

Personality and Social Psychology Bulletin

<http://psp.sagepub.com/>

Does Fast or Slow Evaluation Foster Greater Certainty?
Zakary L. Tormala, Joshua J. Clarkson and Marlene D. Henderson
Pers Soc Psychol Bull 2011 37: 422
DOI: 10.1177/0146167210397378

The online version of this article can be found at:
<http://psp.sagepub.com/content/37/3/422>

Published by:



<http://www.sagepublications.com>

On behalf of:



[Society for Personality and Social Psychology](#)

Additional services and information for *Personality and Social Psychology Bulletin* can be found at:

Email Alerts: <http://psp.sagepub.com/cgi/alerts>

Subscriptions: <http://psp.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

Citations: <http://psp.sagepub.com/content/37/3/422.refs.html>

Does Fast or Slow Evaluation Foster Greater Certainty?

Zakary L. Tormala¹, Joshua J. Clarkson²,
and Marlone D. Henderson³

Personality and Social Psychology Bulletin
37(3) 422–434
© 2011 by the Society for Personality
and Social Psychology, Inc
Reprints and permission:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/0146167210397378
http://pspb.sagepub.com



Abstract

This research investigates the effect of perceived evaluation duration—that is, the perceived time or speed with which one generates an evaluation—on attitude certainty. Integrating diverse findings from past research, the authors propose that perceiving either fast or slow evaluation can augment attitude certainty depending on specifiable factors. Across three studies, it is shown that when people express opinions, evaluate familiar objects, or typically trust their gut reactions, perceiving fast rather than slow evaluation generally promotes greater certainty. In contrast, when people form opinions, evaluate unfamiliar objects, or typically trust more thoughtful responses, perceiving slow rather than fast evaluation generally promotes greater certainty. Mediation analyses reveal that these effects stem from trade-offs between perceived rational thought and the perceived ease of retrieving an attitude. Implications for research on deliberative versus intuitive decision making are discussed.

Keywords

attitudes, certainty, confidence, familiarity, accessibility, metacognition

Received May 21, 2010; revision accepted October 23, 2010

Psychological certainty is a core aspect of social and evaluative judgment. People generally seek certainty in their thoughts, beliefs, and opinions, but not everyone achieves it. Indeed, two individuals can hold the exact same judgment on a topic—for example, a public health option, a federal bailout, an ethnic group, or even a vacation destination—yet differ dramatically in the certainty with which they hold that judgment. In past research exploring metacognitive processes in social and evaluative judgment, psychological certainty has received considerable scrutiny, with researchers investigating what certainty is, where it comes from, and what it does (see Petty, Briñol, Tormala, & Wegener, 2007).

Within this domain, a great deal of attention has been paid to *attitude certainty*. In essence, attitude certainty refers to the subjective sense of conviction, confidence, clarity, or correctness one has about one's attitude (Gross, Holtz, & Miller, 1995; Tormala & Rucker, 2007). This construct has stimulated interest at least partly because it is known to have a number of important consequences. For example, attitude certainty plays a crucial role in determining an attitude's stability over time, its openness to persuasion, and its impact on behavior and information processing (e.g., Bassili, 1996; Clarkson, Tormala, & Rucker, 2008; Fazio & Zanna, 1978; Pomerantz, Chaiken, & Tordesillas, 1995; Tormala, Clarkson, & Petty, 2006; Visser & Mirabile, 2004). Recent research

suggests that becoming more certain of an attitude can even boost one's self-certainty (Clarkson, Tormala, DeSensi, & Wheeler, 2009). Given the clear importance of attitude certainty, considerable research has been devoted to understanding its origins. To highlight just a few examples, researchers have identified direct experience (Fazio & Zanna, 1978), repeated expression (Petrocelli, Tormala, & Rucker, 2007), social consensus (Visser & Mirabile, 2004), two-sided messages (Rucker, Petty, & Briñol, 2008), and action-oriented mind-sets (Henderson, de Liver, & Gollwitzer, 2008) as powerful determinants.

Perceived Evaluation Duration

In the current research, we explore the effect of a new antecedent—*perceived evaluation duration*—which we define as the subjective speed with which one generates an evaluation

¹Stanford University, Stanford, CA, USA

²University of Florida, Gainesville, FL, USA

³University of Texas at Austin, Austin, TX, USA

Corresponding Author:

Zakary L. Tormala, Stanford University, Graduate School of Business,
518 Memorial Way, Stanford, CA 94305
Email: tormala_zakary@gsb.stanford.edu

of an object, or the perceived amount of time one takes to produce that evaluation. Perceived *slow* evaluation refers to the situation in which one believes one has taken a long time to evaluate something, whereas perceived *fast* evaluation refers to the situation in which one believes one has taken a short time to evaluate something. For example, after opening a new bottle of wine, one person might quickly sniff it and state, “This is great!” the moment the first drop hits his or her tongue. Another person might reach the exact same assessment, but only after taking more time to carefully smell the bouquet and try a few sips. We use the terms *fast evaluation* and *slow evaluation* to describe these respective instances, and we explore the effect of perceiving fast or slow evaluation on attitude certainty. At first blush, this might seem like a straightforward question. However, past research points to two different, almost paradoxical, predictions. One view suggests that fast evaluation should foster greater certainty, whereas an alternative view suggests that slow evaluation should foster greater certainty. Thus, distinct literatures support positive and negative main effect hypotheses.

Fast Evaluation → More Certainty

First, consider the view that perceiving fast evaluation promotes greater certainty. Support for this hypothesis comes from a vast body of research. For example, numerous studies have documented a relation between attitude accessibility and attitude certainty (Bizer, Tormala, Rucker, & Petty, 2006; Fazio, 1995; Holland, Verplanken, & van Knippenberg, 2003; Petrocelli et al., 2007). The consistent finding is that the more accessible an attitude is—or the less time it takes one to retrieve or express that attitude—the more certain one will be. One account for this effect is that the faster an attitude can be reported, the more diagnostic it seems to be of one’s true thoughts and feelings (Fazio, 1995). Other scholars have argued that accessible information seems valid and perceived validity, in turn, boosts certainty (Begg, Anas, & Farinacci, 1992; Kelley & Lindsay, 1993).

Related findings come from the literature on processing fluency. This work shows that, in general, the feeling of ease or fluency leads to greater certainty than does the feeling of difficulty (e.g., Gill, Swann, & Silvera, 1998; Haddock, Rothman, Reber, & Schwarz, 1999; Simmons & Nelson, 2006; Tormala, Petty, & Briñol, 2002; also see Alter & Oppenheimer, 2009). For example, Haddock et al. (1999) found that people feel more certain of their attitudes when it is easy rather than difficult to generate proattitudinal arguments. Similarly, in research on decision inferences, Liberman and Förster (2006) found that when people have an easier time deciding between alternatives, they infer that they clearly favor one alternative over another, and perceived clarity is an established determinant of attitude certainty (Petrocelli et al., 2007). To the extent that fast evaluation

feels more fluent than slow evaluation, then, the fluency literature gives reason to expect fast evaluation to boost certainty.

In addition to the accessibility and fluency accounts, recent research on thought speed supports the hypothesis that fast evaluation should promote certainty. In this work, Pronin and colleagues (for a review see Pronin & Jacobs, 2008) have examined the link between thought speed, defined as the number of thoughts one has per unit time, and subjective experience. Most germane to the current concerns, they have found that fast, compared to slow, thinking elevates mood and increases feelings of power (also see Sackett, Meyvis, Nelson, Converse, & Sackett, 2010). Both happy mood and feelings of power, in turn, have been shown to increase subjective certainty (e.g., Briñol, Petty, & Barden, 2007; Briñol, Petty, Valle, Rucker, & Becerra, 2007; Tiedens & Linton, 2001).

Slow Evaluation → More Certainty

In contrast to the aforementioned research, there also is reason to believe that perceiving slow evaluation can build greater certainty. First, studies in impression formation document that although having more time to form an impression of a target does not increase impression accuracy, it does yield greater impression certainty (e.g., Willis & Todorov, 2006). Willis and Todorov (2006) surmised that increased time does not change the impression itself but rather facilitates justification for the impression. This justification process could lead people to believe they have been more rational or careful in their decision making when they take their time to evaluate slowly, which positively contributes to certainty in the evaluation they reach.

Similarly, persuasion studies reveal that people feel more certain of their attitudes when they believe they have been thoughtful in arriving at them. For example, Barden and Petty (2008; also see Smith, Fabrigar, MacDougall, & Wiesenath, 2008) found that greater perceived thoughtfulness while processing a persuasive message led people to become more certain of their postmessage attitudes, even when actual processing did not differ. They argued that people generally believe that more accurate judgments are reached when they direct more extensive thought to those judgments. In related research, Wan, Rucker, Tormala, and Clarkson (2010) explored the effect of regulatory depletion on attitude certainty. They found that when individuals received advertisements under conditions of depletion (vs. nondepletion), they felt more certain of their subsequent attitudes because they misattributed their fatigue to thorough ad processing. Assuming greater thought or processing is inferred from slow evaluation, then, the persuasion literature suggests that slow evaluation should boost certainty.

Finally, indirect evidence comes from research on resistance to persuasion. Tormala et al. (2006), for instance, introduced participants to a counterattitudinal policy and then

presented them with a message advocating that policy. Message recipients were induced to counterargue the message and were asked to type their counterarguments into a box on a computer screen. Of importance, however, they were given either sufficient (long) or insufficient (short) time to do so. Results indicated that although all participants resisted the message, on average, those who received sufficient time to articulate their arguments were more certain after doing so compared to those who received insufficient time. Thus, having more time to consider an argument and defend one's attitude can be associated with greater attitude certainty, which points to a potential link between slow evaluative processing and greater certainty.

An Integration

In short, past research from different literatures reflects disparate findings related to how perceived evaluation duration (PED) should influence attitude certainty. We seek to integrate these divergent perspectives to better understand the nature of the effect. In contrast to either main effect prediction outlined already, we posit that PED can have a positive or negative impact on attitude certainty depending on specifiable situational and individual difference factors. In the current research, we explore three potential moderators: (a) whether one is forming or expressing an attitude, (b) whether one evaluates an unfamiliar or familiar object, and (c) whether one holds the lay theory that gut reactions or thoughtful analyses are more trustworthy bases for judgment. We consider each possibility in turn.

Formation Versus Expression

First, the effect of PED might depend on whether an individual is focused on forming or expressing an attitude. This is a noteworthy distinction in modern society as people—more than ever before—are called on to both form (e.g., decide whether they like or dislike) and express (e.g., share that like or dislike) their attitudes toward various objects and issues. Indeed, social networking and customer rating websites abound on the Internet and ask individuals to form and express their attitudes with increasing frequency. Thus, exploring attitude formation versus expression could deepen our insight into how metacognitive appraisals of attitudes are shaped not only by people's reflections on how quickly or slowly they arrived at those attitudes but also by their reflections on how quickly or slowly they could share those attitudes with others. We submit that when people reflect on how they formed their attitudes, slow evaluation generally will yield greater certainty because slow evaluation implies that they have taken the time to be thoughtful or rational in determining their opinions. In contrast, when people reflect on how they expressed their attitudes, we hypothesize that fast evaluation will foster greater certainty because fast

evaluation in this context implies that an attitude is easily accessible and thus diagnostic or valid, as outlined earlier. Therefore, we predict an interaction pattern whereby slow evaluation promotes attitude certainty under formation focus and fast evaluation promotes attitude certainty under expression focus.

Of importance, the distinction between attitude formation and expression does appear to map onto the conditions under which slow and fast evaluation have been associated with greater certainty in past research. Receiving more time to judge a target's traits (Willis & Todorov, 2006) and perceiving more thoughtful processing of a message (Barden & Petty, 2008), for example, both point to judgment *formation*. On the other hand, quickly retrieving and reporting one's attitude (i.e., accessibility; Fazio, 1995) maps more closely onto judgment *expression*. Thus, evaluative focus—that is, on attitude formation versus expression—could be a crucial moderator of whether perceiving fast or slow evaluation yields greater attitude certainty.

Unfamiliar Versus Familiar Objects

Another important moderator might be whether individuals are evaluating unfamiliar or familiar objects. Consider unfamiliar objects. In general, when people evaluate novel stimuli (e.g., new issues or policies), the need for careful deliberation might be more salient, which we submit will heighten preferences for slow evaluation. In much the same way as attitude formation (vs. expression) might generally invoke greater concern with thoughtful analysis, we propose that evaluating novel or unfamiliar objects should make thoughtful deliberation more desirable. If true, slow evaluation should lead to greater certainty when people evaluate unfamiliar objects. Conversely, when people evaluate familiar objects (e.g., previously considered issues or objects), fast evaluation might generally yield greater certainty. Here, the notion is that for a familiar topic one should already know where one stands. Thus, the faster one can arrive at one's evaluation, the more certainty one can infer, because it implies that one has previously evaluated the object, and now a stored assessment can be easily retrieved.

In short, we predict an interaction such that slow evaluation will foster greater certainty when the attitude object is unfamiliar, whereas fast evaluation will foster greater certainty when the attitude object is familiar. Of course, there is a potential link between object familiarity and the formation–expression distinction noted earlier. In particular, unfamiliar objects more likely call for attitude formation because by definition they have never been encountered or evaluated. Familiar objects, on the other hand, more likely call for attitude expression because by definition they *have* been encountered and potentially evaluated (e.g., Bargh, Chaiken, Govender, & Pratto, 1992). Accordingly, the distinction between familiar and unfamiliar objects should map

onto the same expression versus formation conditions noted in prior studies and help explain seemingly disparate findings in past research.

Lay Theories

Finally, we postulate that the aforementioned moderators might ultimately stem from lay theories regarding the relative utility of gut reactions versus careful deliberation. For example, when forming an attitude or evaluating an unfamiliar object, people might tend to believe that careful, thoughtful analysis is the optimal basis for judgment (Barden & Petty, 2008; Wan et al., 2010). When expressing an attitude or evaluating a familiar object, however, people might tend to believe that quick gut reactions are more optimal or diagnostic of their true feelings (Fazio, 1995). It could be these situationally activated lay theories that would underlie the predicted interactions involving evaluative focus (formation vs. expression) and object familiarity. If true, directly tapping people's lay theories about gut reactions versus thoughtful analysis should uncover a similar interaction with PED on attitude certainty and help broaden the scope of moderators we can identify. In general, individuals who believe that thoughtful analysis is more reliable should see evaluations based on slower deliberation as more valid and, thus, feel more certain about them. Individuals who instead see gut reactions as more reliable might believe that evaluations based on quick assessments are more valid, perhaps because extensive deliberation risks leading them astray and introducing extraneous influences.

Overview

Three studies were conducted to explore these issues. In each study, participants were induced to perceive that they had evaluated an object relatively quickly or slowly. We manipulated these perceptions directly using a false feedback procedure to isolate participants' metacognitive assessments of evaluation in the absence of any actual differences. In addition, we manipulated participants' focus on attitude formation versus expression (Study 1), manipulated familiarity with the attitude object (Study 2), and measured lay theories about gut reactions versus thoughtful analysis (Study 3). We hypothesized that, in general, perceiving slow evaluation would promote certainty when participants focused on attitude formation, evaluated unfamiliar objects, or generally held the theory that thoughtful analysis was optimal. In contrast, we predicted that perceiving fast evaluation generally would promote certainty when participants focused on attitude expression, evaluated familiar objects, or generally held the theory that gut reactions were optimal. If obtained, these results would help reconcile different lines of research pointing to potentially paradoxical effects of fast versus slow evaluation on evaluative certainty.

Study 1

In Study 1 we tested the hypothesis that the effect of PED on attitude certainty would depend on whether people assessed how they formed or how they expressed their attitudes. To explore this issue, we asked all participants to think about and report their attitudes toward environmental conservation. We then provided them with false feedback that they were slower or faster than average to form or express their attitudes. We expected to find an interaction, such that participants focused on attitude formation would feel more certain when they perceived slow evaluation, whereas participants focused on attitude expression would feel more certain when they perceived fast evaluation.

Also important, we assessed the mechanism for these effects. As noted already, we reasoned that when people reflect on attitude formation, they might be especially attuned to thoughtfulness and rationality as a way of assessing their attitudes, such that slow evaluation implies more thoughtful and rational analysis, thus fostering greater certainty. When people reflect on attitude expression, however, fast evaluation might be preferable as it indicates that one has already considered and can easily retrieve one's opinion. Following this logic, we predicted that the slow-leads-to-certain effect (formation conditions) would be mediated by perceived rationality in thinking about one's attitude, whereas the fast-leads-to-certain effect (expression conditions) would be mediated by the perceived ease of expressing one's attitude.

Method

Participants and design. In partial fulfillment of a course requirement, 81 undergraduates participated. Participants were randomly assigned to conditions in a 2 (evaluative focus: formation or expression) \times 2 (PED: fast or slow) between-participants factorial design.

Procedure. Participants were seated at one of seven partitioned computer terminals. On the opening screen, they read that the purpose of the study was to develop an opinion profile of college students. As part of this research, we ostensibly were asking students about their opinions on various issues. Participants were told that they would be randomly assigned one issue. All participants then learned that the issue they had been assigned was environmental conservation. Immediately thereafter, participants were asked to consider their opinion on this issue. The instructions read, "Please think about the issue of environmental conservation until you have formed your opinion. Click 'continue' once you have formed your opinion. . . ." When participants continued to the next screen, they were prompted to report their opinions toward environmental conservation on a single scale ranging from 1 (*against*) to 9 (*in favor*). These attitude formation and expression phases were separated onto two screens to set the stage for our later evaluative focus

manipulation. Overall, participants reported favorable attitudes ($M = 7.16$, $SD = 1.47$).

After completing the attitude scale, participants were exposed to the false feedback procedure. Here, participants read that part of the opinion profile we were creating involved charting the ways students make decisions and evaluate issues. As such, the computer ostensibly had been programmed to record their time spent on different tasks (i.e., their "response latencies"). Furthermore, because they might be interested in receiving their results, the computer would give them normative feedback regarding their relative time compared to other participants in the sample. The specific nature of the instructions and subsequent feedback varied by condition to focus on attitude formation or expression. Following these instructions, a message appeared reading, "Please wait . . . the computer is processing your response latency." This message appeared for a few seconds, after which participants received bogus time feedback. Next, participants were informed that we wanted some additional information about their reactions to environmental conservation. Participants then responded to dependent measures and were debriefed. No participants reported any suspicion or awareness of our hypotheses.

Independent Variables

Evaluative focus. Participants were randomly assigned to attitude formation or expression conditions. In the *formation condition*, the prefeedback instructions indicated that we were interested in the amount of time it took participants to form their opinions, or determine where they stood, on some issues compared to others. Similarly, subsequent feedback in this condition referenced the amount of time it took participants to form their opinion before continuing to the response scale. In the *expression condition*, the instructions indicated that we were interested in the amount of time it took participants to express, or report, their opinions on some issues compared to others. Subsequent feedback in this condition referenced the amount of time it took participants to express their opinions on the scale provided.

Perceived evaluation duration. Participants were randomly assigned to perceived fast or slow evaluation conditions. As noted, this manipulation took the form of false feedback. In the *fast condition*, participants received feedback that they took less time than most other participants to form or express their attitudes. In the *slow condition*, participants received feedback that they took more time than most other participants to form or express their attitudes. In neither condition was any specific information about time provided; feedback simply indicated whether more or less time had been taken.

This approach had several advantages. For example, couching the feedback in relative terms allowed us to induce the desired perception regardless of how fast or slow participants actually were in evaluating. It also allowed us to

capitalize on people's well-established tendency to form inferences about themselves on the basis of social comparisons (e.g., Festinger, 1954). Of importance, though, pretesting indicated that this manipulation did not affect mood or create differential perceptions of success or failure on the task; it merely influenced PED. Furthermore, because feedback followed the evaluation period, there was no effect of the manipulation on the actual time spent forming or expressing attitudes, $F_s < 1$.

Dependent Measures

Attitude certainty. Because our central focus was on attitude certainty, we assessed certainty immediately following the false feedback. In particular, participants responded to two attitude certainty questions adapted from past research (Petrocelli et al., 2007): (a) "How certain are you that you know what your true attitude toward environmental conservation really is?" and (b) "How certain are you that your attitude toward environmental conservation is the correct attitude to have?" Each question was accompanied by a scale ranging from 1 (*not certain at all*) to 9 (*very certain*). Responses to were significantly correlated ($r = .67$, $p < .001$) and, thus, averaged to form a composite index.

Potential mediators. Following the certainty items, we assessed potential mediators of the PED effects. First, we assessed *perceived rationality* by asking participants to indicate how rational they had been in thinking about their attitude toward environmental conservation. Responses were provided on a scale ranging from 1 (*not rational at all*) to 9 (*very rational*). Following this item, we assessed *perceived ease*. Here participants indicated how easy it was for them to express their opinion, using a scale ranging from 1 (*not easy at all*) to 9 (*very easy*).

Results

Attitude certainty. We began our analysis by submitting the attitude certainty data to a 2×2 ANOVA with evaluative focus and PED as the independent variables. First, we found an unexpected main effect for evaluative focus, $F(1, 77) = 4.95$, $p < .05$; participants felt more certain of their attitudes in the formation ($M = 6.76$, $SD = 1.49$) rather than the expression ($M = 5.96$, $SD = 1.82$) condition. There was no main effect for PED, $F < 1$. Most important, we obtained the predicted interaction, $F(1, 77) = 12.31$, $p < .001$. As illustrated in Table 1, when participants were focused on attitude formation, they felt more certain of their attitudes in the slow rather than fast condition, $F(1, 77) = 4.77$, $p < .04$. When participants were focused on attitude expression, they felt more certain in the fast rather than slow condition, $F(1, 77) = 7.63$, $p < .01$.

Potential mediators. Next, we submitted the potential mediators to separate analyses. On the *perceived rationality*

Table 1. Attitude Certainty, Perceived Rationality, and Perceived Ease as a Function of Evaluative Focus and Perceived Evaluation Duration in Study 1

Dependent measure	Formation focus		Expression focus	
	Perceived evaluation duration			
	Fast	Slow	Fast	Slow
Attitude certainty				
M	6.25	7.29	6.69	5.30
SE	0.33	0.34	0.37	0.35
Perceived rationality				
M	5.96	7.29	6.17	5.80
SE	0.36	0.37	0.40	0.38
Perceived ease				
M	7.41	6.86	7.78	5.55
SE	0.41	0.42	0.45	0.43

index, we found a marginal main effect for evaluative focus, $F(1, 77) = 2.80, p < .10$, suggesting greater perceived rationality in the formation ($M = 6.60, SD = 1.71$) rather than the expression ($M = 5.97, SD = 1.82$) condition. There was no main effect for PED, $F(1, 77) = 1.60, p > .20$. Of greatest import, we found a significant interaction, $F(1, 77) = 4.97, p < .03$. As shown in Table 1, when participants focused on attitude formation, they reported that they had been more rational in thinking about their attitudes in the slow compared to fast condition, $F(1, 77) = 6.52, p < .02$. When participants focused on attitude expression, there was no effect of PED on perceived rationality, $F < 1$.

On the *perceived ease* index, the results differed. In this case, there was no main effect for evaluative focus, $F(1, 77) = 1.23, p > .27$, but there was a main effect for PED, $F(1, 77) = 10.78, p < .01$. Participants generally reported greater ease of expression when they received fast ($M = 7.58, SD = 1.77$) compared to slow ($M = 6.22, SD = 2.09$) feedback. However, this main effect was qualified by an interaction, $F(1, 77) = 3.92, p = .05$. As displayed in Table 1, when participants focused on attitude expression, they reported greater ease following fast compared to slow feedback, $F(1, 77) = 13.03, p < .001$. When participants focused on attitude formation, the feedback had no impact, $F < 1$.

Mediation. Based on the results for the perceived rationality and perceived ease data, perceived rationality was a plausible mediator of the certainty effect under formation but not expression conditions. Conversely, perceived ease was a plausible mediator of the certainty effect under expression but not formation conditions. Thus, we conducted two separate tests of moderated mediation (see Muller, Judd, & Yzerbyt, 2005), one for perceived rationality and one for perceived ease.

Focusing first on perceived rationality, we found significant interactions between PED and evaluative focus on both attitude certainty and the mediator, as noted. Furthermore,

perceived rationality predicted certainty, $\beta = .75, t(79) = 10.20, p < .001$. In a simultaneous regression treating the interaction, perceived rationality, and the PED and evaluative focus main effect terms as predictors of attitude certainty, both perceived rationality, $\beta = .71, t(76) = 9.64, p < .001$, and the interaction, $\beta = -.33, t(76) = -2.66, p < .01$, remained significant. Most important, bootstrapping procedures computing a confidence interval around the indirect effect revealed a significant mediating pathway from the interaction to attitude certainty through perceived rationality (95% CI = -2.26 to -0.17 ; see Preacher, Rucker, & Hayes, 2007).

Shifting our focus to perceived ease, we also found a significant interaction on this mediator. Moreover, perceived ease predicted attitude certainty, $\beta = .62, t(79) = 7.03, p < .001$. In a simultaneous regression treating perceived ease, the interaction, and the PED and evaluative focus main effect terms as predictors, both perceived ease, $\beta = .61, t(76) = 6.78, p < .001$, and the interaction, $\beta = -.41, t(76) = -2.82, p < .01$, were significant. Here, too, bootstrapping procedures revealed a significant mediating pathway (95% CI = -1.77 to -0.03).

To further illustrate differential mediation of the attitude certainty effect under formation and expression conditions, we followed the above results by conducting separate mediation analyses within each condition. In the formation condition (Figure 1, top panel), we found a significant effect of PED on perceived rationality and attitude certainty, as already noted. When both PED and perceived rationality were entered as predictors of certainty, perceived rationality continued to be a significant predictor, $\beta = .78, t(40) = 7.59, p < .001$, whereas PED did not, $\beta = .04, t(40) = 0.42, p = .68$, and the mediating pathway through perceived rationality was significant (95% CI = 0.36 to 1.74). In the expression condition (Figure 1, bottom panel), there was a significant effect of PED on perceived ease and attitude certainty. When PED and perceived ease were both entered as predictors of certainty, perceived ease remained a significant predictor, $\beta = .84, t(35) = 7.69, p < .001$, but PED did not, $\beta = .03, t(35) = 0.30, p > .76$, and the mediating pathway through ease was significant (95% CI = -2.66 to -0.61).

Discussion

Study 1 provided evidence for the hypothesis that PED has a dynamic effect on attitude certainty. Our results suggest that perceived slow evaluation promotes certainty when people are forming their attitudes (or assessing how they formed them), whereas perceived fast evaluation promotes certainty when people are expressing their attitudes (or assessing how they expressed them). When the focus is on formation, perceiving slow evaluation appears to produce greater certainty because it heightens perceptions of rational thought underlying the attitude. When the focus is on expression, perceiving fast evaluation promotes greater certainty because in this context fast evaluation induces the perception of greater ease

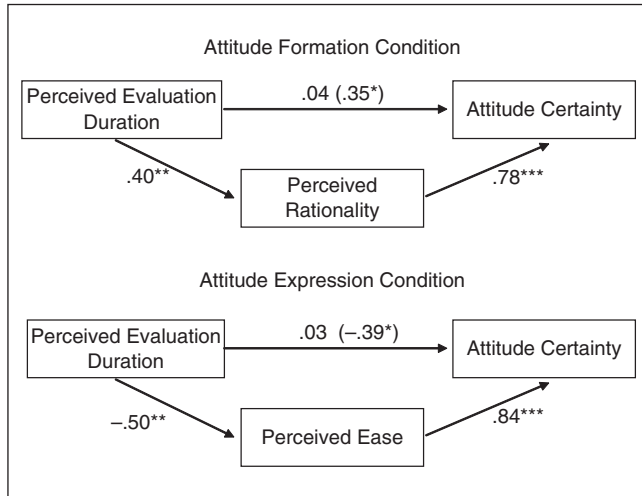


Figure 1. Mediation pathways for the attitude formation (top panel) and attitude expression (bottom panel) conditions in Study 1. Values in parentheses indicate the direct effect of perceived evaluation duration on attitude certainty before controlling for the mediator.

* $p < .05$. ** $p < .01$. *** $p < .001$.

of retrieving and reporting one's attitude. As noted earlier, this finding has both theoretical and practical relevance. Indeed, the formation–expression distinction seems especially important today with the advent of online resources and social networking websites that induce people to both form and express opinions with increasing frequency.

As a caveat, we acknowledge that our manipulation of evaluative focus in Study 1—that is, formation versus expression—was rather explicit. This feature of our design was intended to provide an unambiguous test of our hypothesis that people might form different inferences depending on whether they are reflecting on how long they took to form or how long they took to express their attitudes. Our aim was to clearly delineate the differential impact of perceiving fast versus slow evaluation when individuals assess versus express their opinions. Nevertheless, it is important to test the effect of PED using a manipulation that might parallel the distinction between attitude formation and expression more naturally in the real world. In Study 2, we explored the role of object familiarity.

Study 2

As outlined earlier, the core distinction between attitude formation and expression conceptually parallels the distinction between evaluating unfamiliar and familiar objects, respectively. Indeed, retrieving and expressing an attitude suggests that one has already encountered and evaluated the object, thus implying at least moderate familiarity with it. Sharing one's opinion of a restaurant, for example, suggests that one has been to the restaurant and has at least some knowledge about it. By contrast, forming an attitude suggests that the object

has at least some degree of novelty or unfamiliarity as it has yet to be fully evaluated. If true, the effect of PED under familiar (unfamiliar) object conditions should resemble the effect under attitude expression (formation) conditions. Accordingly, Study 2 tested the hypothesis that PED interacts with object familiarity to affect attitude certainty.

This interaction would be noteworthy in multiple ways. For example, an extensive body of research highlights familiarity as an important metacognitive experience that can affect people's attitudes and assessments of information validity (e.g., Begg et al., 1992; Moons, Mackie, and Garcia-Marques, 2009). The predicted interaction would suggest that familiarity can also moderate people's perceptions of their own evaluative processes, such that opposing factors (i.e., fast or slow evaluation) seem to warrant greater certainty when the evaluated object is familiar or unfamiliar. Moreover, as noted, although the focus on formation versus expression in Study 1 is useful as a first step in understanding the opposing effects of PED, object familiarity might be a variable that people appraise more readily when they evaluate objects in their daily lives. Thus, manipulating familiarity offers an important test of the current effects.

To explore these issues, we asked participants to evaluate an abstract painting that, by random assignment, they either had (familiar) or had not (unfamiliar) seen before. We then provided them with false feedback that they evaluated it quickly or slowly. We predicted that participants would feel more certain of their attitudes when they perceived slow rather than fast evaluation of an unfamiliar painting but fast rather than slow evaluation of a familiar painting.

Method

Participants and design. In partial fulfillment of a course requirement, 80 undergraduates participated. Participants were randomly assigned to conditions in a 2 (familiarity: familiar or unfamiliar) \times 2 (PED: fast or slow) between-participants factorial design.

Procedure. Participants were recruited for an ostensible memory study. When they arrived, they were seated at one of several partitioned computer terminals, where they were instructed that they would be presented with a series of abstract paintings. Their task was to study the paintings for a memory test. Following these instructions, participants viewed 12 abstract paintings, one at a time. All participants saw the same series of paintings with the exception of one painting in the ninth position that set the stage for the familiarity manipulation. Each painting appeared on the screen for 10 seconds, at which time the computer advanced to the next painting. At the end of this task, participants read that they would now see a single painting that we would like them to evaluate. Participants were told to click "continue" when they were ready to proceed, at which time they examined the target painting. When participants were done viewing the

painting, they again clicked “continue” and were prompted to report their attitudes toward the painting on a single scale ranging from 1 (*unfavorable*) to 9 (*favorable*). After reporting attitudes, which hovered near the midpoint of the scale ($M = 4.53$, $SD = 1.84$), participants received false feedback about their evaluation duration, completed dependent measures, and were debriefed.

Independent Variables

Familiarity. Participants were randomly assigned to evaluate a familiar or unfamiliar painting. In the *familiar condition*, participants were asked to evaluate a painting that was in the original set of 12. In the *unfamiliar condition*, the painting was not included in the original set. Of importance, though, all participants evaluated the exact same painting. In the familiar condition it also had appeared earlier in the ninth slot, whereas in the unfamiliar condition a different painting had been included in the ninth slot.

Perceived evaluation duration. Using a false feedback manipulation that closely paralleled the one used in Study 1, participants were led to believe that they had taken more or less time than most other participants in our sample to evaluate the target painting.

Dependent Measures

Attitude certainty. Following the feedback, participants were told that we wanted to get additional reactions to the painting. Then, participants were asked three questions assessing attitude certainty (adapted from past research; see Tormala & Rucker, 2007): “How convinced are you of your opinion of the painting?” “How much confidence do you have in your attitude toward the painting?” and “How certain are you that of all possible attitudes one might have toward the painting, yours reflects the right way to think and feel about it?” Responses, given on scales ranging from 1 (*not convinced at all, no confidence at all, not certain at all*) to 9 (*extremely convinced, very high confidence, very certain*), were averaged ($\alpha = .74$).

Perceived familiarity. Finally, as a manipulation check, participants completed a single item assessing perceived familiarity: “When you saw the painting, how familiar were you with it?” Responses were provided on a scale ranging from 1 (*not familiar at all*) to 9 (*very familiar*).

Results

Perceived familiarity. We began our analysis by submitting familiarity ratings to a 2×2 ANOVA with familiarity and PED as independent variables. As expected, there was a significant effect for the familiarity manipulation, $F(1, 76) = 8.12$, $p < .007$, such that participants reported greater familiarity in the familiar ($M = 3.55$, $SD = 2.60$) rather than

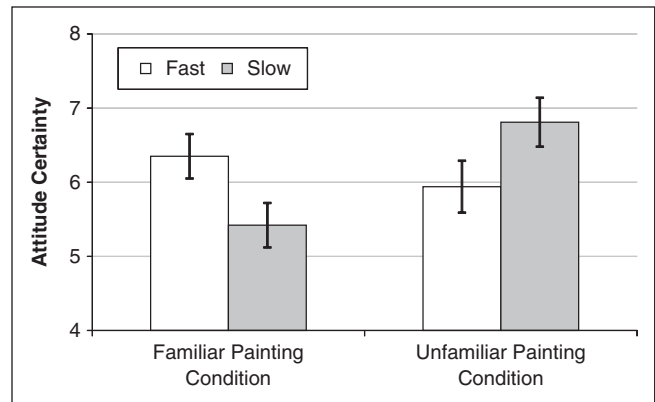


Figure 2. Attitude certainty as a function of object familiarity and perceived evaluation duration in Study 2. Error bars represent standard errors.

unfamiliar ($M = 2.06$, $SD = 1.80$) condition. There were no other effects on this item, $ps > .29$.

Attitude certainty. Next, the certainty index was submitted to analysis. This analysis revealed no main effects for PED, $F < 1$, or familiarity, $F(1, 76) = 2.31$, $p > .13$. However, we obtained the predicted interaction, $F(1, 76) = 7.77$, $p < .01$. As illustrated in Figure 2, when participants evaluated a familiar painting, they were more certain of their attitudes in the fast rather than slow condition, $F(1, 76) = 4.61$, $p < .04$. In contrast, when participants evaluated an unfamiliar painting, they tended to be more certain of their attitudes in the slow rather than fast condition, $F(1, 76) = 3.30$, $p < .08$.

Discussion

Study 2 further established the dynamic nature of PED effects. When participants evaluated a painting to which they had been previously exposed (familiar condition), they were more certain of their attitudes when they perceived fast rather than slow evaluation. When participants evaluated a painting to which they had not been exposed (unfamiliar condition), this effect was reversed. It is noteworthy that this interaction emerged despite relatively low responses to the manipulation check across conditions. Generally low familiarity ratings might indicate that our subtle manipulation of familiarity using a single prior exposure was insufficient to instill the subjective sense of intimacy needed to push familiarity ratings above the midpoint of the scale. Nevertheless, this single exposure was sufficient to create a difference in self-reported familiarity and, more importantly, a difference in the direction of the certainty effect. In uncovering this pattern of effects, Study 2 broadens our view of the role of familiarity as a moderator of people’s appraisals of their own attitudes. It also highlights a naturally occurring variable—that is, prior exposure—that shapes the impact of PED on attitude certainty.

Study 3

To this point, our findings converge on the notion that situational factors moderate whether individuals become more certain of their attitudes following perceived fast or slow evaluation. Perceiving fast evaluation generally appears to foster certainty when people are focused on attitude expression or familiar objects, whereas perceiving slow evaluation fosters certainty when people are focused on attitude formation or unfamiliar objects. As outlined earlier, we submit that these effects might jointly derive from situationally activated lay theories about what types of judgments, or evaluative processes, are more valid or trustworthy. When an object is novel or an individual is forming an opinion, the salient theory might generally be that slow evaluation is optimal because it allows for more careful deliberation. When an object has been previously encountered or an individual is expressing an attitude (e.g., sharing an opinion online or telling a friend about it), the salient theory might differ and suggest that quick gut reactions should be trusted because they reflect easy retrieval of a prior evaluation already made.

If the results of Studies 1 and 2 depend on situationally derived theories about thoughtful analyses versus gut reactions—that is, which is optimal under which conditions—directly measuring people’s general beliefs about which are generally more optimal should produce similar effects. In Study 3, we measured lay theories concerning the utility of gut reactions versus thoughtful analyses as a basis for judgment. We then treated this variable as an individual difference moderator of the PED effect. We predicted that people believing thoughtful judgments are more trustworthy would show greater certainty following perceived slow evaluation, whereas people believing gut reactions are more trustworthy would show greater certainty following perceived fast evaluation.

Method

Participants and design. In partial fulfillment of a course requirement, 77 undergraduates participated. Participants were randomly assigned to fast or slow PED conditions and reported their theories about thoughtful judgments versus gut reactions in an ostensible second study.

Procedure. Participants were seated at partitioned computer terminals and instructed that we were assessing reactions to a new policy being considered at their university. All participants were led to believe that administrators were considering a mandatory ID policy that would require students to swipe ID cards before entering any campus building. Participants were told that, as with any policy change, there were pros and cons to this system; for example, it would enhance security but be expensive to implement. Then, participants were prompted to consider and report their attitudes

toward the ID policy on separate screens using the same procedure as in the earlier studies. On average, participants reported unfavorable attitudes ($M = 3.66$, $SD = 2.11$). After doing so, participants received false feedback indicating that they had evaluated quickly or slowly, after which they reported attitude certainty, engaged in a 15-minute filler task, and responded to an ostensible personality inventory in a second study with numerous items in which a single measure of lay theories was embedded.

Independent Variables

Perceived evaluation duration. Participants were led to believe that they had evaluated quickly or slowly using the same procedure as in Study 2.

Lay theory. We embedded one item in the personality inventory asking participants what they generally trusted more when making decisions—their gut reactions or their more thoughtful judgments. The response scale was from 1 (*gut reaction*) to 9 (*thoughtful judgment*).

Attitude Certainty Measure

We assessed attitude certainty using three items adapted from past research (see Tormala & Rucker, 2007): “How much confidence do you have in your attitude toward the identification card policy?” “How easily could your opinion on this issue be changed?” and “How certain are you that of all possible attitudes one might have toward the identification card policy, your attitude reflects the right way to think and feel about it?” Responses, given on scales ranging from 1 (*no confidence at all, extremely easily, not certain at all*) to 9 (*very high confidence, not easily at all, very certain*), were averaged to form a composite index ($\alpha = .76$).

Results

We submitted the attitude certainty index to a hierarchical regression in which PED (dummy coded: 0 = *fast*, 1 = *slow*) and lay theory (continuous; mean-centered) were entered as predictors in the first step and their interaction was entered in a second step. Neither main effect was reliable (β s < $|.20|$, $ps > .12$). As illustrated in Figure 3, however, there was a significant interaction between lay theory and PED, $\beta = .58$, $t(73) = 3.08$, $p < .004$. Participants who believed that gut reactions were more trustworthy (analyzed at $-1 SD$ on the lay theory index) showed greater certainty in the fast rather than slow condition, $\beta = -.38$, $t(73) = -2.32$, $p < .03$. In contrast, participants who believed that thoughtful judgments were more trustworthy (analyzed at $+1 SD$ on the lay theory index) showed greater certainty in the slow rather than fast condition, $\beta = .35$, $t(73) = 2.06$, $p < .05$.

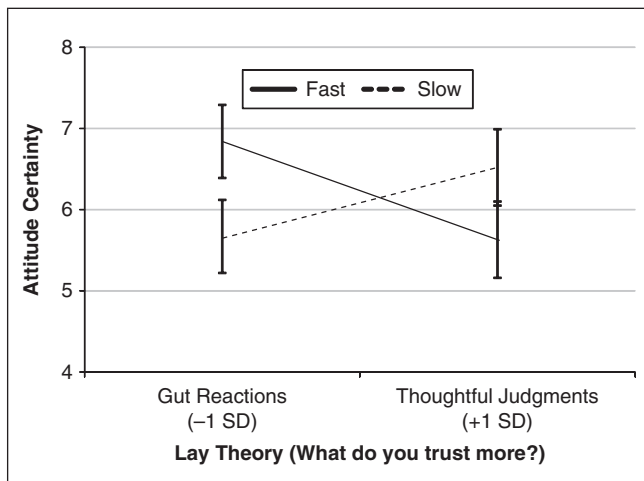


Figure 3. Attitude certainty as a function of lay theory and perceived evaluation duration in Study 3
Error bars represent standard errors.

Discussion

Study 3 revealed that lay theories moderated the effect of PED on attitude certainty. As hypothesized, individuals who generally believed that gut reactions were more trustworthy showed greater certainty following perceived fast evaluation, whereas individuals who generally believed that thoughtful judgments were more trustworthy showed greater certainty following perceived slow evaluation. Although we did not directly test the role of lay theories in Studies 1 and 2, this result hints at the possibility that situationally activated lay theories were the underlying force driving the interaction effects in those experiments. Indeed, our collective evidence is consistent with the view that attitude formation versus expression, like evaluating unfamiliar versus familiar objects, situationally activates a different belief about the importance of taking time to deliberate versus simply going with the gut. This belief, in turn, shapes certainty. As a caveat, however, we note that our primary aim in Study 3 was not to conclusively link Studies 1 and 2 to lay theories but rather to broaden the scope of PED effects. Indeed, by testing an individual difference moderator, Study 3 demonstrated a new implication of PED effects that can be derived from the first two studies.

General Discussion

Charting the origins of certainty is both theoretically and practically important. Understanding what makes people more or less certain of their attitudes, for example, gives deeper insight into metacognitive factors guiding attitude maintenance and change and offers a crucial lever for predicting and shaping people's attitudes, choices, and behaviors. Our aim in the current studies was to explore the impact of

perceiving that one has evaluated something quickly or slowly. As reviewed earlier, related findings from past research directly and indirectly point to divergent, even paradoxical, effects in this domain. Some evidence suggests that fast evaluation should promote certainty, whereas other evidence suggests that slow evaluation should promote certainty. Our research attempts to help integrate these diverse findings by manipulating subjective perceptions of fast or slow evaluation and proposing a set of moderators and mediators to capture the link between these perceptions and certainty.

In three studies, we varied participants' perceived evaluative speed. In addition, Study 1 manipulated participants' reflection on attitude formation versus expression, Study 2 manipulated familiarity with the attitude object, and Study 3 measured lay theories that gut reactions or thoughtful responses were more trustworthy. Furthermore, across studies we used different attitude objects and issues and, in so doing, explored the current effects in the context of favorable, unfavorable, and neutral attitudes. Results indicated that when people reflected on attitude expression, evaluated familiar objects, or generally trusted gut reactions, perceiving fast evaluation promoted greater certainty. In contrast, when people reflected on attitude formation, evaluated unfamiliar objects, or generally trusted thoughtful responses, perceiving slow evaluation promoted greater certainty. Study 1 further revealed that these effects stemmed from trade-offs between perceived rational analysis and perceived ease of attitude retrieval.

Interestingly, flexibility in PED effects resonates with other research suggesting that metacognitive influences tend to be somewhat dynamic. For instance, Briñol, Petty, and Tormala (2006) found that although processing fluency had been assumed to be an inherently positive feeling with positive effects, the effect is in fact malleable, varying according to people's naïve theories about the meaning of fluency. Specifically, Briñol et al. showed that the ease with which information could be processed produced favorable or unfavorable attitudes depending on manipulated beliefs that ease is a positive or negative indicator of mental functioning. Although the Briñol et al. studies focused on the feeling of fluency and how it affects attitudes—rather than the perception of fast versus slow evaluation and how that affects certainty—the theme of flexible metacognitive inferences is consistent with the current findings. In addition to deepening our insight into the origins of certainty, then, the current research might contribute to the fluency literature by identifying new variables such as fast/slow evaluation and attitude formation/expression that can shape perceptions of fluent versus disfluent processing.

Of course, as is true of other metacognitive inferences, the current effects might change when people's attributions for fast or slow evaluation change. In our studies, it appears that participants made internal attributions, using PED to infer how certain they should be. What happens when people make external (situational) attributions for fast

or slow evaluation? As but one example, perhaps loud or intrusive background noise, or some other distraction, leads people to attribute slow evaluation to the situation, preempting any inferences about certainty. Future research exploring the role of internal versus external attributions in the current context would be useful. Also useful would be studies exploring more established individual difference moderators of the preference for thoughtful analysis versus gut reactions (e.g., need for cognition—Cacioppo & Petty, 1982; faith in intuition—Epstein, Pacini, Denes-Raj, & Heier, 1996). In general, metacognitive inferences like those examined here tend to be more prominent when people process deeply (e.g., Tormala et al., 2002; also see Kühnen, 2010). Yet the current studies reveal contexts and people in which there seems to be a preference for quick evaluation, which would seem to align with less thoughtful analysis. Future studies digging deeper into this potential tension could expand our understanding of the factors driving preferences for, and reflection on, fast or slow evaluation.

We also think it would be useful to examine contexts in which the current effects occur more spontaneously. For example, our manipulation of PED in the present research was relatively blatant or heavy handed, relying on feedback about how quickly or slowly participants evaluated compared to others. Our central aim in this initial research was to unambiguously manipulate PED to discern its impact on attitude certainty, but identifying more naturalistic sources remains important. Perhaps in the real world people base PED on time pressure, the feeling of being rushed or hurried, spontaneous decision-time comparisons with peers, or some other factor. Charting these influences on PED is an important direction for future research.

Similarly, having established that PED effects can vary based on personal or situational preferences for fast or slow evaluation, it is important to investigate the contexts, decisions, or objects that spontaneously evoke one preference or the other. For instance, perhaps when individuals make complex or high-stakes decisions (e.g., purchasing a new car) or choose between multiple competing and similarly attractive items, they have a preference for slow evaluation as a marker of due diligence. If true, they might feel more certain when they evaluate slowly. On the contrary, when individuals make simple, easy, or low-stakes decisions (e.g., selecting a menu item for lunch), they might favor fast evaluation as an indicator of gut preference and thus feel more certain when they evaluate quickly. Answering these questions would be a useful next step in this domain.

Broader Questions

Goal Pursuit

Going forward, we think the current findings have relevance to a number of other areas of research. For instance, the

distinction between forming and expressing a preference plays a central role in theories of self-regulation, most notably Gollwitzer's model of action phases (Gollwitzer & Bayer, 1999). This model distinguishes between the deliberation phase of goal pursuit, when individuals must arrive at an opinion about which of their many desires they want to commit to as a goal, and the implementation phase of goal pursuit, when individuals plan the expression and execution of their commitment. It could be that more time facilitates deliberation because it allows a fuller consideration of potential goals, whereas it undermines implementation because it induces second guessing. Assuming greater certainty translates into more self-regulatory success, the current research suggests that PED might play an important role in goal pursuit.

Informational Preferences

Another question sparked by the current research is the extent to which lay theories reflect informational preferences. That is, do people who trust gut reactions rather than thoughtful deliberation also prefer to evaluate different information? More generally, does trusting fast evaluation lead people to attend to or seek out different information than trusting slow evaluation? For instance, when people receive ads promoting new products, do those preferring slow evaluation also focus on information that takes longer to evaluate—such as substantive arguments rather than celebrity endorsements—or do they simply spend more time assessing whatever information is available? Lay theories about fast and slow evaluation need not map onto informational preferences (e.g., someone could think, "I prefer quick decisions yet I still think it's important to consider the core merits of something"), but informational preferences have been shown to shape people's feelings about their attitudes (Tormala & DeSensi, 2008). Thus, informational preferences might provide an additional metacognitive layer as we delve deeper into the dynamic effects of PED.

Intuition and Perceived Rationality

Finally, our studies raise questions with respect to how people assess their own intuition and rationality. At first blush, it seems reasonable to surmise that people generally believe that slow, thoughtful judgments are better than fast, gut reactions. However, our research suggests that people can see slow or fast judgments as more valid, depending on a host of factors. This finding fits with recent theorizing about intuitive judgment. For example, work on intuitive confidence (Simmons & Nelson, 2006) reveals that gut reactions can be held with confidence precisely because they come to mind easily. Similarly, although unconscious-thought theory (UTT; Dijksterhuis & Nordgren, 2006) does not explore the origins of certainty, it does suggest that intuition can provide a reliable basis for judgment when it reflects a gut reaction

stemming from previous unconscious thought. In other words, UTT suggests that gut reactions do not inevitably reflect snap judgments but rather can arise from extended thinking that occurs below consciousness. Consequently, UTT postulates that gut reactions can offer effective insights.

Our studies do not speak to the issue of conscious versus unconscious processing or to the question of accurate versus inaccurate judgment. Nevertheless, they do suggest that some people in some situations believe that relying on gut reactions can be an effective means of evaluation. In future studies, it is worth examining whether this belief might stem from the subjective perception that gut reactions can reflect unconscious assessments that accurately tap one's true thoughts, needs, and preferences. For now, our studies suggest that neither the special credence afforded to slow evaluation nor the special weighting of fast (intuitive) evaluation is the default. Different situations and different people appear to invoke one preference or the other. Exploring malleable perceptions of intuition and rationality, and the implications for judgment certainty, remains an important direction for future research.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

Financial Disclosure/Funding

The authors received no financial support for the research and/or authorship of this article.

References

- Alter, A. L., & Oppenheimer, D. M. (2009). Uniting the tribes of fluency to form a metacognitive nation. *Personality and Social Psychology Review, 13*, 219-235.
- Barden, J., & Petty, R. E. (2008). The mere perception of elaboration creates attitude certainty: Exploring the thoughtfulness heuristic. *Journal of Personality and Social Psychology, 95*, 489-509.
- Bargh, J. A., Chaiken, S., Govender, R., & Pratto, F. (1992). The generality of the automatic attitude activation effect. *Journal of Personality and Social Psychology, 62*, 893-912.
- Bassili, J. N. (1996). Meta-judgmental versus operative indexes of psychological attributes: The case of measures of attitude strength. *Journal of Personality and Social Psychology, 71*, 637-653.
- Begg, I. M., Anas, A., & Farinacci, S. (1992). Dissociation of processes in belief: Source recollection, statement familiarity, and the illusion of truth. *Journal of Experimental Psychology: General, 121*, 446-458.
- Bizer, G. Y., Tormala, Z. L., Rucker, D. D., & Petty, R. E. (2006). Memory-based versus on-line processing. Implications for attitude strength. *Journal of Experimental Social Psychology, 42*, 646-653.
- Briñol, P., Petty, R. E., & Barden, J. (2007). Happiness versus sadness as a determinant of thought confidence in persuasion: A self-validation analysis. *Journal of Personality and Social Psychology, 93*, 711-727.
- Briñol, P., Petty, R. E., & Tormala, Z. L. (2006). The malleable meaning of subjective ease. *Psychological Science, 17*, 200-206.
- Briñol, P., Petty, R. E., Valle, C., Rucker, D. D., & Becerra, A. (2007). The effects of message recipients' power before and after persuasion: A self-validation analysis. *Journal of Personality and Social Psychology, 93*, 1040-1053.
- Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology, 42*, 116-131.
- Clarkson, J. J., Tormala, Z. L., DeSensi, V. D., & Wheeler, S. C. (2009). Does attitude certainty beget self-certainty? *Journal of Experimental Social Psychology, 45*, 436-439.
- Clarkson, J. J., Tormala, Z. L., & Rucker, D. D. (2008). A new look at the consequences of attitude certainty: The amplification hypothesis. *Journal of Personality and Social Psychology, 95*, 810-825.
- Dijksterhuis, A., & Nordgren, L. F. (2006). A theory of unconscious thought. *Perspectives on Psychological Science, 1*, 95-109.
- Epstein, S., Pacini, R., Denes-Raj, V., & Heier, H. (1996). Individual differences in intuitive-experiential and analytical-rational thinking styles. *Journal of Personality and Social Psychology, 71*, 390-405.
- Fazio, R. H. (1995). Attitudes as object-evaluation associations: Determinants, consequences, and correlates of attitude accessibility. In R. E. Petty & J. A. Krosnick (Eds.), *Attitude strength: Antecedents and consequences* (pp. 93-130). Mahwah, NJ: Lawrence Erlbaum.
- Fazio, R. H., & Zanna, M. P. (1978). Attitudinal qualities relating to the strength of the attitude-behavior relationship. *Journal of Experimental Social Psychology, 14*, 398-408.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7*, 117-140.
- Gill, M. J., Swann, W. B., & Silvera, D. H. (1998). On the genesis of confidence. *Journal of Personality and Social Psychology, 75*, 1101-1114.
- Gollwitzer, P. M., & Bayer, U. (1999). Deliberative versus implemental mindsets in the control of action. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 403-422). New York, NY: Guilford.
- Gross, S., Holtz, R., & Miller, N. (1995). Attitude certainty. In R. E. Petty & J. A. Krosnick (Eds.), *Attitude strength: Antecedents and consequences* (pp. 215-245). Mahwah, NJ: Lawrence Erlbaum.
- Haddock, G., Rothman, A. J., Reber, R., & Schwarz, N. (1999). Forming judgments of attitude certainty, intensity, and importance: The role of subjective experience. *Personality and Social Psychology Bulletin, 25*, 771-782.
- Henderson, M. D., de Liver, Y., & Gollwitzer, P. M. (2008). The effects of an implemental mind-set on attitude strength. *Journal of Personality and Social Psychology, 94*, 396-411.
- Holland, R. W., Verplanken, B., & van Knippenberg, A. (2003). From repetition to conviction: Attitude accessibility as a determinant of attitude certainty. *Journal of Experimental Social Psychology, 39*, 594-601.
- Kelley, C. M., & Lindsay, D. S. (1993). Remembering mistaken for knowing: Ease of retrieval as a basis for confidence in answers to general knowledge questions. *Journal of Memory and Language, 32*, 1-24.

- Kühnen, U. (2010). Manipulation checks as manipulation: Another look at the ease-of-retrieval heuristic. *Personality and Social Psychology Bulletin*, *36*, 47-58.
- Liberman, N., & Förster, J. (2006). Inferences from decision difficulty. *Journal of Experimental Social Psychology*, *42*, 290-301.
- Moons, W. G., Mackie, D. M., & Garcia-Marques, T. (2009). The impact of repetition-induced familiarity on agreement with weak and strong arguments. *Journal of Personality and Social Psychology*, *96*, 32-44.
- Muller, D., Judd, C. M., & Yzerbyt, V. Y. (2005). When moderation is mediated and mediation is moderated. *Journal of Personality and Social Psychology*, *89*, 852-863.
- Petrocelli, J. V., Tormala, Z. L., & Rucker, D. D. (2007). Unpacking attitude certainty: Attitude clarity and attitude correctness. *Journal of Personality and Social Psychology*, *92*, 30-41.
- Petty, R. E., Briñol, P., Tormala, Z. L., & Wegener, D. T. (2007). The role of metacognition in social judgment. In A. W. Kruglanski & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles* (2nd ed., pp. 254-284). New York, NY: Guilford.
- Pomerantz, E. M., Chaiken, S., & Tordesillas, R. S. (1995). Attitude strength and resistance processes. *Journal of Personality and Social Psychology*, *69*, 408-419.
- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research*, *42*, 185-227.
- Pronin, E., & Jacobs, E. (2008). Thought speed, mood, and the experience of mental motion. *Perspectives on Psychological Science*, *3*, 461-485.
- Rucker, D. D., Petty, R. E., & Briñol, P. (2008). What's in a frame anyway? A meta-cognitive analysis of the impact of one versus two sided message framing on attitude certainty. *Journal of Consumer Psychology*, *18*, 137-149.
- Sackett, A. M., Meyvis, T., Nelson, L. D., Converse, B. A., & Sackett, A. L. (2010). You're having fun when time flies: The hedonic consequences of subjective time progression. *Psychological Science*, *21*, 111-117.
- Simmons, J. P., & Nelson, L. D. (2006). Intuitive confidence: Choosing between intuitive and nonintuitive alternatives. *Journal of Experimental Psychology: General*, *135*, 409-428.
- Smith, S. M., Fabrigar, L. R., MacDougall, B. L., & Wiesenhal, N. L. (2008). The role of amount, cognitive elaboration, and structural consistency of attitude-relevant knowledge in the formation of attitude certainty. *European Journal of Social Psychology*, *38*, 280-295.
- Tiedens, L. Z., & Linton, S. (2001). Judgment under emotional certainty and uncertainty: The effects of specific emotions on information processing. *Journal of Personality and Social Psychology*, *81*, 973-988.
- Tormala, Z. L., Clarkson, J. J., & Petty, R. E. (2006). Resisting persuasion by the skin of one's teeth: The hidden success of resisted persuasive messages. *Journal of Personality and Social Psychology*, *91*, 423-435.
- Tormala, Z. L., & DeSensi, V. D. (2008). The perceived informational basis of attitudes: Implications for subjective ambivalence. *Personality and Social Psychology Bulletin*, *34*, 275-287.
- Tormala, Z. L., Petty, R. E., & Briñol, P. (2002). Ease of retrieval effects in persuasion: A self-validation analysis. *Personality and Social Psychology Bulletin*, *28*, 1700-1712.
- Tormala, Z. L., & Rucker, D. D. (2007). Attitude certainty: A review of past findings and emerging perspectives. *Social and Personality Psychology Compass*, *1*, 469-492.
- Visser, P. S., & Mirabile, R. R. (2004). Attitudes in the social context: The impact of social network composition on individual-level attitude strength. *Journal of Personality and Social Psychology*, *87*, 779-795.
- Wan, E. W., Rucker, D. D., Tormala, Z. L., & Clarkson, J. J. (2010). The effect of regulatory depletion on attitude certainty. *Journal of Marketing Research*, *47*, 531-541.
- Willis, J., & Todorov, A. (2006). First impressions: Making up your mind after 100-ms exposure to a face. *Psychological Science*, *17*, 592-598.