

## DESCARTES VERSUS SPINOZA: TRUTH, UNCERTAINTY, AND BIAS

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To comprehend a statement, do people first have to believe it is true? Spinoza argued yes, that people initially assume the truth of a statement and later revise if necessary. Descartes thought otherwise, that understanding comes prior to accepting or denying truth, and there can be initial periods of indecision. Spinoza's view has received empirical support from studies showing that when forced into a quick judgment, participants tend to accept the information as truthful. The "truth bias" evidence is compromised, however, by the fact that participants are only given the choice to say true or false. When participants are forced into making a binary judgment, they do indeed display the Spinozan truth bias, replicating earlier studies. But when allowed to indicate their indecision, raters appear distinctly Cartesian. We conclude beliefs are not automatically accepted, but that they can appear this way when participants are forced into passing judgment.

"God has given me the freedom to assent or not to assent in cases where he did not give me clear understanding..."

—Descartes (1641/1993)

"There is in the mind no volition, that is, affirmation or negation, except that which an idea, insofar as it is an idea, involves."

—Spinoza (1677/1982)

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How do people decide what to believe and what to disbelieve? When it comes to deciding whether to believe what someone else is saying, people are more likely to believe others are telling the truth rather than lying, dubbed the truth bias (Bond & DePaulo, 2006; Vrij, 2008). The “Spinozan” account (Gilbert, 1991; Gilbert, Krull, & Malone, 1990; Mandelbaum, 2014) proposes that understanding an assertion means having first to accept it as true automatically. It is only after the initial acceptance that people can consider rejecting the idea. In that sense cognition is considered a two-step process where the “unbelieving” stage follows automatic acceptance. In their seminal work, Gilbert and colleagues (1990) argued the Spinozan account explains why people are truth biased.

The Spinozan view can be contrasted with Descartes’s. The “Cartesian” account is able to comprehend an idea independently of assessing its veracity. Under this view, there is an initial period of non-decision and then evaluation; that is, a one-step evaluative process (see Gilbert, 1991; Gilbert et al., 1990). There is no automatic belief in what others are saying. Are we truth biased because we are Spinozan and automatically believe at first (e.g., Colwell et al., 2012; Vrij, 2008)? Although a number of findings appear to support a Spinozan position, the truth bias can be better explained as reflecting a Cartesian way of thinking, with no initial automatic bias.

The Spinozan account makes two primary claims. First, the initial automatic belief is followed in time by a more evaluative phase. Second, the evaluative phase is more cognitively effortful than the automatic belief stage. Research exploring the Spinozan account has considered temporal (Gilbert, 1991; Gilbert, Tafarodi, & Malone, 1993; Skurnik, Yoon, Park, & Schwarz, 2005; see also Masip, Garrido, & Herrero, 2006; Unkelbach, 2007), cognitive effort (Hasson, Simmons, & Todorov, 2005), and other predictions (Gilbert et al., 1990, Studies 2 and 3) made by the account. The current article explores the temporal aspect.

We argue findings that seem to support a Spinozan view (Clark & Chase, 1972; Snyder & Campbell, 1980) can be accommodated equally by a modified Cartesian view. Under our account, comprehension begins with a period of uncertainty. Knowledge and past experiences can bias initial uncertainty *toward* believing a statement (see Clark & Chase, 1972; Mayo, Schul, & Burnstein, 2004). This bias toward believing others may appear as an automatic truth assumption when participants are forced into a truth or lie judgment. In other words, people do not automatically assume the truth of a statement. We suggest they may instead have a preferential bias dependent on experiential or situational factors that in general biases them toward believing, and if forced to judge they will hedge more toward believing than disbelieving.

There is some evidence that the preference for believing can be modified, which, importantly, should not be possible under the Spinozan explana-

tion of an automatic truth judgment. Biases toward the truth could come from experience (DePaulo, Kashy, Kirkendol, Wyer, & Epstein, 1996; Grice, 1975) and expectations (Schroeder, Richter, & Hoever, 2008; Street & Richardson, 2014), and from the available context (e.g., “people are innocent until proven guilty”: O’Sullivan, 2003; Pennington & Hastie, 1991).

Lie detectors certainly take the context of the speakers’ situation into account when making their judgments (Blair, Levine, & Shaw, 2010; Bond, Howard, Hutchinson, & Masip, 2013; Levine, 2014; Street, 2013; Street & Richardson, 2014; see also Wyer & Radvansky, 1999). When the context suggests speakers are likely to be misleading, raters show a bias toward believing people are *not* telling the truth (Blair, 2006; DePaulo & DePaulo, 1989; Meissner & Kassin, 2002), even during the earliest moments of judgment formation (Street & Richardson, 2014). When people are made to feel suspicious, the bias shifts toward doubting (Masip, Alonso, Garrido, & Herrero, 2009), and again this has been found even during the earliest moments of consideration (Deutsch, Kordts-Freudinger, Gawronski, & Strack, 2009), as though automatic. Additionally, there is some evidence that the truth bias actually *increases* over time (Feeley, deTurck, & Young, 1995; Hasher, Goldstein, & Toppino, 1977; Street & Richardson, 2014), even when they are repeatedly told that the information they are receiving is false (Skurnik et al., 2005). Raters can appear anti-Spinozan in certain contexts.

In light of the evidence, we argue that the preference toward one response should not be taken as evidence that people *automatically* believe what they hear is the truth, but simply that it is the *avored alternative* if a judgment were to be elicited at that moment. Indeed, having an early bias toward believing the speaker is adaptive (even before the speaker has begun delivering his or her statement): in the long run it will be more accurate than random guessing because speakers usually do tell the truth (DePaulo et al., 1996; Serota, Levine, & Boster, 2010).

We have argued prior research has not conducted a fair test of the Cartesian account because raters are always required to make a judgment—even if they are uncertain, as the Cartesian account predicts. Here we contrasted the accounts by giving some participants the option to explicitly indicate their uncertainty and other participants a forced binary choice. If the Spinozan account is correct, there should be an early bias toward believing. We show that when raters do not have to make a forced binary choice, there is no longer a bias toward believing.

To test the modified Cartesian account, we examined how raters form their response over time, as other research consistent with a Spinozan account has done (e.g., Gilbert et al., 1990, 1993; Skurnik et al., 2005).

## METHODS

### MATERIALS

We used the Bloomsbury Deception Set (BDS; Street et al., 2011) as our to-be-rated lies and truths. A full description can be found in Street and Richardson (2014). Speakers were sampled randomly on the street. If they agreed to an “assistant director’s” request to take part in a travel and tourism documentary, they were probed for places they had been on holiday. As a favor to the assistant, the speakers agreed to give one honest account but also one invented account of a holiday they had been on so as to help out the assistant collect statements about all the countries he needed to collect.

After agreeing they were shown to a real-life filming studio and were left alone with the director. As far as the participants knew, the director was unaware of the deception. The director explained the statements would also form part of his anthropological research efforts and stressed the importance of gathering true accounts. All speakers then signed a document saying they would only tell the truth, and then proceeded to deliver one honest and one deceptive account (order counterbalanced). At the end of the experiment participants provided retrospective fully informed consent.

This procedure resulted in two video sets, each containing 18 speakers, plus two practice trials. The speakers appeared only once in each set, with their lie in one and their truth in the other. Each set contained nine lies and nine truths.

### PARTICIPANTS

Forty-six rater participants were compensated £3. One participant was excluded because they made a single key press at the start of each video rather than providing a continuous response throughout the video. This left 25 females and 20 males ( $M_{\text{age}} = 26.0$  years,  $SD = 7.7$  years, range 18 to 54 years).

### PROCEDURE

The written instruction explained that each speaker would lie or tell the truth about people they claimed to have met in a foreign country. Throughout each statement, participants indicated moment by moment whether they currently believed or disbelieved the speaker by holding in either the Z or C keys while the speaker delivered his or her statement (key assignment counterbalanced). Participants were instructed to begin responding at the onset of each video and to continue responding all the time the

speaker was delivering his or her statement, switching their response as their opinion changed over time.

Participants in the lie-truth (LT) condition ( $n = 23$ ) indicated throughout the video whether the speaker was lying or telling the truth. Participants in the lie-truth-unsure (LTU) condition ( $n = 22$ ) were given the additional option of indicating their uncertainty by using the X key. At the end of each video participants in both conditions made a final binary lie-truth response. There were two practice videos, after which the instruction was presented again and the remaining 18 experimental trials given.

The selected video set, the position of the lie and truth response options on the screen for the final binary choice, and whether participants were asked if the last speaker was “lying or telling the truth” versus “telling the truth or lying” were fully counterbalanced between participants and conditions.

## DESIGN

The independent variables were the in-trial response conditions (LT or LTU), the veracity of the speakers' statements and the proportional time that had elapsed. For ease of analysis, the proportional time was binned into five discrete time points. The dependent variable was the proportion of truth judgments, resulting in a 2 (response condition: LT or LTU, between subjects)  $\times$  2 (speaker veracity: lie or truth, within subjects)  $\times$  5 (time point, within subjects) mixed design.

## RESULTS

During the early moments of processing there was a bias toward truth believing, replicating Gilbert et al. (1990) and appearing to support the Spinozan account. This bias was only present, however, among those forced into making a binary lie-truth decision. Those able to indicate their indecision showed no such bias, instead exhibiting a pattern of responding consistent with a Cartesian rater. The Greenhouse Geisser correction was used when assumptions of sphericity were violated.

### TIME COURSE OF THE TRUTH BIAS

Although participants were instructed to begin responding from video onset, most did not. The time until the first key-press averaged 4.23 s ( $SD = 3.66$ ) in the LT and 3.05 s ( $SD = 2.06$ ) in the LTU condition. An independent samples  $t$ -test did not find a statistically significant result, although a medium effect was observed,  $t(43) = 1.41$ ,  $p = 1.65$ ,  $d = 0.40$ . This could suggest

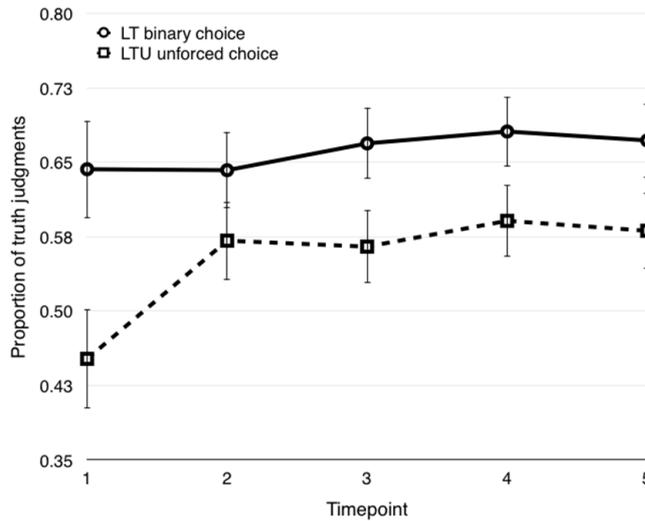


FIGURE 1. The proportion of truth judgments made in the LT and LTU conditions across the duration of the trial, split into five equal proportional time bins. Bars represent standard errors. Note that the unsure responses from the LTU condition have been removed, and that chance PTJ lies at 0.5 for both the LT and LTU conditions.

raters were prepared to begin responding earlier when they had the unsure button as an option.

The presence of an additional response could decrease the proportion of truth judgments (PTJ). To prevent this, and to allow for comparisons between the LT and LTU conditions, the PTJ of all the lie-truth responses was calculated. That is, in the LTU condition the unsure responses were discarded entirely. If they were kept, chance responding would be at 0.33 because responses would be expected to be equally distributed among the three options. By discarding the unsure responses and examining only the use of the lie and truth buttons in the LTU condition, an equal (unbiased) distribution between these two responses would be 0.5, the same as is the case of the LT condition. Thus a truth bias would be indicated with a PTJ greater than half the responses made, irrespective of experimental condition. All analyses discard the unsure responses unless otherwise stated.

Since stimulus speakers provided spontaneous speech, we could not impose strict durations for their statements. They varied from 10 to 91 seconds, with the average statement lasting 32.79 s ( $SD = 18.83$ ). To compare across items the PTJ was binned into five equally spaced time points. In the following section the data are reanalyzed exploring the first 2 to 10 seconds of the judgment period. It is during these early moments of processing that Gilbert et al. (1990) found a Spinozan truth bias. To anticipate those analyses, the findings exploring the first 10 seconds mirror those exploring the proportional time across the course of the statement.

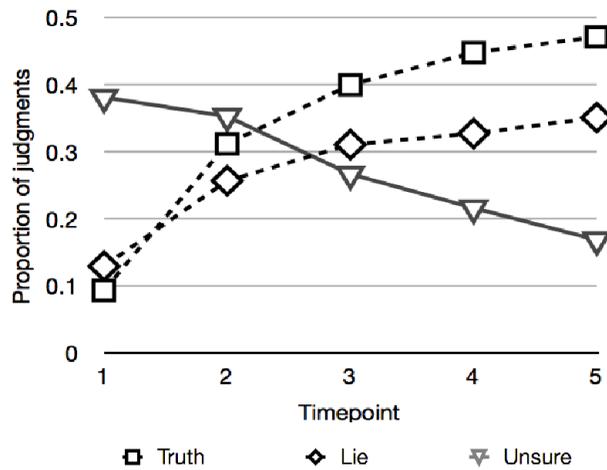


FIGURE 2. The proportion of truth (square), lie (diamond), and unsure (inverted triangle) responses across the proportional duration of the statement. Unsure responses are relatively high during the early stages of processing and decline over time in favor of lie and truth responses.

Supporting the hypothesis, a 2 (response condition: LT or LTU, between)  $\times$  2 (speaker veracity: lie or truth, within)  $\times$  5 (time point:  $t_1$  to  $t_5$ , within) mixed ANOVA showed a main effect of response condition,  $F(1, 43) = 5.57$ ,  $p = .023$ ,  $\eta_p^2 = 0.12$ , Figure 1. Having the option to indicate indecision resulted in a smaller truth bias both during the early moments of processing and across the remainder of the trial, compared to raters who were forced into a binary response. This main effect was not moderated by time point or speaker veracity,  $F_s < 1.80$ ,  $p_s > .1$ ,  $\eta_p^2s < 0.04$ .

There was a main effect of time,  $F(1.43, 61.56) = 3.81$ ,  $p = .041$ ,  $\eta_p^2 = 0.08$ , which interacted with veracity,  $F(2.16, 92.95) = 5.94$ ,  $p = .003$ ,  $\eta_p^2 = 0.12$ . Post-hoc Bonferroni-corrected  $t$ -tests indicated that the PTJ did not change significantly over time when rating deceptive statements (all  $|t|s < 2.28$ ,  $p_s > .1$ ,  $|d|s < 0.23$ ), but when rating truthful statements the PTJ increased from  $t_1$  to  $t_2$ ,  $t(44) = -3.60$ ,  $p = .006$ ,  $d = -0.33$ , and from  $t_2$  to  $t_3$ ,  $t(44) = -3.05$ ,  $p = .046$ ,  $d = -0.27$ , but did not increase further (all  $|t|s < 0.20$ ,  $p_s > .1$ ,  $|d|s = 0.03$ ). That is, the PTJ ran counter to the predictions of a Spinozan account.

## CARTESIAN RESPONDING

Confirmatory support for a Cartesian mind can be found in the way in which raters use the unsure response option. A Cartesian account predicts a high proportion of uncertainty early on that declines over time.

A one-way ANOVA conducted on the proportion of unsure responses across the five time points found a significant effect of time point,  $F(1.40, 29.41) = 11.92$ ,  $p = .001$ ,  $\eta_p^2 = 0.36$ , Figure 2. Bonferroni-corrected  $t$ -tests found the proportion of unsure responses at time point 1 ( $M = .38$ ,  $SD = .28$ ) did not differ significantly from time point 2 ( $M = .35$ ,  $SD = .23$ ) or 3 ( $M = .27$ ,  $SD = .15$ ), both  $|t|s < 1.04$ ,  $ps > .1$ ,  $|d|s < 0.36$ , but was significantly greater than at time points 4 ( $M = .22$ ,  $SD = .14$ ) and 5 ( $M = .17$ ,  $SD = .12$ ), both  $|t|s > 3.20$ ,  $ps < .036$ ,  $|d|s > 0.52$ . Similarly, unsure responses at time point 2 were significantly greater than at points 4 and 5 (both  $|t|s > 3.67$ ,  $ps < .013$ ,  $|d|s > 0.51$ ), but not at time point 3,  $t(44) = 2.87$ ,  $p = .087$ ,  $d = 0.32$ . Unsure responses at time point 3 were marginally significantly greater than at time point 4,  $t(44) = 3.00$ ,  $p = .062$ ,  $d = 0.25$ , and unsure ratings at time point 4 were significantly greater than at time point 5,  $t(44) = 5.33$ ,  $p = .001$ ,  $d = 0.26$ . Thus across the course of the statement the proportion of unsure responses was seen to decline, as would be predicted by a Cartesian but not a Spinozan account.

## DISCUSSION

The Spinozan account predicts that belief precedes disbelief. As Gilbert and colleagues (1990, p. 601) put it, "all ideas are accepted...*prior* to a rational analysis of their veracity, and that some ideas are subsequently *unaccepted*." A number of studies have tested this prediction: some studies support the Spinozan position (Gilbert et al., 1993) while others do not (Skurnik et al., 2005; see also Unkelbach, 2007). We considered whether raters appear Spinozan in certain situations—when they must make a judgment but are unsure.

The general Spinozan phenomenon was replicated: raters were biased toward believing what others said when making a forced binary choice, even during the early moments of processing. But if they were able to indicate indecision, people were Cartesian. There was a strong tendency toward being uncertain early in the judgment process. After removing the unsure responses, raters in the unforced choice condition were no more likely to judge a statement as honest than deceptive. These findings are inconsistent with a Spinozan account of the truth bias. It seems people do not merely believe what they are told: they can comprehend without having to automatically assign a belief value.

Models of judgment formation have often taken a Cartesian approach, assuming uncertainty rules at first until some threshold or condition is met, but from the outset the judgment can be biased toward preferring one alternative (e.g., Roe, Busemeyer, & Townsend, 2001). Prior experience and current expectations (DePaulo et al., 1996; Deutsch et al., 2009) can bias the judgment from the outset. When unsure but required to make a judgment, the logical choice would be to select the option to which people are biased.

It is important to consider that when forced to judge, participants were truth biased rather than making an unbiased guess. This is consistent with our view that this reflects an early preference, which we argued is guided by context-specific knowledge. But it could be argued the truth bias is a form of defaulting to believe when uncertain (Jacoby, 1991; Levine, 2014; Payne & Iannuzzi, 2012). This contrasts with our account because it claims the bias is a relatively inflexible, fixed default that people fall back on either when there is no reason to engage with more effortful processing, or when such effortful processing fails to give a sufficiently definitive judgment outcome.

Unlike these default accounts, we argue that the early bias will adapt to the context. Wyer and Radvansky (1999), for example, argue that people can quickly access their prior knowledge and expectations, and that this information can inform the judgment during the earliest moments of consideration. That is, if the context leads us to believe people will generally be deceptive, there should be evidence of an early bias toward *disbelieving*, not believing, which has been shown (Street & Richardson, 2014). Thus the direction of the bias appears sensitive to context, and we favor a more flexible and functional view of the bias as guided by context. However, it will be interesting to see how default versus context-dependent accounts of the truth bias play out in future research.

Note there is no contradiction between having an early bias toward a particular belief and being accurate: all that is required is that the world is also biased. People tell the truth more often than they lie (DePaulo et al., 1996; Grice, 1975; Serota et al., 2010), and so it can be accurate to be biased toward judging people as telling the truth. We are not claiming people should not hold these early preferences. In fact, they can be beneficial (see Levine, 2014; Richter, Schroeder, & Wöhrmann, 2009; Street, 2013). Rather, when uncertain a rater can *appear as though* they are automatically accepting statements as true when really they are making a guess.

On reviewing the literature, Gilbert (1991) rejected the Cartesian account. This rests primarily on two effects: (i) people are quicker to process affirmed than negated information, and (ii) that they prefer to make use of confirming rather than disconfirming information. Yet there is increasing evidence that these phenomena arise from the structure of the task (i.e., they are context-dependent) rather than from the structure of a Spinozan mind (Hasson et al., 2005; Mayo et al., 2004; Nadarevic & Erdfelder, 2013).

First, negated statements have classically been considered to require an extra processing step (e.g., “the eagle [was/was not] in the sky”: Clark & Chase, 1972; Clark & Clark, 1977). However, negations are typically underspecified and so offer various interpretations: the eagle may be on the floor, in the nest, and so on (Glenberg, Robertson, Jansen, & Johnson-Glenberg, 1999). Processing these alternatives takes time. The affirmed proposition, though, is fully specified and so requires processing of only one interpretation. Research shows that when negations afford the fewer interpretations

they are processed *faster* than affirmed propositions (Glenberg & Robertson, 1999; Glenberg et al., 1999). It is as though there are more degrees of freedom with negated statements, but when that is accounted for the differences between negations and affirmations seems to disappear.

Relatedly, Hasson and Glucksberg (2006) have shown that negated metaphors are initially represented as though they were affirmed statements (e.g., “this kindergarten [is/isn’t] a zoo”). Although we are accounting for data after the fact, it would be possible to explain this finding under this same degrees of freedom explanation. If the kindergarten is not a zoo, then what is it that the speaker is communicating? That the kindergarten is, but should not be, busy and untidy? That it currently is neither busy nor untidy, and so is not like a zoo? Note that the first interpretation is similar to what would be inferred from the affirmation, and may itself account for the finding that the affirmed and negated metaphors appear to be similarly represented in the mind.

It would seem negated propositions are not processed in two distinct steps as per a Spinozan system, but rather require a single process (Huettenlocher, Anderson, Matlock, & Spivey, 2010) as per a Cartesian rater, with the duration of that process dependent on the number of viable alternative interpretations that can be considered. Put another way, it seems that the effect does not reside in the necessity to override an automatic affirmation, but rather in the amount of cognitive effort required—regardless of whether the statement is affirmed or negated.

This interpretation of the negated disadvantage phenomenon, offered by others before us (Glenberg et al., 1999), aligns well with our informed Cartesian account. If one considers uncertainty as the degrees of freedom there are for interpretation, then as uncertainty in the correct interpretation declines (i.e., as the number of viable alternatives decreases) processing times decrease. It is the statement with the smallest degree of uncertainty that is processed faster, as a number of studies show (Glenberg et al., 1999; Hasson et al., 2005).

Second, automatic encoding of information should also impact the way new information is sought, according to the Spinozan claim (Gilbert, 1991). It claims people test hypotheses about the world by seeking evidence confirming their beliefs, called the confirmation bias (Snyder & Campbell, 1980). However, some researchers have questioned whether there is a confirmation bias at all. The hypotheses in these studies are of the form that would be used if one already knew the hypothesis to be true (e.g., “You are introverted”). In this case it would be normative to seek confirmatory evidence. In their review Higgins and Bargh (1987; see also Evans, 1998) note that a number of studies show no preference for confirming evidence when the disconfirmatory hypothesis is explicitly presented (“You are extroverted”). As above, the preference for confirming one’s beliefs only exists when the confirmatory hypothesis has a single construal (e.g., “I am introverted”) and the alternative disconfirmatory hypothesis is underspec-

ified and can be considered from many angles (e.g., “I am introverted in some situations,” “I am introverted around certain people,” “I am a little introverted”). There appears again to be an imbalance in the degrees of freedom.

As a final consideration, it is worth noting we did not add a cognitive load as other research has done (e.g., Gilbert et al., 1990). Had we done so, we would predict the forced choice condition would rely even more on a context-relevant truth bias. This, we would claim, is because raters would be uncertain on those additional trials where a cognitive load was present. As such, we would expect those in the unforced choice condition to show even greater uncertainty during those early moments. Future research should seek to test the informed Cartesian account with a cognitive load manipulation.

Our study has aligned the conflicting findings from the Spinozan and Cartesian camps by highlighting the conditions in which a person can come to appear Spinozan—not as the result of the structure of the mind but rather as a structure of the task. When a Cartesian rater is forced to affirm or deny a belief they appear distinctly Spinozan, but when able to express their indecision they appear Cartesian. The mind is able to comprehend information before having accepted or denied it as the truth. Yet if pressed for a judgment before one has been reached, we are sufficiently flexible to be able to incorporate prior knowledge and experience into the judgment to make an informed guess.

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