Slow Lies: Response Delays Promote Perceptions of Insincerity

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Abstract

Evaluating other people's sincerity is a ubiquitous and important part of social interactions. Fourteen experiments (total N = 7565; ten preregistered; eleven in the main paper, three in the SOM; with U.S. American and British members of the public, and French students) show that response speed is an important cue on which people base their sincerity inferences. Specifically, people systematically judged slower (vs. faster) responses as less sincere for a range of scenarios from trivial daily conversations to high stakes situations such as police interrogations. Our findings suggest that this is because slower responses are perceived to be the result of the responder suppressing automatic, truthful thoughts, and fabricating a novel answer. People also seem to have a rich lay theory of response speed, which takes into account a variety of situational factors. For instance, the effect of response delay on perceived sincerity is smaller if the response is socially undesirable, or if it can be attributed to mental effort. Finally, we showed that explicit instructions to ignore response speed can reduce the effect of response speed on judgments on sincerity. Our findings not only help ascertain the role of response speed in interpersonal inference making processes, but also carry important practical implication. In particular, the present study highlights the potential effects that may be observed in judicial settings, since the response speed of innocent suspects may mislead people to judge them as insincere and hence guilty.

Keywords: response speed, perceived sincerity, thought suppression, answer fabrication, impression formation

Slow Lies: Response Delays Promote Perceptions of Insincerity

Imagine asking a friend for their thoughts on a dish you cooked and being met with immediate praise of your culinary skills. Now imagine the same scenario with one difference - the response was delivered after a slight delay. While in everyday life, communicators' sincerity and truthfulness can be inferred from what they say (Rosenblum et al., 2019) and how they say it (Hornsey et al., 2019) the aforementioned scenario seems to suggest that it somehow also depends on *when* they say it. In the present study, we asked the question whether and why slower, slower responses can be perceived as less sincere[1].

Much like the loudness and pitch of people's response (Fish et al., 2017) and the genuineness of their smile (Bernstein et al., 2010), if response speed is indeed one of the many ubiquitous social cues that people base their inferences on, then it would be imperative to establish the nature of this phenomenon and its underlying mechanism. The reason for this is that this effect, if present, may manifest without people's awareness, and across many high stakes situations, such as those involving business deals and legal processes. While it may be accurate that slower responses are less sincere, on average, when the situation leaves room for doubt or when the situation is highly important, "accurate on average" is not enough. If outcomes of these high stakes scenarios are contingent on individuals' automatic perceptions of the responder's response speed, then it makes sense for people to be at least aware of such tendencies in order to minimise such tendencies in decision making.

[1] In this article, we use "response speed" to indicate the length of delay between a question and an answer, as it has been done in some recent research (Efendic et al., 2020; Van de Calseyde et al., 2014), rather than speech rate (how many words per minute are spoken by the actor).We strove to keep to this terminology throughout this article. Further, we use the terms "slower responses" to indicated delayed responses, and "faster responses" to indicate immediate responses.

Why would slower responses be perceived as less sincere? To answer this question, it is important to first highlight whether responses could be less sincere in actuality, according to existing research.

Response Speed and Actual Sincerity

Combined with physiological measures such as galvanic skin response, response speed (often indicated as "reaction time") has long been a part of "lie detector" tests used in psychological research such as the Concealed Information Test (Lykken, 1959; Verschuere, Crombez, Degrootte, & Rosseel, 2010). People seem to be slower responders when they lie compared to when they are honest, both in controlled laboratory studies (Seymour & Jess R. Kerlin, 2008; Seymour, Seifert, Shafto, & Mosmann, 2000; Suchotzki, Verschuere, Van Bockstaele, Ben-Shakhar, & Crombez, 2017) and in the field (Mann, Vrij, & Bull, 2002; Vrij, 2000).

Researchers have attributed response speed during deception to the higher levels of cognitive load that typically accompany attempts to deceive (vs. truth telling), such as working memory load and thought inhibition (Miyake et al., 2000). Meta-analytic neuropsychological evidence (Christ, Van Essen, Watson, Brubaker, & McDermott, 2009) suggests that lying taxes working memory, because people have to hold more information in their mind when lying (both the truth and the fabricated version) compared to when telling the truth, activating prefrontal brain regions and causing slower responses. This mechanism may be further exacerbated by thought inhibition processes since people need to take the additional step of inhibiting the spontaneous, raw, and truthful response before generating their actual response (Spence et al., 2001). The notion that lying takes more time than truth-telling is also supported by findings from social cognition research, which suggests that actual experiences and genuine opinions are more accessible in memory and more readily activated (Meyer & Schvaneveldt, 1976) compared to those that are fabricated (Miyake et al., 2000). This ease of

retrieval is then reflected by faster response speed and reduced delay. When lying, on the other hand, responders not only have to suppress the spontaneous and truthful thought activated by a question, but also generate an alternative answer that matches their motive, thereby delaying the response (Duran, Dale, & McNamara, 2010; Seymour & Schumacher, 2009; Suchotzki et al., 2015; Walczyk et al., 2003). Despite the abundance of research examining whether people are in fact slower to respond when the response is a dishonest one, research to date has not given a clear-cut answer as to whether response speed affects observers' *perceptions* of responder sincerity.

Response Speed and Perceived Sincerity

Given the ubiquity and importance of sincerity inferences and lie detection in everyday communication, there has been considerable scholarly interest on the relationship between perceived sincerity and a host of other variables, including response speed (sometimes also referred to as response latency or response delay in the literature; e.g., Baskett & Freedle, 1974; Hartwig & Bond, 2011; Kraut, 1978). For instance, one meta-analytical study provided evidence of a weak relationship between response speed and perceived sincerity ($r = 0.18$; Cohen, 1992), hinting that slower responses may be perceived as less sincere (Hartwig & Bond, 2011). However, a closer inspection of their meta-analysed studies reveals substantial heterogeneity in both the direction and magnitude of the relationship. While some studies find that slower responses are perceived as insincere (Vrij, Edward, & Bull, 2001), others find no statistically significant effect in either direction (Vrij, Evans, Akehurst, & Mann, 2004; Zuckerman, Koestner, & Driver, 1981), some find a curvilinear relationship between response speed and sincerity (Baskett & Freedle, 1974; Boltz, 2005), and some even find that slower responses are perceived as *more* sincere than faster ones (Kraut & Lewis, 1982).

We believe the aforementioned inconsistent findings are the result of various limitations. Methodologically, many of these studies are exploratory and correlational in nature (e.g., Kraut, 1978; Kraut & Lewis, 1982) where participants are exposed to the same material (such as a brief excerpt of a conversation from a cassette tape or a short video), and then asked to rate it on several dimensions which are then correlated. Such correlational designs make it difficult to conclude whether there is a directional and causal effect of response speed on sincerity judgments, and are also prone to effects of confounding variables. Even experimental studies suffered from the confounding problem because they mostly measured response speed and perceived sincerity as dependent variables following the manipulation of a different independent variable. Most notably, studies on deception intention would have one group of actors tell the truth and another group lie. Participants would then be asked to rate the actors on a variety of measures including response speed and perceived sincerity (Buller, Strzyzewski, & Hunsaker, 1991; Cornetto, 2002; Harrison, Hwalek, Raney, & Fritz, 1978; Stiff & Miller, 1986; Swinkels, 1991). This type of study design again precludes causal inferences to be drawn between response speed and perceived sincerity.

The uncertainty of the relationship between response speed and perceived sincerity is exacerbated further by the low statistical power of many studies in this domain. For instance, Kraut and Lewis (1982) recruited 96 participants, which implies only 50% power of detecting an effect close to the average in social psychology (Cohen's $d = 0.40$ or Pearson's $r = .20$; Richard, Bond, & Stokes-Zoota, 2003) with a typical two-tailed alpha level of 5%; Vrij, Edward, and Bull (2001) recruited 39 participants, which implies 24% power of detecting $r = .20$, both far short of the recommended 80% power level. Many studies measuring response speed and perceived sincerity also measure and correlate with each other multiple other aspects connected to perceptions of verbal and nonverbal behavior, sometimes more than

fifteen (e.g., Kraut and Lewis, 1982; Zuckerman et al., 1981), inflating the likelihood of false positives.

Taken together, previous research serves as a valuable starting point for the present investigation as it provides indirect evidence for, and hence a basis on which we can predict, the causal role of response speed in sincerity judgments. It also highlights the necessity of the present study since low statistical power, confounding factors, and diversity of study designs has precluded researchers from arriving at a conclusive answer as to the existence, nature, and causal direction of this effect. More importantly, this lack of empirical consistency hinders theoretical developments and hence meaningful investigations of the underlying mechanisms and boundary conditions of this phenomenon. Most notably, experimental studies thus far have yet to test the mechanism underlying the relationship between response speed and perceived sincerity in a direct manner (Boltz, 2005). A systematic investigation into the nature and the mechanism underlying the relationship between response speed and sincerity judgment is therefore highly necessary, for several reasons. First, to determine whether there exist a causal effect of response speed on perceived sincerity, as previous research provides inconclusive results. Second, to examine the direction of this effect, as, again, previous research points towards several directions. Finally, this work delves deep into the mechanisms and boundary conditions of the effect of response speed on sincerity judgments, which previous research could not investigate.

Are slower responses perceived as less sincere?

The literature reviewed above provides an empirical basis for the association between response speed and perceived sincerity, but is there reason to believe that response speed has a specific causal effect on perceived sincerity? We believe so - response speed is likely not only a reflection of actual sincerity, but also able to influence observers' perceptions of responder sincerity such that slower responses are perceived as less sincere. The reason for

this is twofold. First, since lying and being lied to are both frequent occurrences in people's social lives, observers should have an experience-informed lay intuition that mirrors the research findings on deception and response speed: slower responses should be perceived as less sincere than faster ones because people believe that response speed could be a reflection of underlying cognitive labor, such as the inhibition of an automatic and truthful response, or the fabrication of an alternative one. That is, individuals may feel as if slower responders are using the delay to produce a novel and untruthful answer.

Second, it has been well-documented that people rely on response speed as a social cue in a range of interpersonal judgement and impression formation processes. For instance, response speed is considered indicative of internal states and decisional readiness, such that when responders are quicker to agree to morally dubious requests, they are dealt a harsher moral judgment, and when the decision is morally virtuous, faster responders are likely to be dealt a more positive moral judgment (Critcher, Inbar, & Pizarro, 2013). A similar mechanism seems to be at play in expectations of collaboration: observers expect other participants who respond more quickly in collaborative economic games to provide more extreme responses - either very collaborative or very hostile (Evans & van de Calseyde, 2017). Faster responses are preferred in negotiations, when receiving job offers, and within client-customer relationships (Van de Calseyde, Keren, & Zeelenberg, 2014). Across these examples, people sometimes demonstrated a preference for swift responses because faster response speeds likely show greater willingness to engage and lower levels of hesitation, indecision, and doubt on the part of the responder (Van de Calseyde et al., 2014). Taken together, people seem to rely on response speed in a plethora of interpersonal judgement processes, and seem to have a rather sophisticated set of intuition relating to what response speed reflects in various social settings. This allows us to reason that sincerity could be yet another facet that people infer from others based on the social cue of response speed.

Boundary Conditions

We do not expect the effect of response speed on sincerity judgments to be universal. In fact, we expect that the effect of response speed on sincerity judgments may be attenuated if the delay can be attributed to factors other than thought suppression or answer fabrication. Further, we expect that the effect of response speed on sincerity judgments may be stronger for socially desirable responses.

Delay attribution. Our belief that slower responses are perceived to be less sincere than faster responses is predicated on the premise that the response delay is attributed to a cognitive process that is related to lying, such as thought suppression or answer fabrication. However, during social interactions, response delays can also be attributed to factors other than thought suppression or answer fabrication, such as mental effort. This is supported by research associating response speeds with mental effort. For instance, it has been shown that observers believe recommendations provided more slowly to have involved a higher degree of mental effort (Efendic, van de Calseyde, & Evans, 2020). As a result, not only can response speed sometimes be attributed to mental effort, when they are, they can also be evaluated more positively. For example, it has been found that difficult decisions are evaluated more favourably when they are made after a longer (vs. shorter) delay (Kupor et al., 2014), although the opposite happens for easy decisions. These findings underscore the potential role played by contextual factors such as response type and perceived mental effort when people are making inferences from response speed. Given this, and given that thought suppression and answer fabrication attribution are the proposed mechanisms underlying the prediction that slow responses are perceived as insincere, we expect that the main effect may be weakened if response delays are attributed to sincerity-unrelated reasons. Specifically, if people have reason to believe that the source of the response delay is mental effort rather than thought suppression or answer fabrication, they may be less likely to evaluate slower responses as less

sincere. For instance, if observers believe that the question relates to an event from the distant past, they will be more likely to attribute a slower response speed to memory effort compared to if the question pertains to a recent event.

Response social desirability. In addition to response delay attribution, we believe that the social desirability of a response may also affect the degree to which slower responses are seen as less sincere. This is because it is in people's interest to project themselves in a socially desirable (rather than undesirable) light. For instance, people are more likely to downplay negative attitudes and values, such as how much they resent being asked a favor (Crowne & Marlowe, 1960), and their materialistic values (Mick, 1996; Van Boven, Campbell, & Gilovich, 2010), rather than positive ones. Consequently, the response speed of a socially desirable response may be attributed to the inhibition of an authentic and 'raw', but socially undesirable response, as the responder needs time to decorate or 'edit' the response in a socially desirable way (Holtgraves, 2004), a process similar in nature to answer fabrication, that is, the addition of untrue details to an answer. However, when the response itself is socially undesirable to begin with, people may be less likely to believe that any form of response editing and inhibition was implemented. As such, socially undesirable responses should be more likely to be perceived as sincere, regardless of response speed. This is also consistent with empirical evidence suggesting that people who express themselves in a socially undesirable manner are ironically judged to be more sincere. For instance, while swearing is considered rude and even immoral (Jay, 2009), witnesses who use more swear words are considered more credible (Rassin & Van Der Heijden, 2005). Moreover, while politically incorrect language may be considered disrespectful to certain subgroups of the population, people employing it are perceived as more authentic (Rosenblum et al., 2019). Taken together, there is reason to believe that the effect of response speed on perceived sincerity may be reduced when the response is socially undesirable.

Automaticity

To facilitate completeness of the proposed theoretical model, in addition to establishing the basic phenomenon, its mechanism, and boundary conditions, the present research sought to answer a final question: can people voluntarily ignore response speed when making sincerity inferences if they are told to? Research has shown that people can be persuaded to discount irrelevant or invalid information in mock jury tasks, such as information gathered without a warrant (Dietvorst & Simonsohn, 2018; Kassin & Sommers, 1997). This suggests that people can indeed control what sources of evidence they allow themselves to be influenced by in the judgement process. However, response speed is not material information such as a testimony or a piece of evidence that jurors can simply disregard. Rather, it is an ever-present and integral feature of social interactions in general, and hence, likely inextricably intertwined with various forms of evidence such as interrogation videos. As such, compared to invalid evidence, response speed may be a factor that is more difficult to disentangle and ignore in the judgement process.

Study Overview

In order to test the notion that slower responses are perceived as less sincere, its proposed psychological mechanisms, and its boundary conditions, we conducted fourteen experiments (eleven presented in the main paper, and three in the Supplementary Online Material (SOM)). In Study 1a, using audio stimuli, we tested whether slower responses are considered less sincere, across several response speeds (from zero to ten seconds), actors, and scenarios. In Study 1b, using video stimuli, we tested whether people believe that slower responses are less sincere than faster ones, and are more likely to judge slower responders as guilty of the crime of which they are accused. Study 1c sought to replicate these results using vignette scenarios. In Study 2a, we tested whether the effect is mediated by thought suppression inferences in a between-subjects design. In Study 2b, we tested whether slower

responses are perceived as less sincere across a greater variety of statements, and whether the effect is mediated by thought suppression inferences in a within-subjects design. In Study 2c, we independently manipulated thought suppression inferences without manipulating response speed, in order to test their unique causal effect on sincerity perceptions. This way, Studies 2a – 2c elucidate one process underlying response speed and sincerity judgements using a "causal chain" approach. Studies 3a and 3b investigated a second mediator, answer fabrication inferences, again by using a causal chain approach. Study 3a used statistical mediation tests and Study 3b manipulated answer fabrication inferences alone and tested their unique causal effect on sincerity judgments. In Study 4, we investigated whether the effect of response speed on sincerity judgments is reduced when the response is socially undesirable. Study 5 explored the role of cognitive process attribution: when the question pertains to an event from the distant past, the effect may be attenuated, because observers may be more likely to attribute slower responses to memory effort rather than thought suppression. In Study 6, we examined the controllability of the predicted phenomenon by testing whether the effect of response speed on perceived sincerity can be mitigated when people are explicit instructed to ignore response speed in the judgment process. The SOM presents three additional studies. Study S1 replicated the main effect and our mediation results with French students. Studies S2 and S3 replicated Study 4 with different scenarios and an additional guilt judgment measure to explore the downstream effects of the predicted phenomenon.

To test the generalizability of the predicted phenomena, we attempted to increase the diversity and inclusiveness of our samples in terms of participant demographics. Specifically, we sampled members of the public from the U.S, the U.K., as well as French university students. Independent samples were used for each study reported in the present article. Sample sizes were predetermined for all studies. We did not have a strong a priori notion of the effect size we would encounter. We sought to maximize power by always employing more

than 100 participants per cell when we employed a two-cells design. This sample size implies 80% power of detecting an effect size Cohen's $d = 0.40$ (with a two-tailed $\alpha = .05$), close the average effect size in social psychology (Richard, Bond, & Stokes-Zoota, 2003). Throughout all the studies, we used an alpha level of 0.05 (5%), two-tailed. We used larger sample sizes per cell when we conducted a study with more than two cells or tested an interaction effect, as they both require a higher sample size to keep the same statistical power to detect the same effect size (Simonsohn, 2015). We also employed attention checks in some of the studies (especially those where participants needed to have functioning earphones or headphones), to ensure that participants were attentive and followed instructions, and excluded from analyses participants who failed them. Across studies, we used a variety of audio, video, and vignette stimuli depicting a range of scenarios to assuage concerns of stimuli selection bias (Judd, Westfall, & Kenny, 2012) and statistical power (Meyvis & Van Osselaer, 2018).

In order to assuage concerns for demand and conformity effects, we employed experimental procedures where participants had to spontaneously pay attention to response speed, as it was not indicated by the experimenter where their focus should be. As such, participants could rely on the actors' voice tone, pitch, and pace in some studies (e.g., Study 1a), and even clothing, attractiveness, and appearance in others (e.g., Study 6) as contextual factors. Further, in all studies using vignette scenarios, we ensured the provision of contextual elements such as gender, occupation, age, names, and background of the scenario (e.g., Study 2a and 2b), for the same realism reasons.

Raw data, analyses, complete stimuli and scenario, and preregistrations are available at https://osf.io/pqmz2/?view_only=6014182f393e4ffe89c9db435ec85ca0. Studies S1, S2, S3, additional statistical analyses, deviations from the preregistrations, and participant compensation are available in the SOM.

Table 1

The effect of response speed on sincerity judgments, study overview

Study	Sample size (sample source)	Result	Moderator
Study 1a	1197 (MTurk)	Slower responses are perceived as less sincere, audio stimuli	
Study 1b	605 (MTurk)	Slower responders are perceived as less sincere and more likely to be judged as guilty, video stimuli	
Study 1c	584 (MTurk)	Slower responders are perceived as less sincere, vignette scenario stimuli	
Study 2a	199 (Prolific)	Thought suppressions inferences mediate the effect of response speed on sincerity judgment, between-subjects	
Study 2b	600 (MTurk)	Thought suppressions inferences mediate the effect of response speed on sincerity judgment, within-subjects	Opinion share of response
Study 2c	303 (Prolific)	Causal chain study: thought suppression inferences promote perceived insincerity	
Study 3a	199 (MTurk)	Answer fabrication inferences mediate the effect of response speed on sincerity judgments	
Study 3b	202 (MTurk)	Causal chain study: answer fabrication inferences promote perceived insincerity	
Study 3	588 (MTurk)	The effect of response speed on sincerity judgment is weaker when the response is socially undesirable	Response social desirability
Study 4	800 (MTurk)	The effect of response speed on sincerity judgment is weaker when the response speed can be attributed to mental effort	Perceived mental effort associated with response; triviality of event
Study 5	605 (MTurk)	The effect of response speed on sincerity judgment is weaker when people are instructed to ignore response speed in the judgment process	Instruction to ignore the speed vs. no instructions
Study S1	275 (French students)	Conceptual replication of Study 1, with different scenarios, response speeds, and with French students as participants	-
Study S2	604 (MTurk)	Conceptual replication of Study 3, with stranger rather than friend as the actor	Response social desirability
Study S3	804 (MTurk)	Conceptual replication of Study 3: admission of guilt moderates effect	Response social desirability

Study 1a – Inferring Sincerity from Response Speed

In Study 1a, we tested the prediction that slower responses are considered less sincere than fast responses using realistic audio stimuli. This study was preregistered at http://aspredicted.org/blind.php?x=4ry7ub.

Method

Participants. We recruited 1197 participants from Mechanical Turk (727 males, 462 females, 8 preferred not to disclose, M_{age} = 37.99, SD_{age} = 12.73). The HIT description explicitly required earphones or headphones. In order to make sure that participants were listening to the audio stimuli, a snippet in which the word "Three" was spoken was presented to participants before they commenced the task. Participants were asked whether they had listened to the snippet (Yes/No), and in the next screen, they were asked which word was spoken in the initial snippet (the choices were "Four", "Seven", and "Three"). Sixty-four participants did not answer the attention check correctly and were excluded from subsequent analyses, leaving a final sample of 1133 participants (684 males, 441 females, 8 preferred not to disclose, M_{age} = 37.97, SD_{age} = 12.35).

Procedure. Participants were randomly assigned to one of six conditions (response speed; zero, one, two, three, five, ten seconds). In each condition, they were presented with four situations in randomized order – two with male actors and two with female actors, and within each gender category, two pertaining to a theft scenario and two pertaining to a taste preference scenario. This was meant to maximise generalisability across actor gender and scenario. Participants in each condition were presented four short audio snippets to listen to, each corresponding to one situation, and each including a recorded question and answer. Participants were told that each of the actors presented was either asked whether they had liked a cake a friend made or whether they had stolen money from the company in which they used to work. In each situation, the question and the answer were exactly the same (either

replying “Yes I did” in the cake scenario or “No I didn’t” in the money scenario). We first recorded sample stimuli (one per scenario). Then, we edited each snippet by inserting silent pauses of the desired duration depending on the condition in order to keep features of both questions and answers (such as tone and volume) constant.

After each audio snippet, participants were asked how sincere the person in question was (our focal dependent variable), on a scale from 1 (*not at all*) to 7 (*very much*). In the next screen, participants rated the responder’s response speed (manipulation check), on a scale from 1 (*very slow*) to 7 (*very fast*).

Results

Manipulation check. A 6 X 4 mixed-measures ANOVA[2] with response speed as between-subjects factor and scenario as within-subjects factors found a significant effect of response speed, $F(5, 1127) = 140.42$, $p < .001$, $\eta^2 = 0.315$, indicating that slower responses were perceived as such. We also found a significant effect of scenario, $F(3, 3381) = 13.22$, $p < .001$, $\eta^2 = 0.002$, indicating that the actors in some scenarios were considered faster overall, and no significant scenario by speed interaction, $F(15, 3381) = 1.63$, $p = .058$, $\eta^2 = 0.001$, giving no support to the notion that the impact of response speed on perceived speed significantly changed across scenarios. Overall, these analyses show that slower responses were in fact perceived as slower than faster responses.

[2] The analyses pertaining to the manipulation check and sincerity judgments are slightly different from the preregistered analyses. In the preregistered analyses we included response speed, actor gender and scenario as factors in a 6 X 2 X 2 ANOVA. In hindsight, we realized we could not test for gender, since we did not match the male and female actor for features such as status and attractiveness which may influence sincerity judgments, but included several scenarios for generalisability purposes. The main effect of response speed on the manipulation check and sincerity judgments is exactly the same across these and the preregistered analyses (reported in detail in the SOM).

Sincerity judgments. A 6 X 4 mixed-measures ANOVA with response speed as between-subjects factor and scenario as within-subjects factor found a significant effect of response speed, $F(5, 1127) = 14.50$, $p < .001$, $\eta^2 = 0.038$, indicating that slower responses were perceived as less sincere. We also found a significant effect of scenario, $F(3, 3381) = 133.86$, $p < .001$, $\eta^2 = 0.040$, indicating that actors in some scenarios were considered significantly more sincere than in others, and no significant scenario by response speed interaction, $F(15, 3381) = 1.46$, $p = .11$, $\eta^2 = 0.002$, giving no support to the notion that the effect of response speed on sincerity judgments systematically varied across scenarios. Overall, these analyses show that slower responses were perceived as less sincere than faster responses. Tukey-corrected post-hoc tests (we used this correction for post-hoc tests in all studies) comparing each of the response speed condition to each other (Table 2) show that, compared to an immediate response, as little as a two-second delay is sufficient to produce a sizeable and statistically significant decrease in sincerity judgments. The relationship between response speed and sincerity judgments (graphically presented in Figure 1) seems relatively linear, plateauing after a five second delay.

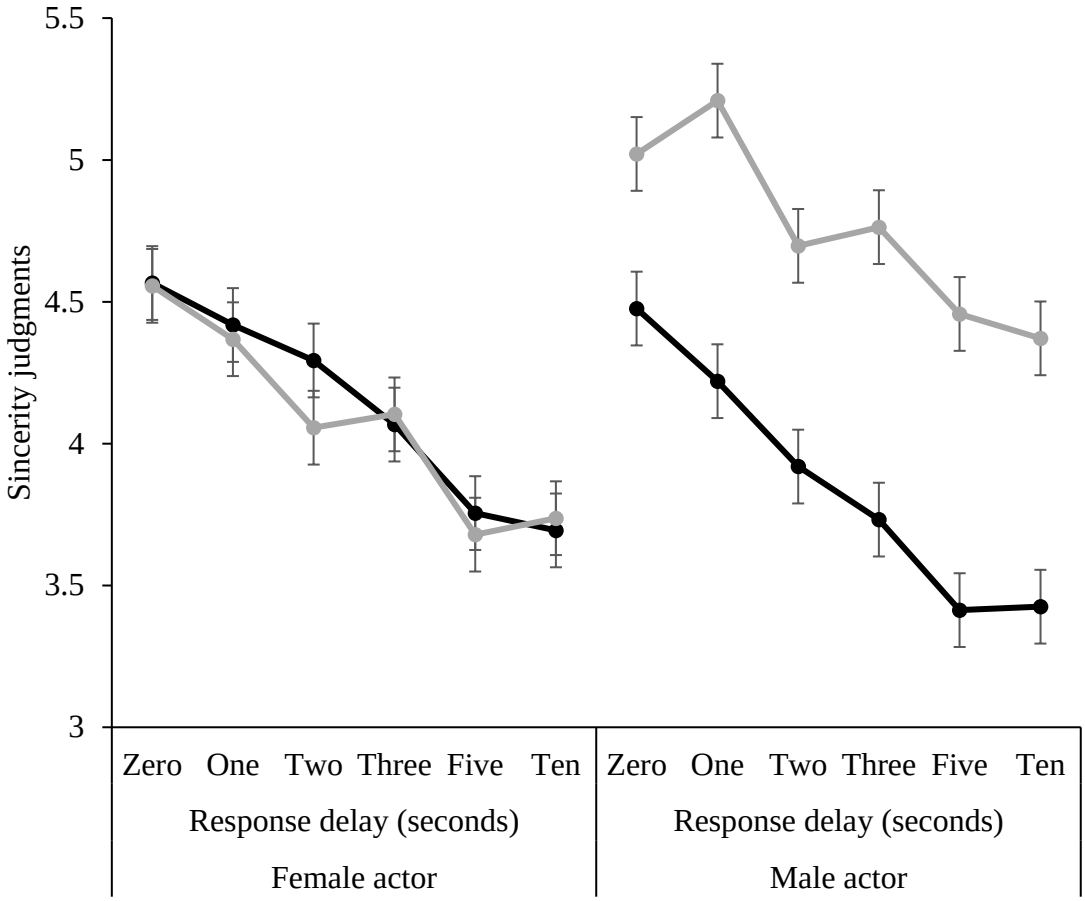

Figure 1. The impact of response speed on sincerity judgments, Study 1a. The black line indicates the "money" scenario and the grey line indicates the "cake" scenario. Error bars indicate ± one standard error around the mean.

Table 2

Tukey-corrected post-hoc comparisons testing the effect of response speed on sincerity judgments, Study 1a

Comparison			Mean Difference	SE	df	t-value	p_{tukey}
Delay (seconds)							
zero	-	one	0.101	0.132	1127.000	0.767	0.973
	-	two	0.414	0.129	1127.000	3.203	0.018
	-	three	0.489	0.130	1127.000	3.765	0.002
	-	five	0.829	0.131	1127.000	6.302	< .001
	-	ten	0.848	0.131	1127.000	6.469	< .001
one	-	two	0.312	0.130	1127.000	2.396	0.158
	-	three	0.387	0.131	1127.000	2.956	0.037
	-	five	0.727	0.133	1127.000	5.481	< .001
	-	ten	0.747	0.132	1127.000	5.644	< .001
two	-	three	0.075	0.128	1127.000	0.584	0.992
	-	five	0.415	0.130	1127.000	3.192	0.018
	-	ten	0.435	0.130	1127.000	3.353	0.011
three	-	five	0.340	0.131	1127.000	2.603	0.097
	-	ten	0.360	0.130	1127.000	2.761	0.065
five	-	ten	0.020	0.132	1127.000	0.149	1.000

Discussion

Study 1a provides initial evidence for our main proposition - slower responses are perceived as less sincere. We used realistic stimuli (audio recordings) to assuage concerns of demand effects, as participants had to spontaneously notice response speed when listening to the snippet, and it was not indicated by the experimenter. Interestingly, these results are in contrast with some prior literature, which found that, compared to extremely slow and extremely fast responses, intermediate responses were considered more sincere (Baskett & Freedle, 1974; Boltz, 2005; but see Miller 2007, for a failed replication of the curvilinear effect). However, compared to those studies, we used a larger variety of scenarios, and had higher statistical power.

Study 1b – Inferring Sincerity from Response Speed in Video

In Study 1b, we aimed to test whether the effect of response speed on sincerity judgments resulted in downstream social effects, specifically, whether slower responders who are judged as insincere are consequently more likely to be judged as guilty of an accused crime. A secondary aim of Study 1b was to test whether results of Study 1a can be replicated using video stimuli. This study was preregistered at http://aspredicted.org/blind.php?x=p5zj5p.

Method

Participants. We recruited 605 participants on Mechanical Turk (291 males, 314 females, M_{age} = 37.70, SD_{age} = 12.62). Earphones or headphones were required for this task. We used two attention check in order to ensure that participants were attentive to the presented stimuli. At the beginning of the task, participants were shown a video in which a hand with two fingers was shown and the word “cabbage” was spoken. In the next screen, participants were asked which word was spoken in the video (among “Tomato”, “Potato”, and

"Cabbage"), and how many fingers were shown in the video ("Four", "Seven", "Two"). Five-hundred and sixty-two participants correctly answered both attention checks (270 males, 292 females, M_{age} = 37.88, SD_{age} = 12.54) and their data was retained for analysis.

Procedure. Participants were randomized across two conditions, fast and slow. In each condition, they were shown two videos (in randomized order, of a man and a woman), in which they received the description that this was a police interrogation and that the person in the video was accused to having stolen a few thousand dollars from the place they worked. In the fast condition, after the question of the actor playing the police officer ("Did you steal the money?"), the actor playing the suspect immediately replied "No, I didn't!", whereas in the slow condition, the suspect replied after a delay of about five seconds.

After each video, participants completed four questions: their sincerity judgment about the statement ("What do you think about the statement?") "Sincere"; "Truthful", both anchored at 1 (*not at all*) and 7 (*very much*), further averaged in two Sincerity measures, Cronbach's α woman = .97; Cronbach's α man = .97), and a guilt judgment ("Do you think this person is guilty?" Yes/No). Finally, they completed a manipulation check measuring perceived response speed ("How was the response?"), anchored at 1 (*very slow*) to 7 (*very fast*).

Results

Manipulation check. A mixed-model ANOVA with perceived response speed as the dependent variable, actor gender as the within-subjects factor and response speed as the between-subjects factor showed a significant main effect of speed, as hypothesized (F(1, 560) = 756.629, p < .001, η^2 = . 404). On average, participants considered slower responders (M = 1.73, SD = 0.93) as slower than faster responders (M = 5.33, SD = 1.13), d = 3.49, 95% CI [3.23, 3.75]. Further, we found a significant effect of actor gender, (F(1, 560) = 33.72, p < .001, η^2 = .013) indicating that the female actor was perceived to be faster to respond; and a

significant interaction between response speed and actor gender ($F(1, 560) = 191.634$, $p < .001$, $\eta^2 = .072$), indicating that the effect of response speed on perceived response speed was relatively stronger for the male actor, yet strong and significant for both actors[3]. Descriptive statistics and effect sizes per gender are presented in Table 3.

Sincerity judgments. A mixed-model ANOVA with perceived sincerity as the dependent variable, actor gender as the within-subjects factor and response speed as the between-subjects factor showed a significant main effect of response speed, as hypothesized ($F(1, 560) = 172.37$, $p < .001$, $\eta^2 = .177$). On average, participants considered the slower responder ($M = 2.44$, $SD = 1.23$) as less sincere than the faster responder ($M = 3.84$, $SD = 1.30$), $d = 1.08$, 95% CI [0.90, 1.26]. Further, we found a significant effect of actor gender, ($F(1, 560) = 17.40$, $p < .001$, $\eta^2 = .007$) indicating that the female actor was perceived as more sincere in general; and no significant interaction between response speed and actor gender ($F(1, 560) = .02$, $p = .89$, $\eta^2 < .001$). Descriptive statistics and effect sizes per actor gender are presented in Table 3.

Guilt judgment. A repeated-measures logistic regression with gender as a within-subjects factor and response speed as between-subjects factor showed a significant effect of response speed, χ^2 (1) = 122.52, $p < .001$, as hypothesized. In total, participants considered the faster actor guilty 40% of the time (223/558 of choices), and the slower actor guilty 73% of the time (416/566 of total choices). Further, we found a significant effect of actor gender, χ^2 (1) = 9.70, $p = .002$, indicating that overall, the woman was less likely to be considered guilty compared the man; and no significant actor gender by response speed mixed interaction, χ^2 (1)

[3] In this study, we found an effect of gender and a stronger effect of response speed for the male actor. However, we caution against over interpreting these results as we presented different actors in different scenarios for generalisability purposes, not in order to test the effect of gender per se, which would require more accurate matching of the male and the female actors and scenarios.

< .001, p = .99. Descriptive statistics and effect sizes per actor gender are presented in Table 3.

Table 3

The effect of response speed on sincerity and guilt judgment, Study 1b

	Male actor			Female actor		
	Fast M (SD)	Slow M (SD)	Effect size [95% CI]	Fast M (SD)	Slow M (SD)	Effect size [95% CI]
Speed (manipulation check)	5.52 (1.41)	1.76 (1.07)	d = 3.00 [2.76, 3.24]	5.15 (1.44)	1.76 (1.07)	d = 2.74 [2.51. 2.97]
Sincerity judgments	3.70 (1.61)	2.30 (1.29)	d = 0.96 [0.78, 1.13]	3.99 (1.63)	2.58 (1.49)	d = 0.91 [0.74, 1.08]
Guilt judgment	125/279 (45%)	219/283 (77%)	φ = .33*	98/279 (35%)	197/283 (70%)	φ = .35*

* no accepted method to calculate 95% confidence interval around Cramer's φ

Discussion

Study 1b provides additional evidence for our central claim. Using video stimuli, we showed that response speed not only influences sincerity inferences, but also has downstream effects on perceptions of guilt in interrogation contexts. Actors responding after a five second delay were perceived as significantly less sincere, and consequently more likely to be guilty, compared to actors responding immediately.

Study 1c – Varying Response Speed in a Vignette Scenario

Thus far, we have demonstrated the basic prediction that slower responses are perceived to be less sincere using audio and video stimuli. Study 1c aimed to replicate the basic effect using vignette scenarios. This study was preregistered at http://aspredicted.org/blind.php?x=5aw8dj.

Method

Participants. We recruited 584 participants from Amazon Mechanical Turk (372 males, 210 females, 2 preferred not to disclose, M_{age} = 38.19, SD_{age} = 12.11). Fifty participants replied "Yes" to the question "Have you ever read a fatal heart attack?" (presented at the end of the survey) and were therefore excluded from analyses, leaving a valid sample of 534 participants (328 males, 204 females, 2 preferred not to disclose, M_{age} = 38.05, SD_{age} = 11.44).

Procedure. We randomly assigned participants to one of three conditions (immediate, two seconds delay, five seconds delay), where we varied the response speed of the actor. Participants read the following scenario (in brackets, the corresponding scripts for the two second delay and five second delay conditions):

> Maria is a woman in her forties. She is asked by a friend if she liked the movie they just saw together.
>
> Maria immediately [waits two seconds/waits five seconds] replies: "Yes, I did!"

Participants then rated how sincere Maria was, on a scale ranging from 1 (*not at all*) to 7 (*very much*). In the next and final screen, participants completed a manipulation check by rating how fast Maria's response was, on a scale ranging from 1 (*very slow*) to 7 (*very fast*).

Results

Manipulation check. A one-way ANOVA found a significant effect of actual response speed on perceived response speed, $F(2, 531) = 140.18$, $p < .001$, $\eta^2 = 0.346$. Tukey-corrected post-hoc tests showed that participants rated the responder as faster in the

immediate condition (M = 6.20, SD = 0.95) compared to the two second delay condition (M = 4.37, SD = 1.80), $t(531) = -11.59$, $p < .001$, $d = 1.29$, 95% CI [1.07, 1.51], and compared to the five seconds delay condition (M = 3.55, SD = 1.80), $t(531) = -16.06$, $p < .001$, $d = 1.91$, 95% CI [1.66, 2.16]. Further, participants rated the responder as slower in the five second delay condition compared to the two second delay condition, $t(531) = -4.87$, $p < .001$, d = 0.46, 95% CI [0.24, 0.68].

Sincerity judgments. A one-way ANOVA with response speed as the between-subjects factor found a significant effect of response speed on sincerity judgments, $F(2, 531) = 36.55$, $p < .001$, $\eta^2 = 0.121$. Tukey-corrected post-hoc tests showed that compared to the immediate response condition (M = 5.93, SD = 1.02), participants rated the responder as less sincere in the two-second delay condition (M = 5.10, SD = 1.40), $t(531) = -5.97$, $p < .001$, d = 0.68, 95% CI [0.47, 0.88] , and in the five-second delay condition (M = 4.75, SD = 1.61), $t(531) = --8.18$, $p < .001$, $d = 0.90$, 95% CI [0.68, 1.12]. Participants further thought that the responder was less sincere in the five-second delay compared to the two-second delay, $t(531) = -2.42$, $p = 0.042$, $d = 0.24$, 95% CI [0.03, 0.45].

Discussion

This study shows that responses are considered less sincere if delivered after a delay as brief as two seconds, and that responses delivered after a 5 second delay were seen as even more insincere. These results not only consolidate the findings of Studies 1a and 1b, but also provide generality to our effect through the use of vignette scenario stimuli. This is important because it suggests that people are indeed sensitive to response speed as a cue on which to base their sincerity inferences, and that the findings of Studies 1a and 1b were not simply due to the conspicuous nature of the response delays. Study S1 (SOM) replicates the main effect of response speed on sincerity judgments with a French student sample, confirming its generalizability to a different country and population. In the next three studies (2a, 2b, and

2c), we sought to systematically test the mediational role of thought suppression inferences in the causal relationship between response speed and sincerity perception using a causal chain approach. We did this by using a between-subjects mediation analysis (Study 2a), within-subjects mediation analysis (Study 2b), and a sole manipulation of the mediator (Study 2c).

Study 2a – Slower Responders Are Perceived as Less Sincere Because Observers Infer Thought Suppression, Between-Subjects

The objective of this study was to test whether thought suppression inferences mediate the effect of response speed on sincerity judgments. This study was preregistered at http://aspredicted.org/blind.php?x=a93tx5.

Method

Participants. We recruited 199 U.K. nationals from Prolific. One participant failed the attention check at the end of the survey, replying, “Yes” to the question “Have you ever been to your own funeral?” which left a final sample of 198 participants (92 males, 104 females, 2 other, M_{age} = 36.30, SD_{age} = 13.47).

Procedure. Participants were randomly assigned to one of two conditions, fast and slow. In both conditions, they read about a woman named Michelle, who responded either immediately or after two seconds to a friend’s question. Participants read the following scenario (in brackets, the slow condition):

> Michelle is a woman in her 30s. She works as a copy-writer in New York. She is tall and dark-haired.
>
> One night, Michelle goes to the movies with a friend, to watch a movie they both have never seen before.
>
> Michelle is asked by her friend if she likes the movie that they are watching.
>
> Michelle immediately (waits 2 seconds and) replies: "Yes, I do"

Participants were then asked to rate Michelle's sincerity ("How sincere was Michelle?"), whether they believed that Michelle was suppressing another thought ("Do you think Michelle was suppressing another thought?"), and, as a manipulation check, how they judged the speed of Michelle's response ("How fast was Michelle in replying?"), all on items anchored at 1 (*not at all*) and 7 (*very much*).

Results

Manipulation check. Participants rated the delayed response (M = 3.79, SD = 1.61) as slower than the immediate response (M = 5.95, SD = 1.31), $t(196) = 10.41$, $p < .001$, $d = 1.48$.

Sincerity judgments. Participants rated the delayed response (M = 4.35, SD = 1.44), as less sincere than the immediate response (M = 5.20, SD = 1.38), $t(196) = 4.25$, $p < .001$, $d = 0.61$.

Thought suppression inferences. Participants were more likely to believe that Michelle was suppressing another thought when she gave a delayed response (M = 3.67, SD = 1.60) compared to when she gave an immediate response (M = 2.83, SD = 1.40), $t(196) = 3.96$, $p < .001$, $d = 0.56$.

Mediation analysis. A mediation analysis conducted with PROCESS for SPSS v3.1 (5,000 bootstraps) model 4, with response speed as the independent variable, thought suppression inferences as the mediator, and sincerity judgments as the dependent variable found a significant indirect effect of response speed on sincerity judgments through thought suppression inferences, ab (SE) = 0.37 (0.11), 95% CI [0.17, 0.60].

Discussion

Results of Study 2a show that observers believe that responders who responded after a delay are more likely to have suppressed another thought. In turn, observers rate slower

responses as less sincere. This study provides evidence in line with the notion that thought suppression inferences underlie the effect of response speed on sincerity judgments.

Study 2b – Slower Responders Are Perceived as Less Sincere Because Observers Infer Thought Suppression, Within-Subjects

As with Study 2a, the primary goal of Study 2b was to test whether people perceive slower responses to be less sincere because the response delay is attributed to the responder suppressing another thought, this time using a within-subjects experimental design. Study 2b also aimed to investigate whether the social desirability of a response is a boundary parameter of the effect of response speed on perceived sincerity. We predict that if the response is socially undesirable (e.g., a minority opinion), the effect of response speed on perceived sincerity will be attenuated, as people often intentionally inhibit spontaneous responses and deliberate their response in order to make it more, not less, socially desirable (Crowne & Marlowe, 1960). Consequently, socially undesirable responses may be considered more authentic, less deliberated, and hence more sincere (Rosenblum et al., 2019). Finally, Study 2 tested whether the main effect of response speed on sincerity judgments is robust to a change to a within-subjects design (Lambdin & Shaffer, 2009).

Given that Study 2b had a number of aims, we sought to maximise power in order to facilitate the detection of predicted effects (Pieters, 2017; Simonsohn, 2015). To achieve this, in addition to recruiting a sufficiently large sample, we also employed a longer delay duration – 10 seconds. This is because our studies so far have only tested the effects of delays ranging from one to five seconds, and from the results of these studies it seems that longer response delays engendered a larger effect of response speed on sincerity judgments. Employing a 10 second response delay also allows us to explore whether the predicted effect manifests for longer response delays.

Method

Participants and procedure. We recruited 600 participants from Mechanical Turk (328 females and 272 males; M_{age} = 38.63, SD_{age} = 14.05). We manipulated one factor between-subjects (opinion share), thereby randomly assigning participants to one of two conditions (minority and majority), and two factors within-participants: response speed (fast vs. slow) and scenario (four scenarios: Cola, Italian election, California election, and Sweaters). In the minority condition, participants replied that they liked the element also preferred by the minority; in the majority condition, that they liked the element also preferred by the majority. In each condition, participants were presented four scenarios. In each scenario, two interviewees were asked about their preferences for one of two objects (one also preferred by a majority, and a second one preferred by a minority), in a wide range of topics ranging from their electoral preferences (in the USA and in Italy – California election and Italian election scenarios), to their soft drinks preferences (Cola scenario), to their clothing preferences (Sweaters scenario). The first interviewee responded immediately (fast), and the second one after a 10 seconds delay (slow). Complete scenarios are available in the SOM.

After reading the scenarios, participants were asked to estimate how 'Sincere' responders were, and how much they 'Meant what they said' on scales from 1= *Not at all* to 7 = *Very much*, which showed high reliability (all αs > .80) for all four scenarios and therefore averaged for each scenario, resulting in eight sincerity judgments. Participants were also asked – per scenario – to rate the sentence "Another thought popped up in his/her head", anchored at 1 = *Not at all* and 7 = *Very much*, as a measure of thought suppression inferences.

Results

Sincerity judgments. A mixed-model ANOVA with response speed (fast vs. slow) and scenario (High School; Cola; Party; Election) as within-subjects factors, opinion share (majority vs. minority) as between-subjects factor, and sincerity judgments as dependent

variable found a significant effect for response speed, $F(1, 598) = 488.17$, $p < .001$, $\eta^2 = .203$. On average, slower responders were considered less sincere ($M = 4.42$, $SD = 1.44$) than faster responders ($M = 5.89$, $SD = 1.09$), $d = 0.90$, 95% CI [0.73, 1.07]. Further, the ANOVA found significant effects for scenario, $F(3, 1794) = 4.52$, $p = .004$, $\eta^2 = .001$, indicating that the responses were considered more sincere in some scenarios, and for the interaction between response speed and scenario, $F(3, 1794) = 6.91$, $p < .001$, $\eta^2 = .001$, indicating that the effect size varied across scenarios (while remaining statistically significant and in the same direction). No significant effect was found for the interaction between response speed and opinion share, $F(1, 598) = 0.03$, $p = .87$, for the three-way mixed interaction between response speed, scenario, and opinion share, $F(1, 1794) = 1.45$, $p = .23$, and the between-subjects main effect of opinion share, $F(1, 598) = 0.01$, $p = .91$, all with $\eta^2 < .001$. Descriptive statistics and effect sizes per scenario are presented in Table 4.

Thought suppression inferences. A mixed-model ANOVA with response speed (fast vs. slow) and scenario (High School; Cola; Party; Election) as within-subjects factors, opinion share (majority vs. minority) as between-subjects factor, and thought suppression inferences as dependent variable found a significant effect for response speed, $F(1, 598) = 509.66$, $p < .001$, $\eta^2 = .247$. On average, participants were more likely to think that participants were suppressing a thought if they replied slower ($M = 4.77$, $SD = 1.43$) compared to when they replied faster ($M = 2.67$, $SD = 1.74$), $d = 0.92$, 95% CI [0.75, 1.09]. The ANOVA also found significant main effects for scenario, $F(3, 1794) = 3.67$, $p = .012$, $\eta^2 = .001$, indicating that on average, participants were considered more sincere in some scenarios, and for the interaction between share and scenario, $F(3, 1794) = 2.91$, $p = .033$, $\eta^2 < .001$, indicating a small change in the effect of opinion share in different scenarios. The main effect of opinion share, $F(1,598) = 2.16$, $p = .14$, the two-way interaction between response speed and opinion share, $F(3, 1794) = 1.09$, $p = .30$, and the three-way interaction between response speed, scenario,

and opinion share, $F(3, 1794) = 1.09$, $p = .35$, were not statistically significant, all yielding an effect size $\eta^2 < .001$. Descriptive statistics and effect sizes per scenario are presented in Table 4.

Mediation analysis. Within-subjects mediation analysis using the MEMORE macro for SPSS (Montoya & Hayes, 2017, 5000 bootstraps), showed a significant indirect effect of response speed (pseudo-independent variable) on the average of sincerity judgments (dependent variable) through the average measure of thought suppression inferences (mediator), ab (SE) = 0.85 (0.09), 95% CI [0.67; 1.04], providing statistical evidence for our theoretical model, and supporting the notion that the effect of response speed on sincerity judgments is driven by thought suppression inferences.

Table 4

Results of Study 2. Sincerity judgements across response delays and vignette scenarios

	Sincerity judgments			Thought suppression inferences		
Vignette scenario	Fast M (SD)	Slow M (SD)	Cohen's *d* [95 % CI]	Fast M (SD)	Slow M (SD)	Cohen's *d* [95 % CI]
Cola	5.79 (1.27)	4.46 (1.54)	0.72 [0.55, 0.88]	2.57 (1.92)	4.69 (1.46)	0.96 [0.79, 1.13]
Italian elections	5.90 (1.24)	4.32 (1.67)	0.80 [0.63, 0.97]	2.65 (1.98)	4.84 (1.69)	0.82 [0.65, 0.99]
High school	5.93 (1.23)	4.52 (1.64)	0.77 [0.60, 0.94]	2.64 (1.92)	4.75 (1.70)	0.82 [0.65, 0.99]
California elections	5.95 (1.22)	4.39 (1.73)	0.82 [0.65, 0.99]	2.61 (1.98)	4.70 (1.73)	0.79 [0.62, 0.96]
Average	5.89 (1.09)	4.42 (1.44)	0.90 [0.73, 1.07]	2.67 (1.74)	4.77 (1.43)	0.92 [0.75, 1.09]

Note. All differences between the slow and the fast condition were significant, $p < .001$.

Discussion

Results of Study 2b suggest that slow responses are perceived as less sincere because observers infer that slow responders are more likely to be suppressing an alternative thought. Further, it does not seem that the opinion share moderates the effect. Finally, findings of Study 2b also suggest that the effect of response speed on perceived sincerity is observed even

when the same observer rated both the slow and the fast responder, and even for longer response delays. Study S1 in the SOM replicates both the main effect and the mediation results of Studies 2a-2b using a between-subjects design.

Study 2c – Testing the Unique Causal Effect of Thought Suppression Inferences on Sincerity Judgments

A limitation of Studies 2a and 2b is that while thought suppression inferences were analysed as the mediator, it was measured along with the dependent measure. As such, whether or not thought suppression inferences per se have a causal effect on sincerity judgements remains to be tested. To this end, Study 2c was conducted. We manipulated thought suppression inferences without manipulating response speed to provide stronger evidence for the directional and causal role of thought suppression inferences on sincerity judgments. This study was preregistered at http://aspredicted.org/blind.php?x=zd9ky2.

Method

Participants and procedure. We recruited 303 members of the British public on Prolific (146 males, 155 females, 2 other/prefer not to disclose; M_{age} = 31.12, SD_{age} = 10.05). Participants were randomly assigned to one of two conditions, control and thought suppression. They were presented the following scenario, containing the description of the response of a woman to a mundane question (in brackets, the text added in the thought suppression condition and absent in the control condition):

> Michelle is a woman in her 30s.
>
> Michelle is asked by a friend if she likes the movie that they are watching.
>
> [Michelle seems to be suppressing another thought when replying.]
>
> Michelle replies: "Yes, I do"

Then, participants rated Michelle's sincerity on a scale from 1 (*not at all*) to 7 (*very much*), and, as a manipulation check (presented in the next screen), they rated whether she seemed to be suppressing another thought, also on a scale from 1 (*not at all*) to 7 (*very much*).

Results

Thought suppression inferences. Michelle was rated as more likely to be suppressing a thought in the thought suppression condition (M = 5.25, SD = 1.14) compared to the control condition (M = 3.52, SD = 1.55), $t(301) = 11.04$, $p < .001$, d = 1.27, 95% CI [1.02, 1.52].

Sincerity judgments. Michelle was rated as less sincere in the thought suppression condition (M = 3.31, SD = 1.17) compared to the control condition (M = 4.97, SD = 1.28), $t(301) = 11.79$, $p < .001$, d = 1.35, 95% CI [1.10, 1.60].

Discussion

Results of Study 2c show that individuals suppressing another thought while responding (as compared to those not suppressing another thought) are perceived as less sincere. This result strengthens our theoretical model by showing that thought suppression inferences is indeed a causal mechanism driving observers' sincerity judgments. Findings of Study 2c also augment the findings of Studies 2a and 2b by demonstrating a causal chain. Specifically, while Studies 2a and 2b showed that the predictor (response speed) affects both the mediator (thought suppression inferences) and the dependent variable (perceived sincerity), Study 2c showed that the mediator has an independent causal effect on the dependent variable. Many effects in social psychology are multiply mediated, and we do not expect thought suppression to be the one and only inference generated by response speed that, in turn, promotes insincerity judgments. In the next two studies, we test whether a second mediator – answer fabrication inferences - may also underlie our effect.

Study 3a – The Mediating Role of Answer Fabrication Inferences

The objective of this study was to test whether the effect of response speed on sincerity judgments can be mediated by answer fabrication inferences. This study was preregistered at https://aspredicted.org/blind.php?x=ic96x3.

Method

Participants and attention check. We recruited 199 participants from MTurk (97 males, 99 females, 2 other, 1 preferred not to disclose, M_{age} = 40.09, SD_{age} = 11.44). 12 participants failed the attention check at the end of the survey, by replying “Yes” to the question “Have you ever been to your own funeral?”. This left 187 valid participants (90 males, 94 females, 2 other, 1 preferred not to disclose, M_{age} = 40.42, SD_{age} = 11.61).

Procedure. Participants read a scenario in which a woman was asked a question and replied either immediately or after a short pause. Participants read this scenario (in the fast condition, they also read the additional text in round brackets; in the slow condition, they did not read the text in round brackets, but read the additional text in square brackets).

> Michelle is a woman in her 30s, who works as a software developer in Plano, Texas, but is originally from Butte, Montana.
>
> She is taller than average and likes to dress in black. Over the years, she acquired a slight Texas drawl.
>
> Michelle is asked by a friend if she likes the play that they are watching together, "Cats".
>
> Michelle (immediately) replies [after 3 seconds]: "Yes, I do"

Measures. Participants were then asked four questions, each anchored at 1 (*not at all*) and 7 (*very much*). First, they were asked how sincere they believed Michelle was ("How sincere was Michelle?"); then, they were asked whether they believed that Michelle had to come up with an improvised response and whether they believed that Michelle had to invent an answer on the spot ("Do you think Michelle had to come up with an improvised response?"; "Do you think Michelle had to invent an answer on the spot?".) These two items were intended as a measure of answer fabrication. Since they showed very high correlation (Pearson's $r = .85$, $p < .001$), they were averaged in an answer fabrication index. Finally, as a manipulation check, they were asked how fast Michelle's response was ("How fast was Michelle in responding?")

Results

Manipulation check. Participants rated Michelle as faster when she replied immediately ($M = 6.39$, $SD = 0.89$) compared to when she replied after three seconds ($M = 3.82$, $SD = 1.69$), $t(185) = 13.16$, $p < .001$, $d = 1.93$, 95% CI [1.58, 2.28].

Sincerity judgments. Participants rated Michelle as more sincere when she replied immediately ($M = 4.82$, $SD = 1.42$) compared to when she replied after three seconds ($M = 5.70$, $SD = 1.14$), $t(185) = 4.71$, $p < .001$, $d = 0.69$, 95% CI [0.39, 0.98].

Answer fabrication inferences. Participants were more likely to rate Michelle as fabricating an answer when she replied after three seconds ($M = 3.29$, $SD = 1.80$) compared to when she replied immediately ($M = 2.31$, $SD = 1.59$), $t(185) = 3.93$, $p < .001$, $d = 0.58$, 95% CI [0.29, 0.87].

Mediation. A mediation analysis (PROCESS v3.5 for SPSS, 5000 bootstraps) with response speed as the independent variable, answer fabrication impressions as the mediator, and sincerity judgments as the dependent variable found a significant indirect effect, ab (SE)

= -0.40 (0.12), 95% CI [-0.66, -0.17]. This supports the notions that observers perceive slower responders to be less sincere because they believe the response delay is the result of the responder fabricating their response.

Discussion

Study 3a replicates the main effect investigated in this paper, and also shows that people believe that slower responders are more likely to be fabricating answers. Furthermore, Study 3a shows that in addition to thought suppression inferences, the effect of response speed on sincerity judgments is also mediated by answer fabrication inferences.

Study 3a therefore contributes to the present work in two ways. First, we establish another cognitive process that, in addition to thought suppression, people infer from response speed. Second, we show that this cognitive process mediates sincerity judgments engendered by response speed, adding considerable nuance to the mediating mechanism we proposed in this paper. Next, to better carve out the causal nature of answer fabrication inferences as an additional mediator, we test whether answer fabrication inferences alone have a causal effect on sincerity judgments.

Study 3b – Testing the Unique Causal Effect of Answer Fabrication Inferences on Sincerity Judgments

Study 3b was preregistered at https://aspredicted.org/blind.php?x=fg435a.

Method

Participants and attention checks. We recruited 202 participants from MTurk (96 males, 103 females, 1 other, 2 preferred not to disclose, M_{age} = 38.23, SD_{age} = 11.28). Eleven participants failed the attention check at the end of the survey, by replying “Yes” to the question “Have you ever been to your own funeral?”. This left 191 valid participants (92 males, 96 females, 1 other, 2 preferred not to disclose, M_{age} = 38.56, SD_{age} = 11.45).

Procedure. Participants were randomly assigned to one of two conditions, control and fabrication. They read a version of the following scenario (specifically, participants in the fabrication condition also read the sentence in brackets, while those in the control condition did not):

> Michelle is a woman in her 30s, who works as a software developer in Plano, Texas, but is originally from Butte, Montana.
>
> She is taller than average and likes to dress in black. Over the years, she acquired a slight Texas drawl.
>
> Michelle is asked by a friend if she likes the play that they are watching together.
>
> [Michelle seems to be coming up with an improvised thought when responding.]
>
> Michelle replies: "Yes, I do":

Measures. Participants were then asked three questions, each anchored at 1 (*not at all*) and 7 (*very much*), taken from Study 3a. First, they were asked how sincere they believed Michelle was ("How sincere was Michelle?"); then, they were asked whether they believed that Michelle had to come up with an improvised response and whether they believed that Michelle had to invent an answer on the spot ("Do you think Michelle had to come up with an improvised response?"; "Do you think Michelle had to invent an answer on the spot?".). These two items were intended as a measure of answer fabrication impressions, which in this case was used as a manipulation check. Since they showed very high correlation (Pearson's $r = .81$, $p < .001$), they were averaged in an answer fabrication index.

Results

Manipulation check. Participants believed that Michelle was more likely to be fabricating an answer in the fabrication condition ($M = 4.04$, $SD = 1.63$) compared to the

control condition (M = 2.27, SD = 1.40), $t(189) = 8.06$, $p < .001$, d = 1.17, 95% CI [0.86, 1.48].

Sincerity judgments. Participants believed that Michelle was less sincere in the fabrication condition (M = 4.26, SD = 1.65) compared to the control condition (M = 5.65, SD = 1.06), t(189) = -7.05, $p < .001$, d = -1.02, 95% CI [-1.32, -0.72].

Discussion

Study 3b shows that people who are seen as improvising their response are perceived as less sincere. This again completes the causal chain by showing an effect of a candidate mediator (answer fabrication inferences) on the dependent variable (sincerity judgments) without the measurement or manipulation of the independent variable (response speed). Next, we investigate boundary conditions for the effect of response speed on sincerity perceptions.

Study 4 – Sincerity Judgements of Socially Undesirable Responses Are Less Affected by Response Speed

A limitation of Study 2b was that we had conflated opinion share (majority vs. minority) with social desirability. To test the role of social desirability in the predicted relationship more accurately, Study 4 was conducted.

Method

Participants. We recruited 588 participants on Mechanical Turk (327 females, 261 males, M_{age} = 39.68, SD_{age} = 14.87). We randomly assigned participants to one of four conditions in a 2 (response speed: fast vs. slow) X 2 (social undesirability of the response: desirable vs. undesirable) between-subjects design. All participants were asked to write down the initials of their best friend at the beginning of the survey. Then, they were asked to read a vignette in which they asked their best friend for his or her opinion, to which their best friend would reply either immediately (fast condition) or after a 15 second delay (slow condition),

giving either a socially desirable (“it’s really good”) or socially undesirable (“it’s really bad”) response. Participants read one of the four versions of the following scenario (the slow and the socially undesirable variants are presented in brackets):

> Imagine you have made a cake for a party. You are unsure if people will like it. Your best friend tastes it and you ask him/her for his/her opinion.
>
> He/she immediately (after 15 seconds) replies: "It's really good (really bad)!"

Participants were then asked four questions in randomized order, which included the focal measure of perceived sincerity (“Do you think your best friend was sincere in this occasion?” on a scale from 1 (*Not at all*) to 7 (*Very much*)). Two were manipulation checks, for response speed (“How fast was your friend in replying?”) on a scale from 1 (*Very slow*) to 7 (*Very fast*) and for social desirability (“Was the answer positive or negative?”) on a scale from 1 (*Very negative*) to 7 (*Very positive*). As an additional check, we also measured perceived social desirability (“Did your friend risk upsetting you with this answer?”) on a scale from 1 (*Not at all*) to 7 (*Very much*), to ascertain whether the negative response was in fact more socially undesirable than the positive one.

Results

Manipulation check, response speed. Participants were perceived to be slower in the slow condition, (M = 3.72, SD = 1.77), compared to the fast condition, (M = 6.31, SD = 1.07), $t(586)=-21.48$, $p < .001$, d = 1.77, 95% CI [1.58, 1.96].

Manipulation check, response valence. Answers were perceived more negative when socially undesirable (M = 2.33, SD = 1.81) compared to when they were socially desirable, (M = 5.89, SD = 1.34), $t(586)= -27.12$, $p < .001$, d = 2.23, 95% CI [2.02, 2.44].

Manipulation check, social desirability. Negative responses were in fact perceived as more socially undesirable (M = 4.17, SD = 2.06) compared to positive responses (M = 2.68, SD = 1.84), $t(586) = 9.22$, $p < .001$, d = 0.76, 95% CI [0.59, 0.93].

Sincerity judgments. A 2 X 2 ANOVA with social desirability and response speed as between-subjects factors found the predicted two-way interaction between response speed and politeness, $F(1,584) = 10.00$, $p = .002$, $\eta^2 = .015$. Tukey-corrected post-hoc tests show that when the response was socially desirable, slow responses (M = 4.84, SD = 1.66) were considered less sincere than fast responses (M = 6.01, SD = 1.14, $t(584) = -7.04$, $p < .001$, d = 0.81, 95% CI [0.57, 1.05]), but when the response was socially undesirable, the difference between slow responses (M = 5.78, SD = 1.54) and fast responses, (M = 6.21, SD = 1.28) was reduced, $t(584) = -2.59$, $p = .049$, d = 0.30, 95% CI [0.07, 0.53]. Descriptive statistics are depicted in Figure 2.

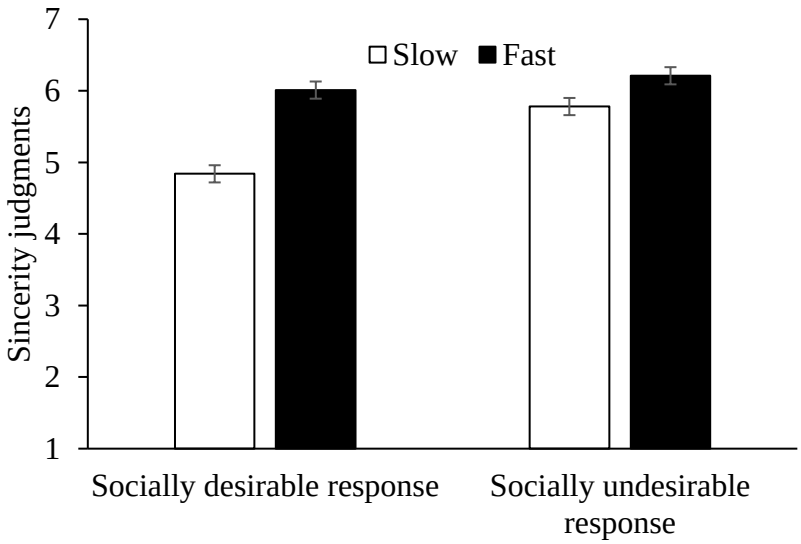

Figure 2. The effect of response speed and response social desirability on sincerity judgments, study 4. Error bars represent ± one standard error around the mean.

Discussion

The results of Study 4 add an important boundary condition to our theoretical model. Specifically, while response speed seems to play a significant role in sincerity inferences if the response is socially desirable, the magnitude of this influence is much smaller when the response is socially undesirable. Studies S2 and S3 in the SOM replicate this study with different vignette scenarios and actors and extend it to guilt judgments.

In a similar vein, another important boundary condition to examine is that of delay attribution. If people have reason to believe that the response delay is not the result of a cognitive process related to insincerity such as thought suppression or answer fabrication but a different reason, such as memory effort, they may be less likely to judge slower responders as insincere. We test this prediction in Study 5.

Study 5 – Perceived Memory Effort Moderates the Effect of Response Speed on Perceived Sincerity

Study 5 was preregistered at http://aspredicted.org/blind.php?x=dx2n3q.

Method

Participants and procedure. We recruited 800 participants from MTurk (428 males, 372 females, M_{age} = 38.21, SD_{age} = 12.34). Participants were randomly assigned to one of eight conditions in a 2 (response speed: fast vs. slow) X 2 (distance in time of the violation: recent past vs. distant past) X 2 (severity of the violation: low vs. high) between-subjects design. In each condition, participants were presented with a vignette in which a man named John was asked whether he had murdered a man (high severity) or stolen some candy (low severity), either earlier the same day (recent past) or 10 years ago (distant past), to which John responded “No, I didn’t” either immediately (fast) or after a 10 second delay (slow).

Participants read a scenario as below (in square brackets, the high severity condition, the distant past condition and the fast condition variants of the scenario):

> John is accused of having stolen some candy [murdered a man] earlier today [10 years ago]. He is asked whether he did it and after about 10 seconds [immediately] he replies: "No, I didn't!"

Participants were then asked eight questions, all on 7-point scales ranging from 1 (*Not at all*) to 7 (*Very much*). These included first the focal dependent variable, perceived sincerity ("How sincere was John?"); followed by the measure of thought suppression inferences ("Was John suppressing any other thoughts when responding?"); perceived memory effort ("Was John trying to remember whether he did what he was accused of or not?"); and perceived ease of retrieval ("Was the event John was asked about easy to remember?"). Finally, participants completed three manipulation checks, one for response speed ("How fast was John's response?"), one for violation severity ("How serious is the violation of which John is accused?"), and one for distance in time ("How far ago in the past was the action that John was asked about?").

Results

Manipulation check, response speed. A t-test using response speed as the independent variable confirmed the success of our manipulation, as slower responses (M = 3.42, SD = 2.02) were perceived as slower than faster responses (M = 6.28, SD = 1.12), Welch's $t(621.044) = -24.71$, $p < .001$, $d = 1.75$, 95% CI [1.59, 1.91].

Manipulation check, violation severity. A t-test using violation severity as the independent variable confirmed the success of our manipulation, as stealing some candy (M = 3.61, SD = 1.80) was considered less severe than murdering someone (M = 6.52, SD = 1.00), Welch's $t(624.55) = -28.20$, $p < .001$, $d = 1.99$, 95% CI [1.82, 2.16].

Manipulation check, temporal distance. A t-test using distance in time as the independent variable confirmed the success of our manipulation, as the violation committed earlier the next day (M = 2.69, SD = 1.75) was considered less distant in the past than the violation committed ten years earlier (M = 5.62, SD = 1.34), Welch's $t(753.22) = -26.59$, $p < .001$, d = 1.88, 95% CI [1.71, 2.05].

Sincerity judgments. A 2 X 2 X 2 between-subjects ANOVA found the predicted three-way interaction between response speed, violation severity and temporal distance, ($F(1, 792) = 3.94$, $p = .048$, $\eta^2 = .004$), indicating that the effect of response speed was significantly smaller and not statistically significant when the violation was of low severity and had been committed a long time ago. When the violation had low severity and was committed in the recent past (stealing candy earlier the same day), slower responders (M = 3.03, SD = 1.63) were rated as less sincere than faster responders (M = 4.65, SD = 1.73, $t(792) = -7.10$, $p < .001$, d = 0.97, 95% CI [0.69, 1.25]); when the violation was low in severity and committed in the distant past, we found a smaller and non-significant difference between slower (M = 3.61, SD = 1.74) and faster responders (M = 4.07, SD = 1.68, contrast $t(792) = -1.86$, $p = .58$, d = 0.27, 95% CI [-0.02, 0.56]) - the effect attenuation we predicted. When the violation was high in severity and committed in the recent past (murdering a man earlier today), slower responders (M = 3.51, SD = 1.75) were judged as less sincere than faster responders (M = 4.55, SD = 1.44, $t(792) = -4.29$, $p < .001$, d = 0.64, 95% CI [0.35, 0.93]); when the violation was high in severity and committed in the distant past, again slower responders (M = 3.65, SD = 1.75) were judged as less sincere than faster responders (M = 4.48, SD = 1.50, $t(792) = -3.47$, $p = .013$, d = 0.52, 95% CI [0.36, 0.91]). Descriptive statistics are depicted in Figure 3. The ANOVA also found found a significant main effect of response speed, ($F(1, 792) = 68.36$, $p < .001$, $\eta^2 = .078$), indicating that faster responses were considered more sincere than slower ones, but no significant main effects of temporal distance, ($F(1, 792) = 0.20$, $p = .89$,

$\eta^2 < .001$), and violation severity, ($F(1, 792) = 3.94$, $p = .083$, $\eta^2 = .003$). The two-way interaction between response speed and temporal distance was significant, ($F(1, 792) = 8.34$, $p = .004$, $\eta^2 = .010$), indicating that the effect of response speed on sincerity was smaller but still significant when events were far away in the past compared to closer events, but the other two-way interactions between temporal distance and violation severity, ($F(1, 792) = .02$, $p = .88$, $\eta^2 < .001$), and between violation severity and response speed, ($F(1, 792) = .16$, $p = .69$, $\eta^2 < .001$), were not statistically significant.

Figure 3. The effect of violation severity, temporal distance, and response speed on sincerity judgments, Study 5. Errors bars represent ± one standard error around the mean.

Memory effort. A 2 X 2 X 2 between-subjects ANOVA with response speed, violation severity, and temporal distance as factors found a significant two-way interaction between temporal distance of the event and violation severity ($F(1, 792) = 15.71$, $p < .001$, $\eta^2 = .018$). When the event being questioned was one in the distant past, participants perceived that the responder exerted higher effort if the event was a low-severity violation ($M = 3.95$,

SD = 1.88) as compared to a high-severity violation (*M* = 2.98, *SD* = 1.96, contrast *t*(792) = 4.65, *p* < .001, *d* = 0.50, 95% CI [0.30, 0.50]). No such effect was found when the event under question was one in the recent past (low severity *M* = 2.98, *SD* = 1.79; high severity *M* = 3.15, *SD* = 1.89, *t*(792) = -0.92, *p* = .80, *d* = 0.09, 95% CI [-0.13, 0.27]). Overall, this analysis indicates that participants expected the responder to be more likely to exert memory effort for an event that happened in the distant past and that was not a severe violation. Note that it is exactly in this case that we found a smaller and non-significant effect of response speed on sincerity judgments: when the event is considered as involving more memory effort, we observed a smaller effect of response speed. This finding corroborates our reasoning that the attribution of response speed to cognitive effort may reduce inferences of insincerity. The ANOVA also found a significant main effect of response speed, (*F*(1, 792) = 29.86, *p* < .001, η^2 = .035), indicating that people attributed higher memory effort to slower responses, significant main effects of temporal distance, (*F*(1, 792) = 13.96, *p* < .001, η^2 = .016), indicating that participants attributed higher memory effort to events in the distant past, and violation severity, (*F*(1, 792) = 7.23, *p* = .007, η^2 = .008), indicating that participants believed that recalling the memory of a trivial violation required greater memory effort compared to a recalling the memory of a severe violation. We found no significant effect of the two-way interactions between temporal distance and response speed, (*F*(1, 792) = .53, *p* = .53, η^2 < .001), and violation severity and response speed, (*F*(1, 792) = 1.00, *p* = .32, η^2 = .001). Finally, we found no three-way interaction between response speed, violation severity, and temporal distance, (*F*(1, 792) = 1.46, *p* = .23, η^2 = .002).

Ease of retrieval. A 2 X 2 X 2 between-subjects ANOVA with response speed, violation severity, and temporal distance as factors found no significant main effect of response speed, (*F*(1, 792< .001, *p* = .99, η^2 < .001), a significant main effects of temporal distance, (*F*(1, 792) = 101.70, *p* < .001, η^2 = .097), indicating that participants thoughts

events distant in the past were harder to retrieve, and violation severity, ($F(1, 792) = 83.30$, $p < .001$, $\eta^2 = .079$), indicating that participants thought the trivial violation was easier to retrieve compared to the severe violation. We found a significant two-way interaction between violation severity and temporal distance, ($F(1, 792) = 69.76$, $p < .001$, $\eta^2 = .066$), indicating that the effect of violation severity was larger for actions more distant in the past (low severity $M = 3.75$, $SD = 1.97$; high severity $M = 5.85$, $SD = 1.59$), contrast $t(792) = -12.22$, $p < .001$, $d = 1.18$, 95% CI [0.97, 1.39] compared to actions closer in the past (low severity $M = 5.90$, $SD = 1.46$; high severity $M = 6.03$, $SD = 1.44$), contrast $t(792) = -0.55$, $p = .95$, $d = 0.09$, 95% CI [-0.11, 0.29].If the memory is trivial and in the distant past, observers consider it harder to retrieve and are more likely to attribute a delay to a memory effort. The two remaining two-way interactions were not significant (response speed by temporal distance, ($F(1, 792) = 1.00$, $p = .32$, $\eta^2 = .001$), and response speed by violation severity, ($F(1, 792) = 0.16$, $p = .69$, $\eta^2 < .001$)). Finally, we found no three-way interaction between response speed, violation severity, and temporal distance, ($F(1, 792) = 2.95$, $p = .086$, $\eta^2 = .003$).

Thought suppression inferences. A 2 X 2 X 2 between-subjects ANOVA with response speed, violation severity, and temporal distance as factors found a significant main effect of response speed ($F(1, 792) = 86.84$, $p < .001$, $\eta^2 = .098$), indicating that people attributed slower responses to thought suppression to a greater extent than faster responses, but no other significant main effects of temporal distance ($F(1, 792) = .01$, $p = .93$, $\eta^2 < .001$), and violation severity ($F(1, 792) = .01$, $p = .94$, $\eta^2 < .001$). Critically, we found a statistically significant two-way interaction between response speed and temporal distance ($F(1, 792) = 8.34$, $p = .018$, $\eta^2 = .006$), indicating that the effect of response speed on thought suppression inferences was smaller when events were more distant in the past compared to recent events. The other two-way interactions between temporal distance and violation severity, ($F(1, 792) = .24$, $p = .63$, $\eta^2 < .001$), and between violation severity and response speed, ($F(1, 792) = .03$,

$p = .86$, $\eta^2 < .001$), were not statistically significant. We did not find a statistically significant three-way interaction between response speed, violation severity and temporal distance, ($F(1, 792) = 2.67$, $p = .10$, $\eta^2 = .003$).

Additional moderated mediation analyses (discussed in detail in the SOM) found significant indirect effects of both thought suppression inferences and memory effort linking the relationship between response speed and sincerity perceptions, both moderated by violation severity and temporal distance. These results replicate our previous results relating the mediating role of thought suppression inferences, and provide additional support for the contextual role of memory effort inferences if the context requires the actor to remember information that is hard to retrieve.

Discussion

The moderation effect established by the present study adds important nuance to our results. It shows that perceived mental effort, specifically memory effort, can attenuate the effects of response speed of sincerity judgments. When the event that people are asked about should be easily retrievable in memory (such as a mundane experience in the recent past, or a salient memory from the distant past), people readily infer sincerity from response speed. However, people are less likely to do so if they have reason to believe that the event is something that is difficult to remember, presumably because they are more likely to attribute the response delay to memory effort, rather than thought suppression or answer fabrication. This study shows that people attribute response speed to different cognitive processes in different contexts, and that such differential attribution affects sincerity judgments. This study is important because it further nuances our understanding of the circumstances in which response speed matters for sincerity perceptions. If observers believe that the answer requires a cognitive effort process that is not connected to insincerity, then the effect of response speed is attenuated.

Study 6 – Can People Voluntarily Ignore Response Speed When Making Sincerity Judgments?

Can people ignore response speed in the interpersonal judgment process if they are told to? Answering this question would reveal the extent to which the effect is controllable: if the effect of response speed is used in the judgement process in an automatic and uncontrollable way, instructions to ignore response speed should have no impact on the judgement outcome (Hütter & Sweldens, 2018). If, however, response speed can be taken into account in a controllable way, one should observe a reduction in the effect of response speed on sincerity judgements following instructions to ignore response speed. Whether or not response speed can be disregarded in the sincerity judgement process is imperative to examine because the answer likely has implications in high stakes contexts such as judicial settings. For instance, if it appears that response speed *can* be discounted in the sincerity judgement process, then jurors should be asked to do so when there are legitimate reasons for slower responses, such as a language barrier between the interrogator and the suspect. If our results show that response speed *cannot* be discounted in the sincerity judgement process, then it may be necessary for jury systems to consider concealing the element of response speed, where appropriate, when presenting various forms of evidence. For instance, video or audio recordings of interrogations may be replaced with written dialogues where response speed is not reflected. This may prevent people from misattributing response delays to thought suppression or answer fabrication, which may be connected to insincerity. This study was preregistered at http://aspredicted.org/blind.php?x=gn2a9p.

Method

Participants. We initially recruited 605 participants on Mechanical Turk (310 males, 295 females, M_{age} = 38.26, SD_{age} = 11.75). As in Study 1a and 1b, earphones or headphones were required for this task. We employed two attention checks to verify that participants were

paying attention to the video and to the presented audio. At the beginning of the task, participants were shown a video in which a hand with two fingers was shown and the word "cabbage" was spoken. In the next screen, participants were asked which word was spoken in the video (among "Tomato", "Potato", and "Cabbage"), and how many fingers were shown in the video ("Four", "Seven", "Two"). Five-hundred and sixty-seven participants correctly answered both attention checks (282 males, 285 females, M_{age} = 38.53, SD_{age} = 11.86) and were retained for analyses.

Procedure. Participants were randomly assigned to one of four conditions in a 2 (response speed: fast vs. slow) X 2 (instruction: ignore vs. no instruction) between-participants design. Participants were first shown two videos (in random order, of a man and a woman; also used in study S1), in which they received the description that this was a police interrogation and that the person in the video was accused of having stolen a few thousand dollars from their workplace. In the fast condition, after the actor playing the police officer had asked the question: "Did you steal the money?", the actor playing the suspect immediately replied "No, I didn't!", whereas in the slow condition, the suspect replied after a five second delay. Following this, participants were either not given any additional instructions (no instructions condition), or told: "IMPORTANT: In answering the questions, please do not take into account the speed with which the person replied."

Participants subsequently completed five questions: a manipulation check of response speed ("How was the response?", measured on a scale ranging from 1 (*Very slow*) to 7 (*Very fast*)), a measure of perceived sincerity ("What do you think about the statement?" "Sincere"; "Truthful", on 7-point scales from 1 (*Not at all*) to 7 (*Very much*), averaged in two sincerity measures, both Cronbach's αs > .90), a guilt judgment item ("Do you think this person is guilty?" , which was answered by choosing "Yes" or "No"), and a manipulation check of

instruction compliance ("Did you take response speed into account in replying to the above questions?") which was answered on a 7 point scale from 1 (*Not at all*) to 7 (*Very much*).

Results

Manipulation check, response speed. A 2 (instructions to ignore: presented vs. no instruction; between-subjects) X 2 (actor gender: man vs. woman, within-subjects) X 2 (response speed: fast vs. slow, between-subjects) mixed-model ANOVA revealed a significant, between-subjects effect of response speed, $F(1, 565) = 1638.72$, $p < .001$, $\eta^2 = .638$. On average, slower responders ($M = 1.91$, $SD = 1.00$) were considered slower than faster ones ($M = 5.17$, $SD = 0.91$), $t(565) = -40.48$, $p < .001$, $d = 3.40$, 95% CI [3.14, 3.66]. The ANOVA found a significant effect of actor gender, such that the man was on average perceived faster $F(1, 565) = 18.60$, $p < .001$, $\eta^2 = .004$, and a significant mixed interaction between response speed and actor gender, $F(1, 565) = 7.66$, $p = .006$, $\eta^2 = .002$, showing that the effect of response speed was stronger for the male actor.

Manipulation check, instructions to ignore. A 2 (instructions to ignore: presented vs. no instruction; between-subjects) X 2 (actor gender: man vs. woman, within-subjects) X 2 (response speed: fast vs. slow, between-subjects) mixed-model ANOVA revealed a significant between-subjects main effect of instructions to ignore, $F(1, 565) = 204.16$, $p < .001$, $\eta^2 = .237$. On average, participants who were *not* instructed to ignore response speed ($M = 5.18$, $SD = 1.51$) reported that they took response speed into account to a larger extent than participants who *were* instructed to ignore it ($M = 3.08$, $SD = 1.96$), $t(565) = 14.29$, $p < .001$, $d = 1.20$, 95% CI [1.02, 1.38]. The ANOVA revealed no significant within-subjects effect of scenario, $F(1, 565) = .08$, $p = .78$, $\eta^2 < .001$, and no significant mixed interaction between actor gender and instructions to ignore, $F(1, 565) = 2.54$, $p = .11$, $\eta^2 < .001$,

Sincerity judgments. A 2 (instructions to ignore: presented vs. no instruction; between-subjects) X 2 (actor gender: man vs. woman, within-subjects) X 2 (response speed:

fast vs. slow, between-subjects) mixed-model ANOVA revealed a significant between-subjects main effect of response speed, $F(1, 563) = 178.79$, $p < .001$, $\eta^2 = .082$, a significant between-subjects main effect of instructions to ignore, $F(1, 563) = 8.31$, $p = .004$, $\eta^2 = .004$, which were both qualified by the predicted, significant interaction between speed and instructions to ignore, $F(1, 563) = 10.74$, $p = .001$, $\eta^2 = .005$, indicating that the effect of response speed on sincerity was reduced by instructions to ignore it. When participants were not given instructions to ignore response speed, they considered slower responders ($M = 2.58$, $SD = 1.18$) to be less sincere than faster responders ($M = 4.20$, $SD = 1.12$, $t(563) = 11.74$, $p < .001$, $d = 1.40$, 95% CI [1.14, 1.66]). When participants were given instructions to ignore response speed, the difference between slower responders ($M = 3.18$, $SD = 1.21$) and faster responders ($M = 4.16$, $SD = 1.12$) was significantly smaller, $t(563) = 7.16$, $p < .001$, $d = 0.84$, 95% CI [0.60, 1.08]. Descriptive statistics are presented in Table 6. The ANOVA also found a significant within-subjects effect of actor gender, $F(1, 563) = .21$, $p = .021$, $\eta^2 = .001$, indicating that the woman was considered more sincere than the man in our scenarios; no significant mixed interaction between actor gender and speed, $F(1, 563) = 1.16$, $p = .28$, $\eta^2 < .001$, no significant interaction between actor gender and instructions to ignore, $F(1, 563) = .35$, $p = .56$, $\eta^2 < .001$, and a significant mixed three-way interaction between actor gender, response speed, and instructions to ignore, $F(1, 563) = 5.72$, $p = .037$, $\eta^2 = .001$, indicating a larger effect of the interaction of response speed and instructions to ignore in the woman scenario compared to the man scenario.

Guilt judgment. A repeated-measures logistic regression with actor gender as the within-subjects factor and response speed and instructions to ignore as between-subjects factors found a statistically significant interaction between response speed and instructions to ignore, χ^2 (1) = 9.37, $p = .002$, as predicted. When participants were not instructed to ignore response speed, they considered the slower responders (215/288 total choices, or 75% of

choices) as more likely to be guilty than the faster one (85/278 total choices, or 31%). When they were instructed to ignore response speed, the difference in guilt judgments between slower responders (170/284, or 60% of responses) and faster ones (100/246, or 41% of responses) was smaller. These results are represented in Figure 4 and Table 6. The logistic regression found no significant main effect of actor gender, χ^2 (1) = .49, p = .48; a significant effect of response speed, χ^2 (1) = 125.36, p < .001, indicating that, in general, faster responders were less likely to be considered guilty; a significant main effect of instructions to ignore, χ^2 (1) = 4.13, p = .042, indicating that, on average, actors were less likely to be considered guilty when participants were instructed to ignore response speed; no significant interaction between scenario and response speed, χ^2 (1) = .66, p = .42; no significant interaction between actor gender and instructions to ignore, χ^2 (1) = .19, p = .66; and no significant three-way interaction between actor gender, speed, and instructions to ignore, χ^2 (1) = 1.50, p = .22.

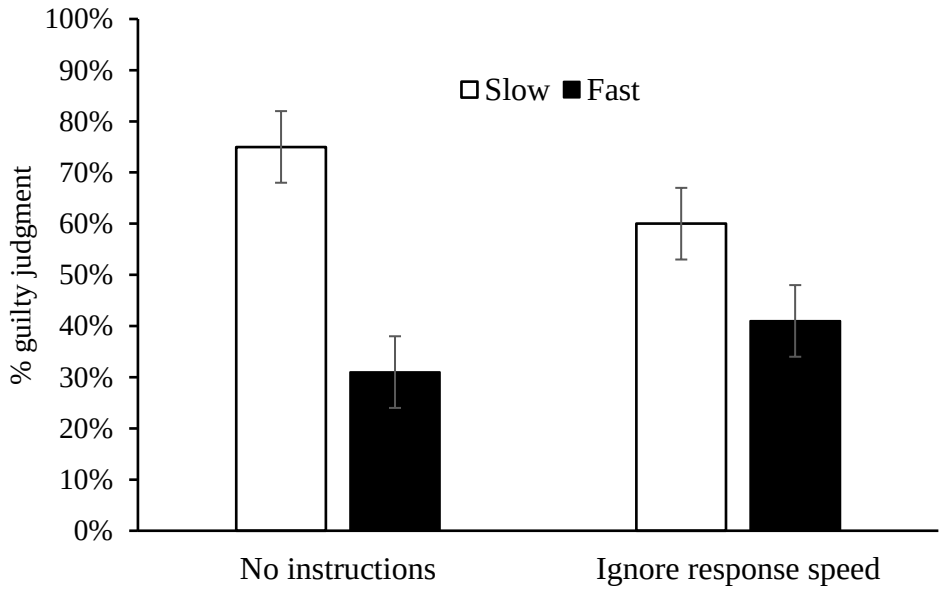

Figure 4. The effect of response speed and instructions to ignore response speed on guilt judgments, Study 6. Error bars indicate ± one standard error around the proportion.

Table 6

The effect of response speed and instructions to ignore response speed on sincerity judgments and guilt judgment, Study 6

Actor	Response speed	Instructions to ignore response speed	Sincerity judgments M (SD)	Guilt judgment frequency (%)
Female actor	Slow	No instructions	2.57 (1.33)	107/144 (74%)
		Ignore response speed	3.27 (1.46)	83/142 (59%)
	Fast	No instructions	4.41 (1.57)	39/138 (28%)
		Ignore response speed	4.19 (1.42)	49/143 (34%)
Male actor	Slow	No instructions	2.59 (1.30)	108/144 (75%)
		Ignore response speed	3.09 (1.49)	87/142 (61%)
	Fast	No instructions	3.99 (1.28)	46/138 (33%)
		Ignore response speed	4.14 (1.45)	51/143 (36%)

Discussion

Study 6 shows that the effect of response speed on perceived sincerity and guilt judgment can be reduced by explicit instructions to ignore response speed, although we did not manage to eliminate it completely. This partiality of the effect reduction may be due to a proportion of participants who still used response speed as a cue to sincerity even when instructed not to, as the relevant manipulation check showed a lower value in the "ignore" (M = 3.08) than in the "no instructions" condition (M = 5.18), but still higher than the scale floor (1 in this case). However, instead of viewing the results of Study 5 as the outcome of a manipulation failure, they might be better thought of as a reflection of reality – perhaps

people believe that response delays are so integral to judgements of sincerity that they continue to voluntarily rely on it despite explicit instructions not to. Regardless, these results suggest that people are aware that they are taking response speed into account when making sincerity judgments, and that the effect of response speed on sincerity judgments and guilty votes is controllable to a certain extent.

General Discussion

Using diverse stimuli (audio, video, and vignette scenarios), participants (American, French, and British), study designs (both within- and between-subjects), and situations (from mundane opinions to confessing a crime), the present study shows that slower responders are perceived as less sincere. In Studies 1a, 1b, and 1c, using audio, video, and vignette scenario stimuli respectively, we showed that observers judge slower responders as less sincere. In Studies 2a, 2b, and 2c, we demonstrated that the effect of response speed on perceived sincerity is driven by thought suppression inferences such that observers rate slower responders as less sincere because they attribute the response delay to the responder suppressing another thought. Studies 3a and 3b show that an alternative mediator, perceived answer fabrication, is also part of the explanation of this phenomenon. In Study 4 we found that the perceived sincerity of socially undesirable responses are less likely to be impacted by response speed. Study 5 showed that the type of cognitive process inferred by response speed can influence the magnitude of the effect: if a response delay can be attributed to memory effort, the effect of response speed on sincerity judgments is reduced. Finally, in Study 6, we showed that people are able to disregard response speed information to some extent in the sincerity judgment process when explicitly instructed to do so. In the SOM, Study S1 replicates the basic effect in a different population (French students). Studies S2 and S3 replicated and extended Study 4 to different scenarios.

Theoretical Implications

Findings of the present study compliment and extend the existing literature in several ways. Numerous studies have documented people's reliance on observing other people's response speed in various impression formation and judgement processes, ranging from morality attribution (Critcher et al., 2013) to expectations of cooperation (Evans & van de Calseyde, 2017). However, given that perceived sincerity is an element that is crucial for trust and cooperation (Caza, Zhang, Wang, & Bai, 2015; Lewicki & Bunker, 1996), it is discomforting to see that extant research could not give a clear answer to the question of whether response speed has a causal effect on perceptions of sincerity. The present study addresses this gap in the literature by showing that sincerity is also inferred from response speed. Demonstrating that response speed, alone, is causally responsible for changes in sincerity perceptions also enhances our understanding of the relationship between these two variables because previous research have been unable to provide direct evidence of causality. Specifically, previous studies involving response speed and perceived sincerity have only tangentially examined the relationship between the two, such as by correlating response speed and perceived sincerity as dependent variables after having manipulated deception intention (Buller et al., 1991; Cornetto, 2002; Harrison et al., 1978; Stiff & Miller, 1986).

In addition to demonstrating causality, we consistently show that slower responses are perceived as less sincere. This helps set the record straight on the directionality of the relationship between response speed and perceived sincerity, which previous research has provided contradictory findings on. For instance, some studies showed a curvilinear relationship (Baskett & Freedle, 1974; Boltz, 2005), some showed no statistically significant relationship (Vrij et al., 2001), some suggesting that slower responses are perceived as more sincere (Kraut & Lewis, 1982), and some suggesting that slower responses are perceived as less sincere (Harrison et al., 1978). Reliably establishing effect directionality is crucial for the

advancement of research on this phenomenon because confidence in the superordinate phenomenon is the cornerstone of further inquisition, such as on the mechanism underlying the phenomenon and its boundary conditions. The robustness and high level of replicability observed in the present research also allows us to speculate that previous inconsistencies were indeed the result of methodological inconsistencies and limitations such as varying study designs and under-powered samples respectively.

Our research also carries implications for the study of conversations. Research in linguistics suggests that people tend to delay "dispreferred" responses, that is, responses that risk offending the counterpart, for instance by changing the order of the words if they are Japanese speakers, or by hesitating, delaying the response, and inserting paraverbal cues if they speak English (Pomerantz, 1984; Tanaka, 2008). It has also been evidenced that recipients anticipate that delayed responses will be dispreferred (Lerner, 1991, 1996). The present work complements such previous research by showing that there are additional consequences to a response delay, namely, perceived insincerity. Additionally, the present findings also complement the literature connecting response speed and *actual* deception, because it suggests that slower responses are not only more likely to *be* insincere (Seymour & Kerlin, 2008; Seymour et al., 2000; Suchotzki et al., 2017), but are also more likely to be *perceived* as insincere.

Interestingly, findings of the present study suggest that people have a rather sophisticated network of intuitions about sincerity and response speed. For instance, perceived sincerity seems to be commensurately inferred from the *magnitude* of response delay, up to a certain point: a response given after two seconds is generally considered less sincere than a response given immediately, and more sincere than a response given after a five seconds delay. This is not the only cue supporting the notion that people hold a vast web of lay intuitions regarding response speed and sincerity judgments. We also found that sincerity

judgments may be more, or less, response speed-based depending on the cognitive process to which response delays are attributed. Specifically, delay-induced perceptions of insincerity are the result of the delay being attributed to thought suppression or answer fabrication. Consequently, when the delay can be attributed to other cognitive processes not directly connected with insincerity, such as mental effort, response delays are not judged as insincere to the same extent. Taken together, the present research extends the existing literature by elucidating two novel processes underlying the effect of response speed and perceived sincerity, as well as establishing the nuances associated with people's intuitions regarding response speed and sincerity.

Further nuance was added to our theoretical model when the effect of response speed on perceived sincerity was shown to be smaller in magnitude when responses are socially undesirable. Consistent with the notion that socially undesirable acts are considered a signal of sincerity (Bonnefon & Villejoubert, 2006; Feldman, Lian, Kosinski, & Stillwell, 2017), the present study connects two streams of research which have – until now - proceeded in parallel: one investigating the interpersonal consequences of response speed (Evans & van de Calseyde, 2017; Van de Calseyde et al., 2014) and one investigating people's impressions of socially dispreferred actions and words (Brown, Levinson, & Levinson, 1987; Lee & Pinker, 2010). This also reinforces the notion that the attribution of cognitive process to response speed is situation-dependent, and that several contextual factors are at play in determining what inferences are made based on response speed.

In addition, previous research have largely investigated the connections between response speed and observers' inferences of response speed one at a time. For instance, observed response speed in judgments of decision and recommendation quality has been attributed to inferences of thoughtfulness in one study (Kupor, Tormala, Norton, & Rucker, 2014), and to inferences of cognitive effort in another study (Efendic et al., 2020). In both

studies, the connection between response speed and the inferred cognitive process (thoughtfulness and cognitive effort) has been identified, but conditions under which observers are more likely to attribute response speed to a different cognitive process have not been acknowledged. This is potentially problematic because it may give off the impression that observers typically attribute response speed to only a single cognitive process. Our research sets the record straight by showing that people are capable of attributing response speed to different cognitive processes (thought suppression, answer fabrication, and memory effort) when making a judgment. We also provide some conditions under which alternative attributions are made (e.g., response delay is more likely to be attributed to mental effort when the question is related to an event in the distant past).

Finally, we show that when instructed explicitly, people are able to voluntarily discount response speed in the sincerity inference equation. While this discounting was only partial in magnitude, it nevertheless suggests that the effect of response speed on sincerity judgements does not operate completely automatically and surreptitiously (Hütter & Sweldens, 2018), and that presumably people use response speed as a cue to infer sincerity willingly (Dietvorst & Simonsohn, 2018). Therefore, similar to people's voluntary use of to-be-ignored information (Dietvorst & Simonsohn, 2018), the effect of response speed on sincerity judgments can be considered controllable, at least to an extent. This finding is important because it connects our findings with the larger literature on inference controllability (for reviews, see Gawronski & Bodenhausen, 2006; Houwer, Thomas, & Baeyens, 2001), crucial to the understanding of the automaticity of the effect and of the effectiveness of potential strategies to reduce it.

Practical Implications

Being able to detect sincerity in others is paramount for human collaboration and trust (Boyd, Gintis, Bowles, & Richerson, 2003; Milinski & Semmann, 2002; Trivers, 1971). As such, people are constantly inferring sincerity in others, be it for high stakes events such as business deals and police interrogations, or trivial ones such as sensing whether their friend really does like their cake. Given that response speed is an ever-present feature of social interactions, our findings seem to have worrying implications for the judicial setting. This is because much like how people often cannot be persuaded to ignore invalid evidence in mock jury tasks (Dietvorst & Simonsohn, 2018; Kassin & Sommers, 1997), response speed appears to be a social cue that people are not entirely willing to ignore, even when explicitly instructed to." It is also possible that response speed is a social cue that people involuntarily rely on to a certain extent, akin to a mental heuristic. Consequently, in high stakes situations, such as judging whether someone is guilty of a crime, it is imperative that observers exercise more caution when using the cue of response speed in the judgement process. It would be unfair for the responder, such as a crime suspect, if the response delay was misattributed to thought suppression or answer fabrication when it was in fact caused by a different factor, such as simply being distracted. The present findings provide a partial solution: instructing people to ignore response speed in the sincerity judgement process. Again, our participants, despite being explicitly instructed to ignore response speed, still relied on it to a certain extent in order to judge sincerity, testifying to the strength of response speed as a cue that people rely on in sincerity judgments. Given this, it may be appropriate in certain high stakes situations to replace response speed information (e.g., video or audio evidence) completely. For instance, judges may opt to be presented with alternative forms of evidence that do not reflect response speed, such as transcribed written versions of audio recordings. This method may allow

people to make sincerity judgments without taking response speed into consideration at all, something we were not able to accomplish in Study 5.

Limitations and Future Research

While the utilization of well powered sample sizes and a variety of hypothetical scenarios within the previous study augments the robustness of the predicted phenomenon, some limitations must be acknowledged. First, our investigation and findings are confined to relatively simple questions which required simple responses. This is because previous research on expectancies of response times indicates that people expect more complicated responses to be accompanied by a commensurate response delay (Evans & van de Calseyde, 2017; Kupor et al., 2014), understandably because such responses require more thought on the part of the responder. In fact, Study 5 supported this notion by testing the boundary parameter of perceived mental effort required by the response. We found that when a response is considered to require mental effort, people are indeed more likely to attribute a response delay to mental effort rather than thought suppression or answer fabrication, and the effect of response speed on sincerity judgments consequently diminishes. It is important to note that we did not include experiments that utilize relatively complex questions such as “What is something of which you are particularly proud?”. The reason for this is that such complex questions may evoke more than just mental effort, for instance, it may induce more intense emotions or memories that are so satisfying that the responder becomes immersed(Wang, Hagger, & Chatzisarantis, 2018), thereby taking more time to respond. As such, the inherent subjectivity and mechanistic complexities of responding to such questions may introduce multiple possibilities in terms of delay attribution, which may inevitably make any results difficult to interpret. This is precisely why in Study 5, we utilized stimulus materials that allow us to investigate the moderation effect of mental effort attribution without the unwanted complexities that may accompany complex questions - so that that the focus of the present

work is not blurred, and scope not breached. In sum, the notion that response delays promote perceptions of insincerity necessarily entails a level of nuance and should not be taken as a sweeping statement.

Nevertheless, an interesting question that future studies are encouraged to examine is whether the effect of response speed on sincerity judgements can still be observed for less straightforward questions when a response delay is introduced *in addition* to the expected magnitude of delay. For instance, if people already expect the responder to respond after a four second delay to account for the complexity of the question and the thoughtfulness required in the answer, would the response still be perceived as less sincere if provided after a nine second delay (an additional five second delay)? This would help establish whether the predicted phenomenon has a more overarching effect across different question types, or whether our findings are confined to straightforward questions and responses.

An additional question that awaits future investigation is whether our findings can be generalized across cultures. Despite our best efforts to investigate different demographics, we managed to collect data in three countries – U.S., U.K., and France. While this provides a measure of solace regarding the generalizability of the effect of response speed on sincerity judgments, all samples included in the present study came from WEIRD populations (Western, Educated, Industralized, Rich, Democratic; Henrich, Heine, & Norenzayan, 2010). It is possible that some cultures or individuals may prize the quality of being planned and deliberated more than others. As such, response delays may not always be taken as a reflection of thought suppression or answer fabrication, but qualities with a positive connotation instead, such as cautiousness. Future studies are therefore encouraged to examine the cross-culture generalisability of the effect of response speed on sincerity judgements.

In a similar vein, future studies are encouraged to explore potential individual differences in the manifestation of the predicted phenomenon. Research suggest that

individuals differ in their tendency to use episodic cues to judge others (Scopelliti, Min, McCormick, Kassam, & Morewedge, 2017). As such, some people may be more predisposed to rely on response speed as a heuristic in making sincerity judgements without further thought, while others may naturally be more careful in casting sincerity judgments. Future research may therefore investigate whether some people are more likely than others to consider slower responses as insincere, and whether such individual difference are associated with certain personality traits.

Future research may also wish to take a more solution focused approach. For instance, we have shown that people are less likely to infer insincerity from response delays when they are instructed to ignore response speed, and also when they attribute response speed to a factor other than thought suppression or answer fabrication. Given this, it is possible that combining instructions to ignore response speed with a believable excuse (e.g., "IMPORTANT: please ignore the responder's response speed, because she has a hearing impediment") may be a more potent way to prevent people from inferring insincerity from response delays.

Finally, throughout our experiments, we observed a small, but recurrent trend for female actors to be considered more sincere, on average. While the lack of a systematic comparison between the genders precludes us from drawing strong conclusions about this effect, research has shown, for example, that women are given shorter sentences than men for similar felonies (Doerner & Demuth, 2014). May it be because people tend to believe women more in the courtroom? Future research may investigate in a more systematic way whether women are really considered more sincere than men, and if so, whether this discrepancy engenders downstream social effects such as women being more leniently judged, or being relied on more in workplace settings.

Conclusion

Response speed is an inherent, ubiquitous, and noticeable cue in social interactions. A burgeoning line of research (Evans & Rand, 2019; Kupor et al., 2014; Van de Calseyde et al., 2014) shows that observers use response speed to draw various inferences about the response and the responder. The present study shows that one such inference is sincerity – people have a tendency to believe that response delays are the result of the responder suppressing another thought, and are therefore a reflection of insincerity. Interestingly, we also show that people do not simply rely on response speed as a proxy to sincerity in a dogmatic and one-dimensional way, rather, people seem to have a sophisticated understanding of what response speed represents and what it does not represent in different contexts. Nevertheless, our research shows that, on the whole, a fast response seems to be perceived as more sincere, while a response that is delayed for even a couple of seconds may be considered a slow lie.

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Slow Lies: Response Delays Promote Perceptions of Insincerity

Supplementary Online Materials (SOM)

Reminder: data, analyses, and materials for all studies are available at https://osf.io/pqmz2/?view_only=6014182f393e4ffe89c9db435ec85ca0.

Table of Contents

Preregistrations

Study	Preregistration link	Result
Study 1a	http://aspredicted.org/blind.php?x=4ry7ub	Slower responders are perceived as less sincere (audio stimuli)
Study 1b	http://aspredicted.org/blind.php?x=p5zj5p	Slower responders are perceived as less sincere and judged to be guilty more often (video stimuli)
Study 1c	http://aspredicted.org/blind.php?x=5aw8dj	Slower responders are perceived as less sincere (vignette scenario stimuli).
Study 2a	http://aspredicted.org/blind.php?x=a93tx5.	Thought suppressions inferences mediate the effect of response speed on perceived sincerity, between-subjects.
Study 2b	Not preregistered	Thought suppressions inferences mediate the effect of response speed on perceived sincerity, within-subjects.
Study 2c	http://aspredicted.org/blind.php?x=zd9ky2	Causal chain study: thought suppression inferences independently decreases perceived sincerity
Study 3a	https://aspredicted.org/blind.php?x=ic96x3	Answer fabrication judgments mediate the effect of response speed on perceived sincerity
Study 3b	https://aspredicted.org/blind.php?x=fg435a	Causal chain study: answer fabrication judgments independently decrease perceived sincerity judgments
Study 4	Not preregistered	The effect of response speed on sincerity judgments is weaker when the response is socially undesirable
Study 5	http://aspredicted.org/blind.php?x=dx2n3q	The effect of response speed on sincerity judgements is weaker if response delay can be attributed to memory effort
Study 6	http://aspredicted.org/blind.php?x=gn2a9p	Instruction to ignore response speed reduces the effect (video stimuli)
Study S1	http://aspredicted.org/blind.php?x=72vw9c	Conceptual replication of study 1c and study 2, with different scenarios, response speeds, and with French students as participants
Study S2	Not preregistered	Conceptual replication of study 3, with stranger as the responder, rather than friend
Study S3	Not preregistered	Conceptual replication of study 3, with extension to guilt judgment: admission of guilt moderates the effect

Preregistered and actual sample sizes

We collected more participants than we preregistered (275 rather than 200) in study S1 (lab), because more participants than expected signed up for the sessions in which the study was run. For all studies, we only ran analyses after we obtained all the data. In other cases, there are minor discrepancies (within 15 participants) between the preregistered and the actual sample size, due to the sometimes faulty connection between Qualtrics and Mechanical Turk (and Prolific).

Participant compensation

Participants in study S1 were French university students, compensated with course credit. Participants in study 2a and 2c were online crowdsourced members of the public in the U.K., recruited through the Prolific platform compensated with £0.70 and £0.40 respectively. Participants in all other studies in both the main paper and the SOM were online crowdsourced members of the U.S. public, recruited through Amazon's Mechanical Turk platform, compensated with $0.50.

Supplementary Studies

Study S1 – Replication across Situations and in a French Sample

The objective of this study is to replicate the effect of response delay on perceived sincerity found in Studies 1a-1c in a different sample (French students), and to test whether this effect is mediated by thought suppression inferences using a between-subjects study design rather than the within-subjects study design employed in Study 2. We also tested whether participants would be less likely to donate money to slower responders (rather than faster responders) to test whether their judgements of sincerity translates to behavioural outcomes. This study was preregistered at http://aspredicted.org/blind.php?x=72vw9c

Method

Participants and procedure. We recruited 275 students at a French business school (109 males, 166 females; M_{age} = 21.59, SD_{age} = 1.70). Participants were randomly assigned to one of two conditions (fast and slow). In each condition, they read three scenarios where people suspected of a felony responded to an accusation, in the fast condition after a delay between 0 and 2 seconds, and in the slow condition after a delay between 15 to 18 seconds. Both the actors' names and the felony they allegedly committed changed across conditions, in order to increase generality. Participants read the following scenarios, in randomized order (in brackets, the slow condition):

Ian is suspected of having killed another man.

When asked about it, he waits 1 second [15 seconds] and says:

"No, I didn't do it!"

Meg is suspected of having stolen jewellery for a value of €3,000.

When asked about it, she waits 2 seconds [14 seconds] and says:

"No, I didn't do it!"

Hannah is suspected of having caused a car accident in which another person broke a leg.

When asked about it, she immediately [waits 18 seconds and] says:

"No, I didn't do it!"

Participants then completed ratings of the statement: perceived sincerity ("Sincere" and "Truthful"); and of thought suppression inferences ("Had time to look for an alternative answer"; "Was looking for another excuse"), all anchored at 1 (*not at all*) and 7 (*very much*). Further, they were asked how much out of a total imagined donation out of a total of €1 (two decimals) they would donate to the person in question, on a slider going from 0 to $1.00, with two decimals shown, and whether they thought the person in question was guilty ("Is this person guilty?" Yes/No response).

Results

Manipulation check. A repeated-measures ANOVA with response speed as between-subjects factors, and scenario as within-subjects factor showed a significant between-subjects main effect of response speed, $F(1, 273) = 279.70$, $p < .001$, $\eta^2 = .322$: on average, participants rated faster responses ($M = 4.63$, $SD = 1.10$) as faster than slower ones ($M = 2.17$, $SD = 1.33$), $d = 2.02$, 95% CI [1.73, 2.31]. Further, we found a significant but unexpected within-subjects main effect of scenario, $F(2, 546) = 118.39$, $p < .001$, $\eta^2 = .083$, indicating that actors in some scenarios were perceived as faster overall; and a significant mixed interaction, $F(2, 546) = 127.11$, $p < .001$, $\eta^2 = .089$ indicating that the effect size varied across

scenarios, albeit remaining statistically significant and in the same direction [4]. Overall, we found significant and sizeable effects of response speed on perceived response speed in all three scenarios. Results and effect sizes per scenario are summarized in Table S1.

Table S1

The effect of response speed on perceived response speed, Study S1

Scenario	M_{slow} (SD)	M_{fast} (SD)	t-value	df	*p*-value	Cohen's *d* [95% CI]
Ian	2.23 (1.60)	4.40 (1.64)	-11.12	273	< .001	-1.34 [-1.60, -1.08]
Meg	2.17 (1.41)	3.20 (1.75)	-5.39	273	< .001	-0.65 [-0.89, -0.41]
Hannah	2.12 (1.51)	6.29 (1.32)	-24.31	273	< .001	-2.93 [-3.27, -2.59]

Sincerity judgments. A repeated-measures ANOVA with response speed as between-subjects factors, and scenario as within-subjects factor showed a significant between-subjects main effect of response speed, $F(1, 273) = 49.30$, $p < .001$, $\eta^2 = .086$. On average, slower responses ($M = 2.58$, $SD = 1.13$) were considered less sincere than faster responses ($M = 3.50$, $SD = 1.03$), $d = 0.85$, 95% CI [0.60, 1.10]. Further, we found a significant, but unexpected within-subjects main effect of scenario, $F(2, 546) = 15.43$, $p < .001$, $\eta^2 = 0.023$, indicating that some actors were perceived as more sincere overall, and a significant mixed interaction, $F(2, 546) = 8.08$, $p < .001$, $\eta^2 = .012$, indicating that the effect of response speed on sincerity judgments varied across scenarios[1]. Across all scenarios, slower responses were always significantly perceived as less sincere. Results and effect sizes per scenario are summarized in Table S2.

[4] We did not have any a-priori predictions for these effects of scenario and its interaction with response speed on perceived response speed, sincerity judgments, thought suppression inferences, donation amount, and guilt judgment, which were likely due to slight variations in the scenarios used (e.g., character name, actor gender, violation). We report them here for completeness.

Table S2

The effect of response speed on sincerity judgments, Study S1

Scenario	M_{slow} (SD)	M_{fast} (SD)	t-value	df	*p*-value	Cohen's *d* [95% CI]
Ian	2.59 (1.42)	3.52 (1.45)	-5.33	273	< .001	-0.64 [-0.88, -0.40]
Meg	2.50 (1.29)	2.99 (1.45)	-2.98	273	0.003	-0.30 [-0.54, -0.06]
Hannah	2.66 (1.47)	3.98 (1.67)	-6.97	273	< .001	-0.84 [-1.09, -0.59]

Thought suppression inferences. A repeated-measures ANOVA with response speed as between-subjects factors, and scenario as within-subjects factor showed a significant between-subjects main effect of response speed, $F(2, 546) = 57.33$, $p < .001$, $\eta^2 = .099$. Participants thought slower responders (M = 4.69, SD = 1.38) were significantly more likely to be suppressing thoughts than faster responders (M = 3.53, SD = 1.14), $d = 0.91$, 95% CI [0.66, 1.16]. Further, we found a significant but unexpected within-subjects main effect of scenario, $F(2, 546) = 46.07$, $p < .001$, $\eta^2 = 0.056$, indicating that some actors were more likely to be seen as suppressing thoughts than others; and a significant mixed interaction, $F(1, 273) = 36.50$, $p < .001$, $\eta^2 = .044$, indicating that the effect of response speed was stronger for some actors than for others[1]. Results and effect sizes per scenario are summarized in Table S3.

Table S3

The effect of response speed on thought suppression inferences, Study S1

Scenario	M_{slow} (SD)	M_{fast} (SD)	t-value	df	*p*-value	Cohen's *d* [95% CI]
Ian	4.53 (1.85)	3.65 (1.55)	4.27	273	< .001	0.52 [0.28, 0.76]
Meg	4.85 (1.62)	4.46 (1.67)	1.94	273	0.053	0.23 [-0.01. 0.47]
Hannah	4.70 (1.67)	2.49 (1.54)	11.41	273	< .001	1.38 [1.12, 1.64]

Donation. A repeated-measures ANOVA with response speed as between-subjects factors, and scenario as within-subjects factor showed no significant between-subjects main effect of response speed, $F(1, 273) = 0.11$, $p = .735$, $\eta^2 < .001$. Participants donated similar amounts to slower responders ($M = 0.24$, $SD = 0.27$) and to faster responders ($M = 0.25$, $SD = 0.25$), $d = -0.04$, 95% CI [-0.28, 0.20]. Further, we found a significant but unexpected within-subjects main effect of scenario, $F(2, 546) = 10.84$, $p < .001$, $\eta^2 = 0.011$; and a significant but unexpected mixed interaction between response speed and scenario, $F(2, 546) = 3.93$, $p = .02$, $\eta^2 = .004$[1].

Guilt judgments. A repeated-measures logistic regression with response speed as between-subjects factor, and scenario as within-subjects factor showed a significant between-subjects effect of response speed, Wald $\chi^2 (1) = 36.49$, $p < .001$. Overall, in the slow condition, participants judged the actor guilty in 291 of 417 total choices (70%), while in the fast condition, they judged the actor guilty in 199 of 408 of total choices (49%). We also found a significant within-subjects effect of scenario, Wald $\chi^2 (1) = 13.35$, $p = .001$, indicating that some actors were more likely to be judged guilty than others, and a significant mixed interaction of response speed and scenario, Wald $\chi^2 (2) = 8.47$, $p = .014$, indicating that the effect of response speed on guilt judgments varied across scenarios[1]. This analysis shows that response speed had a significant effect on guilt judgments, such that slower responders were more likely to be judged as guilty. The effect of response speed on guilt judgment was always in the same direction: slower responders were more likely to be considered guilty than faster responders. Depending on the scenario, a slower response lead to an increase from 13% to 85% in the likelihood of guilt judgment. Results per scenario are presented in Table S4.

Table S4

The effect of response speed on guilt judgment, Study S1.

Scenario	Fast; Proportion guilty/total (%)	Slow; Proportion guilty/total (%)	Increase (%)	χ^2	p-value	Cramer's φ
Ian	57/136 (42%)	88/139 (63%)	50%	12.63	< .001	0.21
Meg	87/136 (64%)	100/139 (72%)	13%	2.01	.157	0.09
Hannah	55/136 (40%)	103/139 (74%)	85%	31.86	< .001	0.34

Note. The column increase (%) shows increase in percentage rather than in percent points

Mediation analysis. A mediation analysis (PROCESS for SPSS v 3.4 model 4, 5000 bootstraps, Hayes 2013) using response speed as the independent variable, the average of the three thought suppression inferences measures as the mediator, and the average of the three sincerity judgments as the dependent variable found a significant indirect effect, ab (SE) = 0.26 (0.05), 95% CI [0.17, 0.37]. This analysis replicates the mediation analysis conducted in Study 2a in a between-subjects study design rather than a within-subjects study, and provides further support for the mediating role of thought suppression inferences in generating sincerity judgments based on response speed.

Discussion

Study S1 replicated previous results: slower responses are seen as less sincere and slower responders are more likely to be judged as guilty of what they were accused of. This study also replicates the previous mediating mechanism, as the effect of response speed on sincerity and guilt judgment seems to be driven by heightened thought suppression inferences when response speed is slow, compared to when it is fast. These effects also seem relatively robust to the change of stimuli (vignette scenario rather than video). We did not find that participants were less likely to donate money to slower responders. This may be the result the failure of the donation question to represent a realistic monetary dependent variable in this scenario (Why would one donate anything to someone suspected of a crime?).

Study S2 - The Moderating Effect of Response Social Desirability: Strangers and Cakes

Study S2 is a close replication of study 4. We only changed the counterpart - participants were not asked to think of their best friend, but of a stranger, in order to add to the generalizability of the effect.

Method

Participants and procedure. We recruited 604 participants from MTurk (participant gender was not registered because of a survey error; M_{age} = 36.44, SD_{age} = 13.96). We manipulated two between-subjects factors: response speed (fast vs. slow) and response social desirability (desirable vs. undesirable) so that participants were randomly assigned to one of four conditions. Then, they were asked to read one of the variations of the following scenario (the dialogue for the slow condition and the socially undesirable response condition are listed in brackets).

> Imagine you have made a cake for a party. You are unsure if people will like it.
> Jake, a person you have just met at the party, is tasting it and you ask him for his opinion.
> He immediately (waits about 15 seconds and then) replies: "It's really good (really bad)!"

Participants had to further rate whether Jake was sincere ("Do you think Jake was sincere in this occasion?"), and whether he meant what he said ("Do you think Jake meant what he said in this occasion?") We averaged these two since their reliability was high, Cronbach's α = .88. Participants were also asked whether his answer was socially desirable and socially acceptable ("Was Jake's answer socially desirable?" "Was Jake's answer socially acceptable?" – these items were averaged since their reliability was high, Cronbach's α = .88), all anchored at 1 (*Not at all*) and 7 (*Very Much*). Finally, participants completed manipulation

checks, for response speed ("How fast was your friend in replying?" 1 (*Very slow*); 7 (*Very fast*), and for response valence ("Was the answer positive or negative?" 1 (*Very negative*); 7 (*Very positive*).

Results

Social desirability. Socially desirable responses were perceived as more socially desirable (M = 5.82, SD = 1.18) than socially undesirable responses (M = 3.32, SD = 1.54), $t(602) = -22.38$, $p < .001$, d = 1.82, 95% CI [1.63, 2.01].

Manipulation check, valence. Socially undesirable responses were perceived more negatively (M = 2.33, SD = 1.77) compared to socially desirable responses (M = 5.97, SD = 1.34), $t(602) = -28.49$, $p < .001$, d = 2.32, 95% CI [2.11, 2.53].

Manipulation check, response speed. Faster responses were perceived as faster (M = 6.15, SD = 1.14), than slower responses (M = 3.52, SD = 1.89), $t(602) = -20.70$, $p < .001$, d = 1.69, 95% CI [1.50, 1.88].

Sincerity judgments. A two-way ANOVA with response speed and social desirability as between-subjects factors found a significant effect of response speed, $F(1,600) = 20.60$, $p < .001$, $\eta^2 = 0.032$; a significant effect of social desirability, $F(1,600) = 8.48$, $p = .004$, $\eta^2 = 0.013$; and a significant response speed by response social desirability interaction, $F(1,600) = 19.43$, $p < .001$, $\eta^2 = 0.030$. When responses were socially undesirable, slow responses (M = 5.32, SD = 1.44) were not significantly more or less sincere compared to fast responses (M = 5.33, SD = 1.49), $t(301) = -.10$, $p = .93$, d = 0.01, 95% CI [-0.22, 0.24]. When responses were socially desirable, slower responses (M = 4.46, SD = 1.62) were considered less sincere than and fast responses (M = 5.51, SD = 1.18), $t(299) = -6.43$, $p < .001$, d = 0.74, 95% CI [0.51, 0.97]. This analysis shows that sincerity judgments are highly influenced by response speed,

but only when the response is socially desirable. Results are graphically summarized in Figure S1.

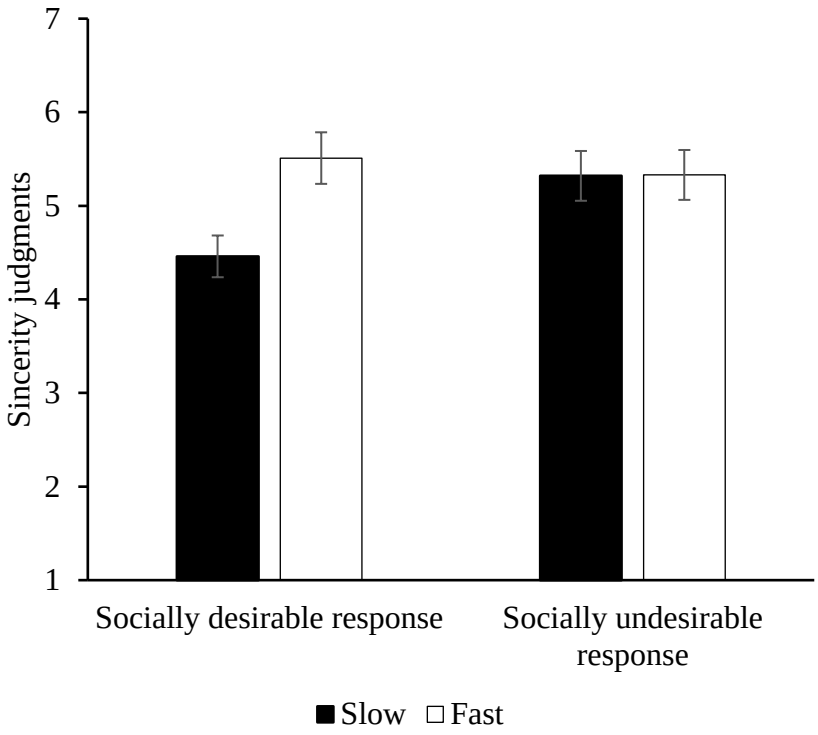

Figure S1. The effect of response speed and response social desirability on sincerity judgments, Study S2. Error bars represent the standard error around the mean.

Discussion

This study replicates the results of study 3 with an unknown counterpart rather than a friend. When the response was socially desirable, observers interpret a delayed response as less sincere. However, when the response was socially undesirable, response speed did not significantly influence sincerity judgments. This suggests that the interaction between response social desirability and response speed found in study 3 does not depend on the relationship between the observer and the counterpart.

Study S3 - If a Violation is Denied Too Late, It's as if it was confessed

This study aims to conceptually replicate and extend the results of Study 4 by testing different vignette scenarios and an additional dependent variable. In order to test whether the effect of the interaction between response speed and response social desirability has downstream consequences, we added guilt judgments. In this study, we test the impact of admitting vs. denying guilt – socially undesirable and desirable options respectively, on the effect of response speed on sincerity judgments, guilt judgments, and thought suppression inferences.

Method

Participants. We recruited 804 participants on Mechanical Turk (396 males, 408 females, M_{age} = 37.11, SD_{age} = 13.57). Thirty out of 804 participants (3.7%) failed an attention check by replying "Yes" to the questions "Have you ever had a fatal heart attack?" (presented at the end of the survey). We excluded them from analyses. The final sample therefore included 774 participants (373 males, 401 females, M_{age} = 36.57, SD_{age} = 12.63).

Procedure. Participants were randomly assigned to one of four conditions. In each condition, participants read two scenarios, in randomized order. In the first scenario, a husband, suspecting his wife Julie of cheating on him, confronted her by directly asking them whether she was cheating on him. Julie then replied to him either fast or slow, and either denying or admitting that she was cheating on him; in the second scenario, a man named John was suspected of having stolen money, and he replied either fast or slow, either denying or admitting that he had stolen the money. Scenarios are reported below (in brackets the variants included in the slow and the socially desirable condition respectively).

> Julie's husband suspects her of cheating on him. One night, he confronts her.
>
> He asks her: "Are you cheating on me?"
>
> Julie immediately (waits 10 seconds and) answers: "Yes, I did!" ("No I didn't!")

John is suspected of stealing about $2,000 from the cashier of the electronics store where he works.

His supervisor asks him: “Did you steal the money?”

John **immediately (hesitates about 10 seconds and)** answers: “Yes, I did!” (“No I didn’t!”)

Participants were then instructed to rate what they thought of each actor’s answer on four questions, all anchored at 1 (*Not at all*) and 7 (*Very much*): 1) “Sincere” and 2) “He/She means what he said”, which were averaged in two sincerity indices (both Cronbach’s α = .89); 3) “Another answer popped up in his/her head before she replied”, and 4) “Another thought popped up in his/her head before she replied”, which were averaged in an aggregated thought suppression inferences measure, Cronbach’s α = .94. Finally, participants were asked whether they thought either actor was guilty of committing the violation of which they were accused (Yes/No answer).

Results

Sincerity judgments. A mixed-model ANOVA with response speed and response social desirability as between-subjects factors, and scenario as within-subjects factor revealed a significant between-subjects main effect of response speed, $F(1,770) = 67.57$, $p < .001$, $\eta^2 = .023$, and a significant between-subjects main effect of response social desirability, $F(1,770) = 408.43$, $p < .001$, $\eta^2 = .136$, which were both qualified by our predicted result, a significant interaction between response speed and response social desirability, $F(1,770) = 64.08$, $p < .001$, $\eta^2 = .021$. When the answers were socially desirable (denying the violation), slow responses ($M = 2.55$, $SD = 1.41$) were considered significantly less sincere than fast responses ($M = 4.21$, $SD = 1.43$) than, $t(770) = 11.46$, $p < .001$, $d = 1.17$, 95% CI [0.95, 1.39], but when the response was socially undesirable (admitting the violation), there was no statistically

significant difference between the fast (M = 5.45, SD = 1.50) and the slow conditions, (M = 5.43, SD = 1.33), $t(770) = 0.15$, $p = .997$, $d < 0.01$, 95% CI [-0.20, 0.21].). Results are summarized in Figure S2. Further, the ANOVA found no significant within-subjects effect of scenario, $F(1,770) = .21$, $p = .65$, $\eta^2 < .001$, a significant mixed interaction between scenario and response speed, $F(1,770) = 9.41$, $p = .002$, $\eta^2 = .001$, indicating that the effect of response speed was larger in the woman scenario (but significant and in the same direction in both scenarios); no significant interaction between scenario and response, $F(1,770) = .08$, $p = .77$, $\eta^2 < .001$, and no significant mixed three-way interaction between scenario, response speed, and response, $F(1,770) = .37$, $p = .55$, $\eta^2 < .001$.

Thought suppression inferences. A mixed-model ANOVA with response speed and response social desirability as between-subjects factors and scenario as within-subjects factor revealed a significant between-subjects main effect of response speed, $F(1,770) = 218.27$, $p < .001$, $\eta^2 = .081$, showing that slower responders were considered to be suppressing thoughts to a higher degree than faster responders as predicted; no significant between-subjects main effect of response social desirability, $F(1,770) = 2.18$, $p = .14$, $\eta^2 < .001$, and no significant interaction between response speed and response social desirability, $F(1,770) = 2.53$, $p = .11$, $\eta^2 = .001$. On average, participants were more likely to report that slow responders were suppressing their thoughts in the slow condition (M = 4.90, SD = 1.65) compared to the fast condition (M = 3.16, SD = 1.64), $t(772) = 14.73$, $p < .001$, $d = 1.06$, 95% CI [0.91, 1.21]. The ANOVA also found a significant within-subjects effect of scenario, $F(1,770) = 6.48$, $p = .01$, $\eta^2 < .001$, such that the female actor was considered less likely to be suppressing thoughts in general; no significant mixed interaction between scenario and response speed, $F(1,770) = 2.31$, $p = .13$, $\eta^2 < .001$, no significant interaction between scenario and response, $F(1,770) = .11$, $p = .74$, $\eta^2 < .001$, and a significant mixed three-way interaction between scenario, response speed and response social desirability, $F(1,770) = 5.75$, $p = .017$, $\eta^2 < .001$, such that

the effect was slightly smaller but still statistically significant in the scenario in which the actor was a woman who denied she was cheating.

Guilt judgment. A repeated-measures logistic regression with scenario as the within-subjects factor and response speed, and response social desirability as between-subjects factors revealed a significant interaction between response social desirability and response speed, χ^2 (1) = 27.42, $p < .001$, as predicted. When the response was slow and socially desirable (denying guilt), the actor was considered guilty 83% of the time (315/380 total choices); when the response was fast and socially desirable, the participant was considered guilty 42% of the time (160/384 total choices). When responses were slow and socially undesirable (admitting guilt), the actor was considered guilty 90% of the time (352/392 total choices); when responses were fast and socially undesirable, the actor was considered guilty 85% of the time (326/384 total choices). Results are summarized in Table S5 and Figure S2. Further, the analysis found no significant effect of scenario, χ^2 (1) = .87, $p = .35$; a significant effect of response speed, χ^2 (1) = 78.24, $p < .001$, indicating that the actors were more likely to be judged guilty when they were responding slower; a significant effect of response social desirability, χ^2 (1) = 85.30, $p < .001$, indicating that, on average, the actors were more likely to be judged guilty when they were giving a socially desirable response; no significant interaction between scenario and response speed, χ^2 (1) = 2.68, $p = .10$; no significant interaction between scenario and response social desirability, χ^2 (1) = 1.66, $p = .20$; and no significant three-way interaction between scenario, response social desirability, and response speed, χ^2 (1) = .77, $p = .38$.

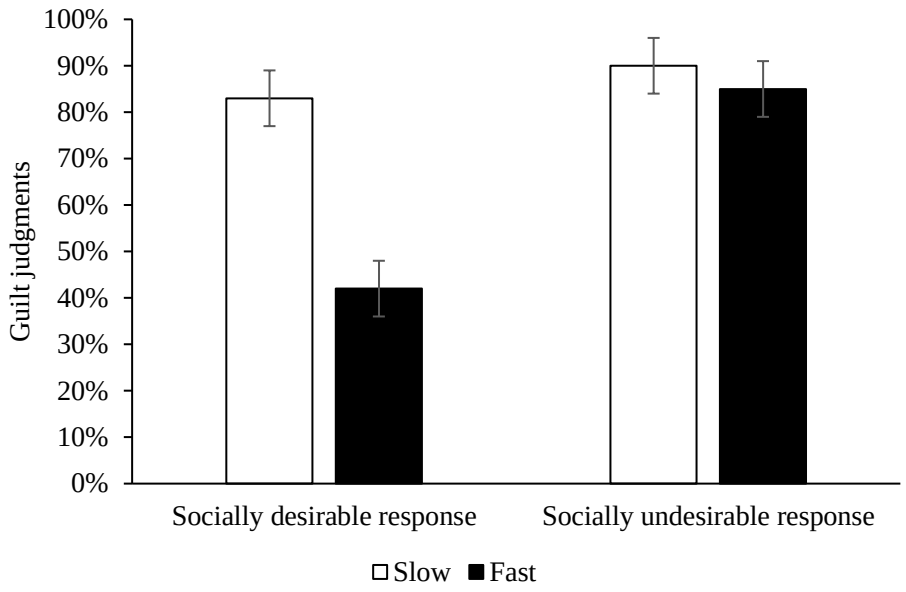

Figure S2. The effect of response speed and response social desirability on guilt judgments, *Study* S3. Error bars represent the standard error around the proportion.

Table S5

The effect of response speed and response social desirability on sincerity judgments and guilt judgments, Study S3

Actor	Response speed	Response social desirability	Sincerity judgments M (SD)	Thought suppression inferences M (SD)	Guilt judgment frequency (%)
Female actor	Slow	Undesirable (admitting)	5.37 (1.48)	4.83 (1.86)	176/196 (90%)
		Desirable (denying)	2.50 (1.51)	4.92 (1.67)	150/190 (79%)
	Fast	Undesirable (admitting)	5.55 (1.58)	2.94 (1.82)	165/192 (86%)
		Desirable (denying)	4.26 (1.61)	3.16 (1.69)	81/196 (41%)
Male actor	Slow	Undesirable (admitting)	5.19 (1.63)	4.83 (1.86)	176/196 (90%)
		Desirable (denying)	2.44 (1.50)	4.92 (1.67)	165/190 (87%)
	Fast	Undesirable (admitting)	5.39 (1.81)	2.94 (1.82)	161/192 (84%)
		Desirable (denying)	4.09 (1.77)	3.16 (1.69)	79/196 (40%)

Moderated mediation analyses. In order to test our theoretical model, we conducted separate moderated mediation analyses using PROCESS model 14 with sincerity judgment as the dependent variable, response speed as the independent variable, thought suppression inferences as the mediator, and response social desirability as the moderator. In both scenarios, a significant moderated mediation index was established, female: ab (SE) = 0.45 (0.12), 95% CI [0.23; 0.72]; male: ab(SE) = 0.53 (0.13), 95% CI [0.28; 0.79].

These analyses support the notion that, in both the admission and denial conditions, responses delays were considered evidence of thought suppression. However, only in the case of denial did they lead to lower sincerity judgments. In order to include guilt judgments in the model, we ran two separate moderated mediation analyses using model 58 of the PROCESS

SPSS macro. In these models, we used response speed as the independent variable, sincerity judgments as the mediator, and guilt judgments as the dependent variable. Response social desirability (admitting vs. denying guilt) was the moderator of both the relationship between response speed and sincerity judgments and of the relationship between sincerity and guilt judgments (since we expected that if someone is perceived to be sincere in confessing a crime, people are likely to judge him as guilty, and if someone perceived as sincere is denying a crime, people are likely to judge him as not guilty – the opposite pattern). The analyses (5000 bootstrap intervals) revealed two significant moderated mediation indices, female scenario: ab (SE) = 1.67 (0.33), 95% CI [1.06; 2.33]; male scenario: ab (SE) = 1.86 (0.31), 95% CI [1.27; 2.47]. To further show the mediating effect of thought suppression inferences, we ran two separate moderated mediation analyses using model 58 of the PROCESS macro. Again, response speed was used as the independent variable, thought suppression inferences was the mediator, guilt judgments as the dependent variable, and response social desirability was the moderator of both the relationship between response speed and thought suppression inferences and of the relationship between thought suppression inferences and guilt judgments. Both analyses (5,000 bootstrap intervals) revealed a significant moderated mediation index, male scenario: ab (SE) = 0.80 (0.20), 95% CI [0.45; 1.22]; female scenario: ab (SE) = 0.75 (0.18), 95% CI [0.42; 1.14].

Overall, these moderated mediation analyses support the notion that response speed affects guilt judgments through sincerity judgments and thought suppression inferences, and that the response social desirability moderates the link between sincerity judgments and thought suppressions inferences.

Discussion

In Study S3 we found an interaction between response speed and response social desirability on sincerity judgments, replicating the findings of Study 4. We also extended the

findings of existing studies by showing that guilt judgment seem to be affected by response speed and response social desirability in the same way sincerity judgments does: the effect of response speed on sincerity judgments and guilt judgments was large and statistically significant when the actor gave a socially desirable response (denied the accusation), but much reduced when the actor gave a socially undesirable response (admitted the accusation). To put simply: observers believed that slow denials are almost as much an indication of guilt as outright admissions of guilt.

Additional Analyses

Study 1a – Additional Analyses

The analyses in the main manuscript deviate from the preregistered analyses. We believe the analyses we report in the main manuscript are more appropriate, as we did not want to test for actor gender or situation effects in this study, but test our effect in several scenarios in order to add generality. In hindsight, we realized that an analysis that wishes to test for the effect of actor gender and situation per se should employ more carefully matched stimuli, which could exclude potential confounding effects of perceived social status, attractiveness, etc, which are outside of the purview of this work. Note that both these analyses and the analyses reported in the main paper yielded identical effect sizes and p-values for the effect of response speed on sincerity judgments. We report the preregistered analyses below.

Manipulation check. A 6 X 2 X 2 mixed-measures ANOVA with response speed as between-subjects factor and actor gender and scenario as within-subjects factors found a significant effect of response speed, $F(5, 1127) = 140.42$, $p < .001$, $\eta^2 = 0.315$, indicating that slower responses were perceived as, in fact, slower. We also found a main effect of actor gender, $F(1, 1127) = 3.98$, $p = .046$, $\eta^2 < .001$, indicating that the woman was perceived as slightly faster in responding compared to the man; a main effect of scenario, $F(1, 1127) = 24.48$, $p < .001$, $\eta^2 = .001$, indicating that the actors were considered faster in the cake scenario compared to the money scenario; and a mixed actor gender by scenario interaction, $F(1, 1127) = 11.67$, $p < .001$, $\eta^2 = .001$. Note that all these effects, while significant given the high statistical power of our result, are much smaller compared to the main effect of response speed (less than 1/300). We found a very small, but statistically significant actor gender by response speed interaction, $F(5, 1127) = 2.25$, $p = .047$, $\eta^2 = .001$, indicating that response speed had a larger impact for the male actor. Finally, we found no statistically significant

scenario by response speed interaction, $F(5, 1127) = 0.87$, $p = .50$, $\eta^2 < .001$, nor a three-way statistically significant scenario by response speed by actor gender interaction, $F(5, 1127) = 0.12$, $p = .12$, $\eta^2 < .001$.These analyses provided no support for the notion that the effect of response speed on perceived speed interacted with scenario or with the interaction between scenario and actor gender.

Table S7

The effect of response speed on perceived response speed (manipulation check), Study 1a

		Scenario			
		Man, money M (SD)	Man, cake M (SD)	Woman, money M (SD)	Woman, cake M (SD)
Response delay (seconds)	Zero	5.61 (1.25)	5.94 (1.10)	5.93 (1.10)	5.95 (1.13)
	One	4.92 (1.48)	5.10 (1.26)	4.89 (1.34)	4.90 (1.42)
	Two	3.62 (1.66)	3.94 (1.64)	3.89 (1.70)	3.85 (1.81)
	Three	3.06 (1.65)	3.46 (1.78)	3.42 (1.76)	3.42 (1.81)
	Five	2.85 (1.96)	3.07 (2.00)	2.81 (1.97)	3.04 (2.13)
	Ten	2.48 (1.96)	2.51 (1.98)	2.57 (2.03)	2.62 (2.06)

Note: perceived response speed was measured on a 1-7 scale.

Sincerity judgments. A 6 X 2 X 2 mixed-measures ANOVA with response speed as between-subjects factor and actor gender and scenario as within-subjects factors found a significant effect of response speed, $F(5, 1127) = 14.50$, $p < .001$, $\eta^2 = 0.038$, indicating that slower responses were perceived as less sincere. We also found a significant effect of actor gender, $F(1, 1127) = 38.63$, $p < .001$, $\eta^2 = 0.004$, indicating that overall, the female participants were perceived as more sincere; a significant effect of scenario, $F(1, 1127) = 139.44$, $p < .001$, $\eta^2 = 0.016$, indicating that participants were considered more sincere in the

cake scenario; and a significant mixed actor gender by scenario interaction, $F(1, 1127) = 231.01$, $p < .001$, $\eta^2 = 0.020$, indicating that the male actor in the cake scenario was considered more sincere than the male actor in the money scenario, while no such difference was detected for the female scenario. Importantly, none of these factors interacted with response speed, indicating that the effect of response speed on sincerity judgments did not systematically vary across actor gender, scenario, and their interaction. We found no statistically significant actor gender by response speed interaction, $F(5, 1127) = 0.67$, $p = .65$, $\eta^2 < .001$, no statistically significant scenario by response speed interaction, $F(5, 1127) = 2.72$, $p = .09$, $\eta^2 = .001$, and no statistically significant three-way interaction between actor gender, scenario, and response speed, $F(5, 1127) = 1.88$, $p = .12$, $\eta^2 = .001$.

Study 4 – Additional analyses

Moderated moderated mediation, memory effort as mediator. We conducted a moderated moderated mediation analysis using model 21 of the PROCESS macro for SPSS (5000 bootstraps; Hayes 2013), with the interaction between violation severity and temporal distance as the independent variable, memory effort judgments as the mediator, sincerity judgments as the dependent variable, and response speed as the moderator between memory effort judgments and sincerity judgments. This revealed a significant moderated moderated mediation index, ab (SE) = 0.29 (0.10), 95% CI [0.12; 0.53]. This analysis indicates that the effect of response speed is stronger when people are less likely to attribute response speed to a memory effort, which is influenced by the interaction of temporal distance and violation severity, such that people believe events of higher severity should require a low memory effort no matter whether they took place today or ten years ago but events of lower severity are highly affected by temporal distance. We note that we did not preregister this analysis, but a similar moderated moderated mediation with thought suppression as the mediator. However (with the benefit of the hindsight) we believe that the above is more correct and in line with

our theorizing, as thought suppression is not more likely to move with violation triviality and temporal distance, but memory effort is, as a trivial action in the distant past is harder to remember than actions closer in the past or more severe. We present the preregistered analysis below.

Moderated moderated mediation, thought suppression inferences as mediator. We preregistered and conducted a moderated moderated mediation analysis using model 21 of the PROCESS macro for SPSS (5000 bootstraps; Hayes 2013), with the interaction between violation severity and temporal distance as the independent variable, thought suppression inferences as the mediator, sincerity judgments as the dependent variable, and response speed as the moderator between memory effort judgments and sincerity judgments. This revealed a significant moderated moderated mediation index, ab (SE) = -0.01 (0.03), 95% CI [-0.08; 0.04]. This analysis indicates that the effects of the three-way interaction between response speed, violation severity and temporal distance on sincerity judgments were not mediated by thought suppression inferences. In hindsight, this is not surprising, as thought suppression inferences were affected by the interaction between response speed and temporal distance, but there is no reason why their effect on sincerity judgments should be moderated by violation severity.

Study 5 - Additional analyses

Moderated mediation analyses. In order to test whether the effect of response speed on guilt judgments was mediated by sincerity judgments but moderated by instructions to ignore, we conducted two separate moderated mediation analysis using model 7 of the PROCESS SPSS macro (5000 bootstraps), with response speed as the independent variable, sincerity judgment as the mediator, guilt judgment as the dependent variable, and instructions to ignore as the moderator between response speed and sincerity judgments. This yielded significant mediated moderation indices for the female scenario: ab (SE) = -1.32 (0.38), 95%

CI [-2.14; -0.62], but not for the male scenario: ab (SE) = -0.55 (0.37), 95% CI [-1.31; 0.16]. Note that since the two confidence intervals overlap, we cannot conclude that these effects are significantly different, but rather that one is significant and the other one is not.

Table S8

The effect of response speed and instructions to ignore response speed on sincerity judgments and guilt judgments, Study 5

		Sincerity judgments M (SD)	Guilt judgments frequency (%)
Woman scenario	Slow, simple	2.57 (1.33)	107/144 (74%)
	Slow, instruction	3.27 (1.46)	83/142 (59%)
	Fast, simple	4.41 (1.57)	39/138 (28%)
	Fast, instructions	4.19 (1.42)	49/143 (34%)
Man scenario	Slow, simple	2.59 (1.30)	108/144 (75%)
	Slow, instruction	3.09 (1.49)	87/142 (61%)
	Fast, simple	3.99 (1.28)	46/138 (33%)
	Fast, instructions	4.14 (1.45)	51/143 (36%)

Additional Materials

Study 2a – Additional Materials

The absence of randomization of scenario order makes it unfortunately impossible for us to distinguish between scenario effects (people thought actors were more sincere in a specific scenario) and order effects (whether people thought the first or the last Scenario had more sincere actors).

Scenarios Study 2a

Participants saw the scenarios in the fixed order Cola - Italian election – Sweaters-California election, in brackets, the Minority condition.

Colas scenario

Germany has a lively industry that produces independent Colas soft drinks. In particular, Afri-Cola and Fritz-Cola are very popular: in the independent Colas market segment, at a national level they both have about 25% market share. In Berlin, however, Afri-Cola is much more popular than Fritz-Cola. In Berlin, Afri-Cola has about 60% market share among independent Colas (most popular independent Cola), while Fritz-Cola has 8% market share (least popular independent Cola).

A local TV crew in Berlin is shooting a segment on independent Colas and chooses to separately interview two passersby, both males in their late 20s, in front of a small crowd. Their names are Bjorn and Felix.

When asked about which Cola he prefers, Bjorn **immediately** replies: “I prefer **Afri**-Cola! (Fritz-cola)”

When asked about which Cola he prefers, Felix **thinks about it for about 10 seconds** and replies: “I prefer **Afri**-Cola (Fritz-cola)!”

Italian election scenario

Acerra is an Italian electoral district in the suburbs of Naples. In the recent Italian elections (2018), the party M5S got 64% of the votes (first party), and the party UDC got 1% of the votes (last party in the election).

A local TV crew in Acerra is shooting a news segment the day after the vote took place and the results are well-known. Among passers-by, they pick two people and interview them separately in front of a small crowd. Their names are Enzo and Ciro, both males in their 30s.

When asked about what he voted, Enzo **immediately** replies: "I voted **M5S (UDC)**!"

When asked about what he voted, Ciro **thinks about it for about 10 seconds** replies: "I voted **M5S (UDC)**!"

High school scenario

Maples High School is located in Northern Indiana, in the suburbs of Fort Wayne. Their football team is rather good and followed in the city. The football teams' uniforms main color is blue. Blue is also the color of all the sports team of the high school. Maples High school has a rival – Hunterton High School, another suburb of Fort Wayne – that has a football team too, which has red as their main color.

In preparation of the match between the two high schools football teams, a local TV crew is interviewing local students at Maples high school in a busy hallway. They choose to separately interview two girls, Julie and Karin, and they start with a general question about their favorite color.

When asked which one is her favorite color, Julie **immediately** says: "My favorite color is **blue (red)**!"

When asked which one is her favorite color, Karin **waits about 10 seconds** and says: "My favorite color is **blue (red)**!"

California election scenario

In 2010, the Democratic candidate in the 53rd House District in California – in the suburbs of San Diego - received about 62% of the votes (first party), while the Libertarian one received about 4% (last party).

A local TV crew in one of the 53rd districts neighbourhoods was shooting a news segment the day after the vote took place and the results were well-known. Among passers-by, they picked two people and interviewed them separately in front of a small crowd. Their names were Max and Bob, both males in their 40s.

When asked about what he voted, Bob **immediately** replied: "I voted **Democratic (Libertarian)**!"

When asked about what he voted, Max **thinks about it for about 10 seconds** and replied: "I voted **Democratic (Libertarian)**!"

Study 4 – Additional Materials

Participants were randomly assigned to one of eight conditions in a 2 (response speed: fast vs. slow) X 2 (distance in time of the violation: recent past vs. distant past) X 2 (severity of the violation: low vs. high) between-subjects design. Participants read a scenario as below (in square brackets, the high severity condition, the distant past condition and the fast condition variants of the scenario)

John is accused of having stolen some candy [murdered a man] earlier today [10 years ago]. He is asked whether he did it and after about 10 seconds [immediately] he replies: "No, I didn't!"

Study 1b and Study 6 – Attention Check and Stimuli Video

Attention check video

https://www.youtube.com/watch?v=EiIFwV1NSec

Slow response speed, man actor

https://www.youtube.com/watch?v=kJXKRpyU4iU

Fast response speed, man actor

https://www.youtube.com/watch?v=BfyxD3J_WTo

Slow response speed, female actor

https://www.youtube.com/watch?v=PW2GG8j_83Q

Fast response speed, female actor

https://www.youtube.com/watch?v=qVzAlGt723g

Internal Meta-Analysis

To examine the overall magnitude of the effect of response speed (slow vs. fast) on perceived sincerity, we conducted an internal meta-analysis for the nine studies (Studies 1b, 2a, 2b, 3a, 4 – 6, and S1 - S3) in which this effect was tested. Analyses using Comprehensive Meta-Analysis (version 3) showed that the aggregated effect size (Cohen's *d*) of the difference between the slow and fast conditions was *d* = -0.75 (*N* = 5722) for perceived sincerity. This effect size is statistically significant, as indicated by the absence of zero within its confidence interval, 95% CI [-0.89; -0.61]. The forest plot for the present meta-analysis is presented below in Figure S3.

Model	Study name	Statistics for each study							Std diff in means and 95% CI
		Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value	-2.00 -1.00 0.00 1.00
	Study1b	-1.080	0.127	0.016	-1.329	-0.831	-8.485	0.000	
	Study2a	-0.605	0.145	0.021	-0.890	-0.320	-4.160	0.000	
	Study2b_sc	-0.934	0.049	0.002	-1.030	-0.838	-19.087	0.000	
	Study2b_sc	-1.052	0.051	0.003	-1.152	-0.952	-20.676	0.000	
	Study2b_sc	-0.954	0.049	0.002	-1.050	-0.857	-19.370	0.000	
	Study2b_sc	-1.013	0.050	0.003	-1.112	-0.915	-20.175	0.000	
	Study 3a	-0.690	0.151	0.023	-0.985	-0.395	-4.578	0.000	
	Study4_soci	-0.819	0.122	0.015	-1.058	-0.581	-6.735	0.000	
	Study4_soci	-0.303	0.117	0.014	-0.532	-0.073	-2.585	0.010	
	Study5_Lo	-0.968	0.146	0.021	-1.254	-0.682	-6.635	0.000	
	Study5_Lo	-0.266	0.149	0.022	-0.557	0.026	-1.788	0.074	
	Study5_Hig	-0.644	0.152	0.023	-0.942	-0.346	-4.235	0.000	
	Study5_Hig	-0.524	0.148	0.022	-0.814	-0.235	-3.554	0.000	
	Study6_Nol	-1.400	0.132	0.018	-1.659	-1.141	-10.576	0.000	
	Study6_Ign	-0.840	0.122	0.015	-1.079	-0.601	-6.875	0.000	
	StudyS1	-0.850	0.127	0.016	-1.099	-0.601	-6.694	0.000	
	StudyS2_S	-0.740	0.117	0.014	-0.969	-0.511	-6.332	0.000	
	StudyS2_S	-0.010	0.117	0.014	-0.239	0.219	-0.086	0.932	
	StudyS3_S	-1.170	0.112	0.013	-1.389	-0.951	-10.456	0.000	
	StudyS3_S	-0.010	0.104	0.011	-0.214	0.194	-0.096	0.924	
Random		-0.750	0.072	0.005	-0.891	-0.608	-10.396	0.000	

Figure S3. Forest Plot of the Internal Meta-Analysis for Effect of Response Speed on Perceived Sincerity.

Heterogeneity: Q = 228.00, df = 19, $p < .001$, $I^2 = 91.67\%$.