .006$, the non-COI disclosure condition, $\chi^2(1, N = 122) = 9.36, p = .002$, and the no-advice condition, $\chi^2(1, N = 123) = 18.57, p < .001$.

Advisees felt less trust in the advice given with a COI-disclosure compared to the other two advice conditions (non-COI disclosure and nondisclosure), ($M = 4.75, SD = 1.52$ vs. $M = 5.19, SD = 1.35$), $F(1, 184) = 3.97, p = .048, \eta_p^2 = .02$. At the same time, those advisees in the COI-disclosure condition felt greater insinuation anxiety than in the other advice conditions, ($M$
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= 2.89, \( SD = 1.07 \) vs. \( M = 2.59, SD = 1.04 \), \( F(1, 184) = 3.28, p = .072, \eta^2_p = .02 \). There was no significant difference between the three advice conditions for the other questions regarding the panhandler effect, general discomfort, likability of the interviewer and how reputable participants found the lottery. The mediation results for trust and insinuation anxiety (comparing the COI-disclosure with the other two advice conditions) were directionally as expected but not quite significant as the 95% CI just included zero; trust (-.05), 95% CI (-.34, .07) and insinuation anxiety (.04), 95% CI (-.06, .29). Importantly, however, as anticipated and noted above, with COI-disclosure there was significantly increased compliance with advice (41.9% of advisees took the lottery) compared to each of the other three advice conditions.

Although we did not predict interpersonal differences in this study, we found greater effects for women than men. Specifically, all the main dependent variables of interest (compliance, trust, and insinuation anxiety) were highly significant in the predicted directions for females but reduced or non-significant for males. We present the results (for women only) for each condition in Table 4. Gender effects were not found with the prior three medical scenarios. Investigating the specific reasons for these significant gender effects are outside the scope of this paper.\(^5\) Future research could examine the gender differences and also study how advisor-advisee power and status impacts trust in the advisor and insinuation anxiety.

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\(^5\) Although we can speculate that women had higher expectations than the male advisor would put their interests first and therefore felt higher insinuation anxiety whereas for men the assumption of advisor-beneficence in this situation may have been lacking.
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General Discussion

These four experiments show that disclosure of a COI can have an adverse effect on advice recipients and on the advisor-advisee relationship. It decreases trust in the advice, but can increase pressure to comply due to anxiety about insinuating that the advisor is corrupt.

In Experiment 2, participants felt less insinuation anxiety and greater trust if the doctor disclosed the absence of conflicts. This finding is encouraging because a disclosure policy may lead advisors to avoid COIs so that they can disclose that they have no conflicts (Sah & Loewenstein, 2014), which would be beneficial both in decreasing potential bias and increasing (justifiable) trust. In Experiment 3, explicitly stating that the disclosure was required by law did not substantially affect the burdens experienced by participants, nor did the magnitude of the conflict disclosed in this context (however, more research is needed to investigate if the magnitude of financial COIs produce the same effect). Importantly, we found evidence that the pressure to comply was reduced when the disclosure was made by a salient external source rather than directly by the advisor.

External disclosure is likely to be even more beneficial in real-world contexts in which there may be a greater power asymmetry or a previous relationship that the advisees risks damaging by rejecting the advice. When the disclosure was personal (instead of external) and face-to-face, in Experiment 4, insinuation anxiety was greater and so was compliance with disclosure.

The adverse consequences of disclosure go beyond its effects on trust, the relationship, and (possibly) increased compliance. Disclosure may also cause people to ignore advice that, while conflicted, would have in fact been helpful (Kuang, Weber, & Dana, 2007). People need
advice from experts, and disclosure could have disastrous consequences for people who need medical or financial advice but then ignore it or avoid soliciting it.

Despite the negative effects of disclosure documented here, we generally support policies that increase transparency. Mandatory disclosure can potentially pressure professional societies to reduce the prevalence and severity of COIs and increase the likelihood that advisors themselves will eschew conflicts so as to report their absence (Sah & Loewenstein, 2014). All things considered, therefore, disclosure may still be a net positive in the absence of anything better. But the current research adds to a body of existing research which suggests that disclosure is not the panacea many take it to be; it can not only fail to achieve its intended purposes, but can even have perverse effects (Loewenstein, Sah, & Cain, 2012). This paper provides experimental evidence that disclosing a COI burdens advisees to consider how their advice rejection may be interpreted by the advisor, a consideration that should be absent when making important decisions on matters such as health. It is the advisees who need protecting, not the advisor’s feelings.
References


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Table 1

*Outcomes from Experiment 2*

<table>
<thead>
<tr>
<th></th>
<th>Non-Disclosure (ND)</th>
<th>Disclosure of No Conflict (D_NC)</th>
<th>Disclosure of a Small Conflict (DS)</th>
<th>Disclosure of a Large Conflict (DL)</th>
<th>Effect of Condition</th>
<th>D_NC vs. ND</th>
<th>DS vs. ND</th>
<th>DL vs. ND</th>
<th>DL vs. DS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (standard deviation)</td>
<td>F(3,481) statistic, p-value, $\eta_p^2$</td>
<td>t(481) statistic, p-value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>3.63 (.60)</td>
<td>3.86 (.52)</td>
<td>3.24 (.84)</td>
<td>3.17 (.80)</td>
<td>$F = 26.27$ $p &lt; .001$ $\eta_p^2 = .14$</td>
<td>$t = 2.54$ $p = .01$</td>
<td>$t = -4.26$ $p = .006$</td>
<td>$t = -4.97$ $p &lt; .001$</td>
<td>n.s.</td>
</tr>
<tr>
<td>Insinuation Anxiety</td>
<td>1.98 (.92)</td>
<td>1.71 (.79)</td>
<td>2.32 (1.14)</td>
<td>2.37 (1.08)</td>
<td>$F = 12.24$ $p &lt; .001$ $\eta_p^2 = .07$</td>
<td>$t = -2.16$ $p = .03$</td>
<td>$t = 2.66$ $p = .008$</td>
<td>$t = 3.02$, $p = .003$</td>
<td>n.s.</td>
</tr>
<tr>
<td>Panhandler Effect</td>
<td>2.24 (1.02)</td>
<td>2.28 (.99)</td>
<td>2.29 (1.05)</td>
<td>2.25 (.99)</td>
<td>$F = 0.07$ $p = .98$ $\eta_p^2 &lt; .001$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Take Doctor’s</td>
<td>3.01 (.90)</td>
<td>3.07 (1.04)</td>
<td>2.69 (1.09)</td>
<td>2.51 (1.00)</td>
<td>$F = 8.42$ $p &lt; .001$ $\eta_p^2 = .05$</td>
<td>n.s.</td>
<td>$t = -2.48$ $p = .014$</td>
<td>$t = -3.78$ $p &lt; .001$</td>
<td>n.s.</td>
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<tr>
<td>Recommendation</td>
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<td></td>
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<td></td>
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</tbody>
</table>

*Note.* All responses were on a labeled 5-point Likert scale, strongly disagree/very unlikely (1) to strongly agree/very likely (5).
Table 2

Multiple Mediation Analyses for Experiment 2 and 3

<table>
<thead>
<tr>
<th></th>
<th>Disclosure of No Conflict</th>
<th>Experiment 2 Disclosure of a Small Conflict</th>
<th>Experiment 2 Disclosure of a Large Conflict</th>
<th>Experiment 3 Personal Disclosure</th>
<th>Experiment 3 Required Disclosure</th>
<th>Experiment 3 External Disclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient $a$</td>
<td>.23*</td>
<td>-.39**</td>
<td>-.46***</td>
<td>-.50***</td>
<td>-.44***</td>
<td>-.59***</td>
</tr>
<tr>
<td>Coefficient $b$</td>
<td>.80***</td>
<td>.80***</td>
<td>.80***</td>
<td>.94***</td>
<td>.94***</td>
<td>.94***</td>
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<tr>
<td>Point estimate and</td>
<td>0.18</td>
<td>-.31</td>
<td>-.37</td>
<td>-.47</td>
<td>-.42</td>
<td>-.56</td>
</tr>
<tr>
<td>95% CI for indirect</td>
<td>(.08,.30)</td>
<td>(-.48,-.17)</td>
<td>(-.53,-.21)</td>
<td>(-.62,-.31)</td>
<td>(-.55,-.26)</td>
<td>(-.70,-.41)</td>
</tr>
<tr>
<td>Insinuation Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient $a$</td>
<td>-.27*</td>
<td>.34**</td>
<td>.39**</td>
<td>.45***</td>
<td>.50***</td>
<td>.26***</td>
</tr>
<tr>
<td>Coefficient $b$</td>
<td>.08*</td>
<td>.09*</td>
<td>.09*</td>
<td>.08**</td>
<td>.08**</td>
<td>.08**</td>
</tr>
<tr>
<td>Point estimate and</td>
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<td>.03</td>
<td>.03</td>
<td>.04</td>
<td>.04</td>
<td>.02</td>
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<tr>
<td>95% CI for indirect</td>
<td>(.07,-.01)</td>
<td>(.01,.08)</td>
<td>(.01,.08)</td>
<td>(.01,.07)</td>
<td>(.01,.08)</td>
<td>(.003,.05)</td>
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<tr>
<td>Effect of IV on DV</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(take advice)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient $c'$</td>
<td>-.10</td>
<td>-.04</td>
<td>-.17</td>
<td>-.16</td>
<td>-.10</td>
<td>-.30***</td>
</tr>
<tr>
<td>Coefficient $c$</td>
<td>.06</td>
<td>-.32*</td>
<td>-.50***</td>
<td>-.59***</td>
<td>-.48**</td>
<td>-.84***</td>
</tr>
<tr>
<td>Point estimate and</td>
<td>.16</td>
<td>-.28</td>
<td>-.33</td>
<td>-.43</td>
<td>-.38</td>
<td>-.54</td>
</tr>
<tr>
<td>95% CI for indirect</td>
<td>(.04,.28)</td>
<td>(-.44,-.13)</td>
<td>(-.50,-.17)</td>
<td>(-.58,-.27)</td>
<td>(-.51,-.23)</td>
<td>(-.68,-.38)</td>
</tr>
</tbody>
</table>

Note. Each independent variable (IV) was a dummy variable for the indicated condition. Dummy variables for other conditions were included as covariates in each model. Non-standardized regression coefficients are shown ($a$ refers to effect of IV on the mediator, $b$ refers to the effect of the mediator on the DV [taking doctor’s advice] when controlling for IV), as well as the point estimate and 95% confidence interval (CI) for the bias-corrected indirect effects of IV on DV through proposed mediators ($ab$ paths).

*p < .05. ** p < .01. *** p < .001.
## Table 3

### Outcomes from Experiment 3

<table>
<thead>
<tr>
<th></th>
<th>Non-Disclosure (ND)</th>
<th>Personal Disclosure (PD)</th>
<th>Required Disclosure (RD)</th>
<th>External Disclosure (ED)</th>
<th>Effect of Condition</th>
<th>PD vs. ND</th>
<th>PD vs. RD</th>
<th>PD &amp; RD vs. ED</th>
<th>ED vs. ND</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trust</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F = 20.74</td>
<td>t = -6.05</td>
<td>n.s.</td>
<td>t = 1.74</td>
<td>t = -7.24</td>
</tr>
<tr>
<td></td>
<td>Mean (standard deviation)</td>
<td>F(3,781) statistic, p-value, ( \eta^2_p )</td>
<td></td>
<td></td>
<td>p &lt; .001</td>
<td>p &lt; .001</td>
<td>n.s.</td>
<td>p = .08</td>
<td>p &lt; .001</td>
</tr>
<tr>
<td></td>
<td>3.91 (.75)</td>
<td>3.41 (.91)</td>
<td>3.47 (.80)</td>
<td>3.32 (.80)</td>
<td>t = 3.94</td>
<td>t = 2.20</td>
<td>t = 2.24</td>
<td>p = .03</td>
<td>p = .03</td>
</tr>
<tr>
<td><strong>Insinuation Anxiety</strong></td>
<td>2.28 (1.00)</td>
<td>2.73 (1.23)</td>
<td>2.78 (1.23)</td>
<td>2.54 (1.10)</td>
<td>F = 7.98</td>
<td>t = -3.75</td>
<td>n.s.</td>
<td>n.s.</td>
<td>t = -3.74</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>p &lt; .001</td>
<td>p &lt; .001</td>
<td>n.s.</td>
<td>p &lt; .001</td>
<td></td>
</tr>
<tr>
<td><strong>Panhandler Effect</strong></td>
<td>3.10 (1.10)</td>
<td>2.70 (1.05)</td>
<td>2.87 (.99)</td>
<td>2.70 (1.09)</td>
<td>F = 6.32</td>
<td>t = -3.75</td>
<td>n.s.</td>
<td>n.s.</td>
<td>t = -3.74</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>p &lt; .001</td>
<td>p &lt; .001</td>
<td>n.s.</td>
<td>p &lt; .001</td>
<td></td>
</tr>
<tr>
<td><strong>Take Doctor’s Recommendation</strong></td>
<td>3.73 (1.09)</td>
<td>3.14 (1.19)</td>
<td>3.25 (1.08)</td>
<td>2.89 (1.06)</td>
<td>F = 20.24</td>
<td>t = -5.32</td>
<td>n.s.</td>
<td>t = 3.19</td>
<td>t = -7.56</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>p &lt; .001</td>
<td>p &lt; .001</td>
<td>p = .002</td>
<td>p &lt; .001</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* All responses were on a labeled 5-point Likert scale, strongly disagree/very unlikely (1) to strongly agree/very likely (5).
Table 4

Outcomes from Experiment 4 for women only

<table>
<thead>
<tr>
<th>FEMALES</th>
<th>No Advice (NA) n = 36</th>
<th>Non-disclosure (ND) n = 41</th>
<th>Non-COI disclosure (nonCOI-D) n = 32</th>
<th>COI Disclosure (COI-D) n = 38</th>
<th>Effect of Condition</th>
<th>NonCOI-D vs. ND vs. NA</th>
<th>COI-D vs. NA</th>
<th>COI-D vs. ND</th>
<th>COI-D vs. nonCOI-D</th>
<th>COI-D vs. NonCOI-D &amp; ND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (standard deviation)</td>
<td></td>
<td></td>
<td></td>
<td>$F(2, 105)$ statistic, p-value, $\eta^2$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$t$ statistic, p-value</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>-</td>
<td>5.74 (1.29)</td>
<td>4.74 (1.41)</td>
<td>4.55 (1.50)</td>
<td>$F = 7.89$ $p = .001$ $\eta^2 = .13$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>$t = -3.72$ $p &lt; .001$ n.s $t = -2.43$ $p = .02$</td>
</tr>
<tr>
<td>Insinuation Anxiety</td>
<td>-</td>
<td>2.23 (1.17)</td>
<td>2.66 (.93)</td>
<td>2.97 (1.14)</td>
<td>$F = 4.44$ $p = .01$ $\eta^2 = .08$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>$t = 2.97$ $p = .004$ $t = 1.18$ $t = 2.38$ $p = .24$ $p = .02$</td>
</tr>
<tr>
<td>Panhandler Effect</td>
<td>-</td>
<td>2.46 (1.39)</td>
<td>2.48 (.89)</td>
<td>2.97 (1.24)</td>
<td>$F = 2.12$ $p = .13$ $\eta^2 = .04$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>$t = 1.85$ $p = .07$ $t = 1.67$ $t = 2.04$ $p = .10$ $p = .04$</td>
</tr>
<tr>
<td>Take Advisor’s Recommendation (Lottery) n / %</td>
<td>2 (5.6%)</td>
<td>6 (14.6%)</td>
<td>7 (21.9%)</td>
<td>18 (47.4%)</td>
<td>$\chi^2(3, N = 147) = 20.90$ $p &lt; .001$</td>
<td>$\chi^2 = 3.84$ $p = .15$ $\chi^2 = 16.39$ $p &lt; .001$ $\chi^2 = 9.99$ $p = .002$ $\chi^2 = 4.92$ $p = .03$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. All responses (except taking advice) were on a labeled 7-point Likert scale, strongly disagree (1) to strongly agree (5). The results for men were reduced and / or non-significant.
Disclosure creates decreased trust and increased insinuation anxiety. Although decreased trust will lead to patients being less likely to take the doctor’s recommendation, increased insinuation anxiety created by disclosure increases the pressure to comply with the doctor’s recommendation.

* Note. Non-standardized regression coefficients are shown: $a$ refers to effect of the independent variable (IV: disclosure) on each mediator (trust and insinuation anxiety), $b$ refers to the effect of the mediator on the dependent variable (DV: taking the doctor’s recommendation) when controlling for IV, $c$ refers to the effect of the IV on the DV, and $c'$ refers to the effect of the IV on the DV when controlling for the mediators.
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Figure 2. Experiment 2: Disclosure of a Non-Financial Conflict of Interest

Disclosure of no conflict increases trust and decreases insinuation anxiety. Disclosure (of a small or large COI) resulted in similar levels of decreased trust and increased insinuation anxiety.
**Figure 3. Experiment 3: External Disclosure and Required Disclosure**

Personal and required (mandatory) disclosure creates decreased trust and increased insinuation anxiety. External disclosure elicits decreased trust with only a smaller corresponding increase in insinuation anxiety.