DOI: 10.1111/bjso.12902

ARTICLE



the british psychological society prometing excellence in psycholog

Elaboration moderates reliance on metacognitive assessments: The case of attitude certainty

Lorena Moreno¹ | Pablo Briñol² | Richard E. Petty³

¹Department of Behavioral Sciences, IE University, Segovia, Spain

²Department of Psychology, Universidad Autónoma de Madrid, Madrid, Spain

³Department of Psychology, The Ohio State University, Columbus, USA

Correspondence Lorena Moreno, IE University, Segovia, Spain. Email: Imoreno@faculty.ie.edu

Funding information Templeton World Charity Foundation; Ministerio de Ciencia e Innovación

Abstract

The circumstances under which people are more likely to use their attitude certainty were examined. Across three studies, participants shared their attitudes on current topics (e.g. refugees). Then, attitude certainty was either measured or manipulated, depending on the study. Elaboration was assessed via need for cognition or manipulated after forming attitudes and certainty, just before the behavioural decision. Attitudes, certainty, and elaboration served as predictors of different behavioural outcomes (e.g. enrolling in a mentoring programme). As predicted, attitudes guided behaviour. Furthermore, the greater the certainty, the greater attitudebehaviour correspondence (A-B consistency), replicating the traditional effect. Most relevant, the effect of already existing attitude certainty in moderating A-B consistency was more likely to occur for high (vs. low) elaboration participants. Following Self-Validation Theory (Briñol & Petty, Psychol. Rev., 129, 2022, 340), this research showed that elaboration can moderate reliance on metacognition determining A-B consistency.

KEYWORDS

attitudes, behaviour, certainty, elaboration

INTRODUCTION

Attitudes influence behaviour across various domains (Fazio, 1990; Fishbein & Ajzen, 1975; McGuire, 1985; Petty et al., 2019; Pierro et al., 2012). However, much research has shown that attitudes predict behaviour better when they are strong rather than weak (Petty & Krosnick, 1995). Several indicators of attitude strength affect attitude-behaviour (A–B) consistency, including certainty, accessibility, structural consistency, and knowledge (Luttrell & Sawicki, 2020).

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2025 The Author(s). British Journal of Social Psychology published by John Wiley & Sons Ltd on behalf of British Psychological Society.

Certainty as an attribute of attitude strength

Attitudes can vary in their strength, defined by their durability over time, resistance to change, and impact (Krosnick & Petty, 1995). Attitude certainty, a dimension of attitude strength, refers to a sense of validity concerning an attitude (Gross et al., 1995) and involves a meta-cognitive assessment (i.e. 'Is my evaluation correct?') about an initial cognition (i.e. the attitude itself).

Initial conceptualizations of attitude certainty (or confidence) focused on its structural origins, such as issue-relevant knowledge (Wood et al., 1995), direct experience (Fazio & Zanna, 1981), and the extent of thought behind the attitude (Petty & Cacioppo, 1986). Notably, attitude certainty can develop without structural differences. Research has demonstrated that mere belief – via bogus feedback – that an attitude stems from considerable thought (Barden & Petty, 2008; Moreno et al., 2021), two-sided information (Rucker et al., 2008) or morality (Luttrell et al., 2016) can strengthen attitude certainty and the subsequent consequences. Thus, attitude certainty can have multiple antecedents and important consequences.

Recent studies illustrate the importance of attitude certainty in guiding behaviour. Moreno et al. (2021), for example, examined A–B consistency in the context of pro-social behaviour. In one study, undergraduates were asked to report their attitudes towards instituting comprehensive exams before their graduation as well as their attitude certainty. At the end of the study, participants were given the opportunity to enrol in a mentoring programme designed to help other students prepare for exams. As predicted, this study revealed that more positive attitudes towards exams were associated with more prosocial behaviour, as indicated by participants' actual enrolment in the mentoring programme related to exams. In line with past research on attitude strength (Rucker et al., 2014; Tormala & Rucker, 2018), the study also showed that greater attitude certainty was associated with more A–B consistency.

These moderating effects of attitude certainty on A–B consistency have also been found in research manipulating (rather than measuring) certainty. For example, Fazio and Zanna (1978) randomly assigned participants to work on or to just read about several puzzles (e.g. mazes, general reasoning tasks, spatial perspective tests). This manipulation of direct experience (working on puzzles) versus indirect experience (reading about them) was designed to influence attitude certainty. Along with measuring the impact of this manipulation on certainty, participants' attitudes towards the problems and subsequent behaviour relevant to those attitudes were also assessed. As predicted, results showed that attitudes were more predictive of behaviour under conditions of high (direct experience) rather than low (indirect experience) certainty. As these examples illustrate, attitudes held with higher certainty are more likely to guide behaviour, whether certainty is measured or manipulated (see also Berger & Mitchell, 1989; Krishnan & Smith, 1998; Rucker & Petty, 2004; Tormala & Petty, 2004). This research extends previous work on attitudes by examining *when* and *for whom* attitude certainty is more likely to be considered.

Experiencing vs. using attitude certainty

Metacognitive processes include two stages: formation of metacognitive experiences and the use of those experiences (i.e. metacognitive monitoring and control, respectively; Dunlosky & Metcalfe, 2008; Nelson, 1990; Norman et al., 2019). For example, a person can first have a metacognitive experience associated with an attitude (e.g. experiencing that one's attitude comes to mind easily) which can affect their perceived certainty in that evaluation. Second, the individual can use that metacognitive assessment (attitude certainty) to determine the influence of that attitude on relevant behaviour. This research focused on this distinction between experiencing and using metacognition.

Although experiencing and using those metacognitions are related processes, research has shown that they are conceptually and empirically distinct (Briñol et al., 2004; Briñol, Barden, & Petty, 2007; Briñol, Petty, et al., 2007; Clark & Thiem, 2015; Clark et al., 2011; Clarkson et al., 2011; Horcajo et al., 2014; Noah et al., 2018; Norman et al., 2019; Petty et al., 2002; Tormala et al., 2002, 2007; Yahalom & Schul, 2013). For example, individuals can experience low certainty in an attitude but fail to

consider this metacognition before deciding to act, thus still relying on their attitude to guide behaviour. People can also experience high certainty in an attitude but still do not use that certainty in deciding how to act if they do not take that metacognitive certainty into consideration when making decisions. In other words, having a metacognitive experience does not necessarily guarantee that it will impact subsequent judgement or behaviour. Of course, not having the metacognitive experience precludes its use. In those cases in which metacognitive assessments are experienced but not used, a person with high certainty would act identically to another person with low certainty, failing to take those differential metacognitive assessments into consideration. Thus, regardless of whether attitudes are favourable or unfavourable, people can experience different degrees of certainty in that attitude. But only when people engage in the second stage, metacognitive usage, will the attitude certainty influence whether the person relies on their attitude to guide behaviour.

Self-Validation Theory

Self-Validation Theory (SVT, Briñol & Petty, 2022) is a conceptual framework that identifies unique and testable moderators of experiencing and using metacognitive assessments of validity. A key notion of SVT is that initial cognitions can become more consequential (i.e. relied upon more for making judgements and engaging in behaviour) as the perceived validity (certainty) of those cognitions increases. Most relevant to the current studies, SVT also postulates that metacognitive processes (both experience and usage) are more likely to occur when thinking is increased. That is, because considering attitude certainty is a metacognitive process, it should require a greater extent of thinking to experience such metacognition and then use that metacognition than it does to not engage in metacognitive processes. The implication for this work is that, for attitude certainty effects to be consequential, individuals must not only consider their relevant attitude(i.e. making a metacognitive assessment and then using that assessment).

Beyond SVT, prior research suggests that the amount of thinking is relevant to metacognitive processes, especially to the initial 'experience' stage (Efklides, 2006; Koriat, 2007; Nelson, 1990; Tugtekin & Odabasi, 2022). However, this previous research has not explored the role of elaboration in distinguishing between metacognitive stages.¹ Also, previous SVT research is ambiguous regarding the role of elaboration because it does not provide distinct evidence about the experience versus the use of metacognition. For example, some SVT studies showed that validating variables impacted certainty more for high-thinking individuals or conditions, suggesting that thinking influenced the experience of metacognition (Briñol, Barden, & Petty, 2007; Briñol, Petty, et al., 2007; Clark & Thiem, 2015). However, other studies showed that the validating variables affected certainty for both high-and low-thinking individuals equally, suggesting that the impact of thinking was on the use of metacognition (Petty et al., 2002; Tormala et al., 2006).

The novelty of the present research lies in distinguishing between these two metacognitive stages (experience vs. usage) manipulating the extent of thinking after inducing certainty, and therefore controlling (rather than simply measuring) that thinking is not influencing the experience of certainty. Studies 2 and 3 of the present research are especially relevant for establishing that distinction. In these studies, rather than measuring or manipulating thinking at the beginning of the study, as all prior research has done, thinking was manipulated *after* the experience of certainty but before the final behavioural measure. That is, elaboration was manipulated following the initial certainty induction and therefore once the experience of certainty had already been established. Thus, this work allowed us to

¹Elaboration is a mental process that is enhanced when people have the motivation and ability to engage in extensive thinking before making a judgement. Elaboration involves attempting to access relevant associations, images, and experiences from memory, scrutinizing these associations, and drawing inferences from them (Petty & Cacioppo, 1986). In the present research, the terms elaboration and thinking will be treated interchangeably.



FIGURE 1 Illustration of the theoretical framework. Panel A: Moderating effects of elaboration on metacognitive experience. Panel B: Moderating effects of elaboration on metacognitive usage.

distinguish the role of elaboration in prior research (moderating the impact of validating variables on the experience of attitudinal certainty; see Figure 1, Panel A) from its new role, where elaboration moderates the use of already experienced certainty (Figure 1, Panel B).

Overview

Three studies were conducted to test the extent to which elaboration can moderate the effects of attitudes and attitude certainty on subsequent social behaviour. Study 1 tested the extent to which attitudes towards social media would be more predictive of relevant behaviour as a function of attitude certainty. Importantly, this study was designed to examine the SVT prediction that the typical moderation of A–B consistency by attitude certainty is more likely to emerge when participants reported a higher degree of thinking. This first study used a correlational design in which attitudes, attitude certainty, and elaboration were all measured and served as predictors of behaviour. Studies 2 and 3 moved to an experimental design by manipulating attitude certainty and elaboration to infer the causal role of these variables. Additionally, these studies also varied the attitude object to gain generalization across topics, materials, inductions, and measures. Specifically, these studies examined to what extent attitudes towards refugees would be capable of guiding behavioural intentions in Study 2 (willingness to defend the refugee's University admission) and actual behaviour in Study 3 (enrolment in a real mentoring programme designed to help Ukrainian students in a Spanish university).

In sum, we expected attitudes to predict behaviour, and to do so better in some conditions than in others. Specifically, our first goal was to replicate the typical moderating effect of attitude certainty on A–B consistency (i.e. the greater the certainty in one's attitudes, the greater the relationship between attitudes and behaviours). We also predicted elaboration to moderate A–B consistency. Prior research examining A–B consistency has investigated the moderating role of elaboration using multiple approaches: ranging from reports of subjective elaboration (see Barden & Petty, 2008; Requero et al., 2020) and individual differences in need for cognition (see Horcajo et al., 2019) to experimental manipulations of personal relevance and mental load (Kredentser et al., 2012; Petty et al., 1981). Despite the differences in these three methodological approaches, the results showed convergent evidence: When individuals engage in high elaboration before forming their attitude, the attitude is more likely to be consequential (e.g. predict behaviour) than when elaboration is low. Thus, we expected to replicate the interaction between attitudes and elaboration when elaboration involved the thoughtful consideration of the attitude, as shown in prior research.

Most relevant to the present concerns, this research was designed to examine the novel SVT prediction according to which those effects of attitude certainty on A–B consistency would be more likely to occur for high rather than low elaboration participants, regardless of whether elaboration

was measured (Study 1) or manipulated *after* certainty was already induced (Studies 2 and 3). There are two reasons elaboration can moderate the impact of certainty on A–B consistency. On the one hand, it could be that elaboration enhances the experience of certainty (i.e. without high elaboration, there would be no certainty to use). On the other hand, elaboration could also lead to greater use of certainty once it has been formed already. Studies 2 and 3 specifically examine elaboration's role in the second stage (use of certainty) by manipulating elaboration after attitude certainty has formed. This three-way interaction between attitudes, certainty, and elaboration was tested in the following three studies varying materials, inductions, and procedures. Additional details on methodology, analyses, and findings can be found in Supporting information S1.

STUDY 1

The initial study examined which people are most likely to rely on attitude certainty in guiding their behaviour. We first measured participants' attitudes towards social media. These attitudes served as the initial cognition. Then, the certainty associated with those attitudes was measured. This measure of certainty was the secondary cognition (metacognitive assessment). Along with attitudes and certainty, participants' need for cognition was also assessed (NC, Cacioppo & Petty, 1982). That is, participants in this study were asked to respond to a short measure of NC (Bizer et al., 2000) to classify them according to their chronic motivation to engage in and enjoy thinking. Therefore, individual differences in NC served as a proxy to assess the extent of elaboration in this study. Prior research has shown that individuals high in NC are more likely to think in a variety of situations and are also more likely to engage in metacognitive assessments (i.e. make judgements of certainty; Tormala et al., 2002, 2006; see Cacioppo et al., 1996; Petty et al., 2009; for reviews).² Finally, we included a behavioural outcome as a dependent measure. Participants' behaviour was assessed by recording the number of promotional codes relevant to the attitude object (promotional codes about a social media platform) that they decided to take with them at the end of the study (see Paredes et al., 2021, for similar behavioural outcomes).

First, we expected attitudes towards social media to be associated with the number of promotional codes taken. Second, we expected this association to be especially likely to emerge as certainty increased. Therefore, we expected to find the traditional two-way interaction in which the greater the certainty in one's attitudes, the larger A–B consistency. Furthermore, we also expected to find the two-way interaction in which elaboration moderates A–B consistency (i.e. the greater the extent of thinking, the larger the correspondence between attitudes and behaviours). Most importantly, we expected to find a three-way interaction between attitudes, attitude certainty, and NC on behaviour. Specifically, we hypothesized that the classic moderating effect of attitude certainty on A–B consistency would be more likely to emerge for high rather than low NC individuals.

Method

Participants and design

Ethical approval was obtained for this study, which involved 188 psychology undergraduates (161 females and 27 males), all participating anonymously in exchange for course credit. The age ranged from 18 to 23 ($M_{age} = 18.78$, SD = 0.99). Attitudes towards social media (continuous variable), attitude certainty (continuous variable) and NC (continuous variable) were included as predictor variables, whereas behaviour related to a social media platform was measured as the dependent variable. Our final sample

²Since elaboration in this study was assessed by measuring participants' NC, individual differences in NC may not only influence the use of certainty but also contribute to the formation or experience of certainty.

size was determined by the number of participants that we were able to collect during the week in which the study was posted, with the expectation that we would obtain 200 participants. The final sample size obtained (N=188) allowed us to detect an interaction effect size of Cohen's $f^2 = .042$ using a two-tailed test and a power of .80.

Procedure

Upon arrival, participants were told that they were taking part in a study to validate materials for future research. First, participants reported their attitudes towards social media, then their certainty in their attitudes. Next, they were asked to complete the measure of NC. At the end of the study, participants were told that their university was taking part in the development of a new social media platform for students. The social media platform was described as one in which they could talk with other students, improve, and practice other languages at their university and meet new people while being in a European university exchange programme (Erasmus). Participants were told that, as a parting gift, they could take up to five promotional codes which would give them free use of this new social media platform for up to 5 months. Finally, participants were thanked, debriefed, and dismissed.

Predictor variables

Attitudes

Attitudes towards social media were assessed using the short form of the Crites et al. (1994) attitude scale. Specifically, four 9-point items asked participants to rate social media using the following semanticdifferential scales: *dislike–like, negative–positive, bad–good, unfavourable–favourable*. Item ratings were highly intercorrelated (α = .87), thus they were averaged to create a merged measure of attitudes towards social media. These items have been used in previous research (Gandarillas et al., 2018).

Attitude certainty

Attitude certainty was measured using two questions: 'To what extent are you certain about your opinion of social media?' and 'To what extent are you confident about your opinion of social media?' Responses were recorded on 9-point scales ranging from 1 (*Not at all certain/confident*) to 9 (*Very certain/confident*). Item ratings were significantly intercorrelated, r(186) = .52, p < .010, thus were averaged to create a merged certainty index. This measure has been shown to be a reliable way to assess attitude certainty in previous research (DeMarree et al., 2020).

Need for cognition (NC)

This scale reflects individual differences in the tendency to engage in and enjoy effortful cognitive activities across a wide range of domains (Cacioppo & Petty, 1982). Individuals who fall at the upper end of the continuum (high in NC) tend to engage in and enjoy cognitively challenging activities, whereas individuals who fall at the lower end of the continuum (low in NC) tend to exhibit relatively less engagement and less enjoyment of cognitively challenging tasks. In this study, participants completed the simplified version of the scale developed by Bizer et al. (2000). This efficient version of NC has been successfully used in previous research to classify individuals according to the chronic propensity to engage in extensive thinking (Tian, 2011; Valenzuela et al., 2019). This short scale included the following two items: 'Do you like to have responsibility for handling situations that require a lot of thinking' and 'Do you like to solve complex problems instead of simple ones'. Each item was answered on a 9-point scale ranging from 1 (*I dislike a lot*) to 9 (*I like a lot*). Participants' answers to each item were averaged to form a composite index of NC, r(186) = .73, p < .010.

Dependent variable: Behaviour related to social media

Participants' behaviour was assessed by recording the number of promotional codes for the new social media platform that they decided to take with them at the end of the study. Specifically, they were told that each promotional code gave them access to a free trial of a new social media platform developed by their university. Participants could take from 0 to 5 promotional codes to freely use this new media platform. If participants took one code, they would have access to 1 month for free. If they took the five codes, they could use the social media platform for free for 5 months. Similar measures involving the selection of coupons in natural settings have been used in previous research as a successful behavioural outcome (Paredes et al., 2021). This measure was scored so that taking more promotional codes represented greater intentions to use the social media platform developed by their university.

Results

Certainty

The measure of certainty was submitted to a hierarchical regression analysis using attitudes (centred), NC (centred) and their interaction as predictor variables. Following the suggestions of Cohen and Cohen (1983), the main effects were interpreted in the first step of the regression and the two-way interaction in the final step. Results revealed a significant main effect of NC, indicating that higher levels of NC were associated with greater certainty, b=0.52, t(185)=5.19, p<.001, 95% CI [0.32, 0.72]. No other effects reached significance ($ps \ge .232$).

Behaviour related to social media

The number of promotional codes was submitted to a hierarchical regression analysis using attitudes (centred), certainty (centred), NC (centred), and their interactions as predictor variables. Main effects were interpreted in the first step of the regression, two-way interactions in the second, and the three-way interaction in the final step. Further details can be found in Tables S1 and S2.

Results showed a significant main effect of attitudes such that relatively more favourable attitudes were associated with greater engagement in relevant behaviour, b = 0.26, t(184) = 2.10, p = .037, 95% CI: [0.02, 0.51], Cohen's $f^2 = .024$. No other main effect reached significance ($ps \ge .878$).

The predicted two-way interaction between attitudes and attitude certainty on behaviour also emerged, b=0.20, t(183)=2.02, p=.045, 95% CI: [0.00, 0.39], Cohen's $f^2=.022$. This pattern revealed that participants' attitudes predicted behaviour for participants reporting higher levels of certainty in their attitudes (+1*SD*), b=0.49, t(183)=2.92, p=.004, 95% CI: [0.16, 0.82], but not for those reporting lower levels of certainty (-1*SD*), b=-0.01, t(183)=-0.06, p=.953, 95% CI: [-0.37, 0.35]. The two-way interaction between attitudes and NC on behaviour was also significant, b=0.39, t(183)=2.64, p=.009, 95% CI: [0.10, 0.68], Cohen's $f^2=.038$. Participants' attitudes predicted behaviour for participants who were relatively high in their NC (+1*SD*), b=0.58, t(183)=3.37, p=.001, 95% CI: [0.24, 0.92], but not for those who were relatively low in their NC (-1*SD*), b=-0.10, t(183)=-0.55, p=.582, 95% CI: [-0.47, 0.26]. The two-way interaction between certainty and NC on behaviour was not significant, b=0.15, t(183)=1.03, p=.303, 95% CI: [-0.13, 0.43], Cohen's $f^2=.006$.

Of critical importance, the expected three-way interaction between attitudes, certainty, and NC on behaviour was significant, b = 0.27 t(180) = 2.20, p = .029, 95% CI: [0.03, 0.50], Cohen's $f^2 = .027$. As illustrated in Figure 2, the three-way interaction showed that the moderation of A–B consistency by attitude certainty varied as a function of NC. As predicted, the key interaction between attitudes and certainty emerged only for participants who were relatively high in their NC (+1*SD*), b = 0.64 t(180) = 2.99, p = .003, 95% CI: [0.22, 1.07]. Specifically, attitudes significantly predicted



FIGURE 2 Number of promotional codes to use a new social media platform as a function of attitudes and certainty when NC/elaboration was high (+1*SD*, Top Panel) and when NC/elaboration was low (-1*SD*, Bottom Panel).

behaviour for participants reporting relatively higher levels of certainty in their attitudes (+1*SD*), b = 0.89 t(180) = 4.11, p < .001, 95% CI: [0.47, 1.32]. However, the effect of attitudes on behaviour was not significant for those reporting relatively lower levels of certainty (-1*SD*), b = -0.23 t(180) = -0.80, p = .424, 95% CI: [-0.81, 0.34]. The interaction between attitudes and certainty on behaviour was not significant for participants who were relatively low in their NC (-1*SD*), b = -0.03 t(180) = -0.15, p = .881, 95% CI: [-0.47, 0.40].³

 3 No significant main effects emerged under low elaboration (*ps* > .483).

Discussion

Attitudes towards social media predicted relevant behaviour in this domain. The results of this study also replicated previous research showing that attitudes were better predictors of behaviour when held with relatively high rather than low certainty (e.g., Clarkson et al., 2008). Moreover, there was also more A–B consistency for those with high NC, a result also consistent with past research on NC (e.g., Horcajo et al., 2019).

Beyond replicating the main effect of attitudes and both two-way interactions (i.e. moderation of A–B consistency by certainty, and moderation of A–B consistency by elaboration), the results of this study revealed that attitude certainty predicted A–B consistency to a greater extent when the extent of thinking (as assessed with NC) was relatively high. Thus, for those participants who reported being high in NC, and thus more thoughtful in making decisions, the ability of attitudes to predict behaviour was greater for those who indicated a relatively high versus low degree of certainty. This was not the case for those lower in NC.

Given that elaboration was assessed in this study by measuring participants NC, the results obtained are open to multiple interpretations. For example, the individual differences in NC could be leading not only to the usage of certainty but also to the formation or experience of certainty, as suggested by the effect of NC on certainty. That is, this measure of elaboration could be affecting the first metacognitive stage rather than or in addition to the second metacognitive stage (metacognitive use). Furthermore, there might be some confounding variables that co-vary with individuals' certainty and/or NC.

To deal with these potential interpretational issues, Study 2 relied on an experimental design in which both certainty and elaboration were manipulated within the same study. Even more relevant, elaboration was manipulated after measuring attitudes and manipulating certainty but just before the behavioural outcome to isolate its impact at the time of the behavioural intentions. This change is especially important given that, as explained before, this research was designed to examine the role of elaboration on the second metacognitive stage focused on using (rather than experiencing) certainty. Finally, Study 2 was also designed to have a higher level of specificity between the attitudinal and the behavioural measure. That is, whereas in the first study we measured attitudes towards social media in general but then assessed a specific behaviour regarding a concrete social media platform, in the next study, attitudes and behavioural outcome were better matched in level of specificity, in accordance with recommendations to enhance A–B consistency overall (Ajzen & Fishbein, 1977).

STUDY 2

This study was designed to replicate and extend prior findings by manipulating certainty and elaboration, as well as by focusing on a new attitudinal domain. Therefore, this study introduced several important changes. First, participants were asked to report their attitudes towards Ukrainian refugees (initial cognition). Then, certainty in those attitudes was manipulated (rather than measured as in the first study) to be relatively high or low (secondary cognition). Specifically, participants were randomly assigned to either recall past episodes of confidence or past episodes of doubt. The idea behind this induction is that the certainty experienced after recalling a past episode can be misattributed to any currently activated construct, in this case attitudes towards Ukrainian refugees. Only after measuring attitudes and after creating different levels of certainty, elaboration was manipulated. That is, in this study, the manipulation of elaboration was designed to keep attitudes and attitude certainty unaffected (since the elaboration induction came afterwards), while influencing participants' motivation and ability to think about their behaviour. This change was introduced to examine the role of elaboration on the use of the already existing certainty (the main goal and novelty of the present research). Finally, participants were asked to report their intentions to advocate in favour of integrating more refugees from Ukraine, an outcome that served as a dependent measure.

Despite these variations, we still expected attitudes to be associated with behavioural intentions. Second, we expected this A–B consistency effect to be especially likely to emerge when certainty in one's attitudes was manipulated to be high rather than low. Most relevant for the present purposes, we also anticipated finding evidence for the SVT prediction that manipulated elaboration would moderate the typical two-way interaction between attitudes and certainty on behavioural intentions. Specifically, we expected that the effect of induced certainty on A–B consistency would be more likely to emerge for participants assigned to the high rather than low elaboration condition. Thus, a three-way interaction between attitudes, manipulated certainty, and manipulated elaboration on behavioural intentions was hypothesized.

Method

Participants and design

Ethical approval was obtained for this study, which involved 324 psychology undergraduates (322 females, 38 males, and 14 unidentified), all participating anonymously in exchange for course credit. The age ranged from 17 to 57 (M_{agg} = 19.51, SD = 2.50). Participants were randomly assigned to conditions in a 2 Attitude Certainty (High vs. Low) × 2 Elaboration (High vs. Low) design, with attitudes as an additional continuous predictor. Behavioural intentions related to refugees were included as the dependent variable. Based on the effect size for the three-way interaction in Study 1 (Cohen's f^2 = .027), results indicated that the desired sample size for a two-tailed test (α = .05) with .80 power was N = 293 participants. Our final sample size exceeded the estimated one because we collected data until the end of the second week in which the study was available for students to participante.⁴ The final sample size (374) allowed us to detect an interaction effect size of Cohen's f^2 = .021 using a two-tailed test and a power of .80.

Procedure

Upon arrival, participants were told that they would attend a meeting at the end of the study. The main goal of the meeting would be to discuss topics related to the crisis in Ukraine. Then, participants were asked to report their attitudes towards Ukrainian refugees. Next, certainty in those attitudes was manipulated to be relatively high or low. After this induction of certainty, elaboration was also manipulated. This manipulation of elaboration was designed to affect simultaneously participants' motivation and ability to think about their behaviour, without affecting attitudes and certainty. Afterwards, all participants were told that before attending the meeting mentioned at the beginning of the study, they would have to indicate what position they would prefer to take in the upcoming discussion. Specifically, participants were asked to report their intentions to advocate in favour of integrating more refugees in Spain. The cover story for the previous choice tasks was that this would allow the researchers to create different groups based on their preferences. Finally, participants were debriefed, thanked, and dismissed.

Predictor variables

Attitudes

Attitudes towards Ukrainian refugees were assessed using the same four 9-point scale items of Study 1. Item ratings were highly intercorrelated ($\alpha = .74$), they were averaged to create a merged measure of attitudes.

⁴When analysing the data with the first 293 participants, the three-way interaction between attitudes, certainty, and elaboration was significant, b = 0.23, t(285) = 1.99, p = .047, 95% CI: [0.00, 0.47].

Attitude certainty

Participants were randomly assigned to either a high or low certainty condition. In the high certainty condition, participants were asked to recall and describe a past personal episode in which they felt confidence. In the low certainty condition, participants were asked to recall and describe a past personal episode in which they felt doubt. Prior research has shown that this manipulation can lead people to misattribute the high or low certainty induced by the writing task to the mental content activated previously, even though this content is unrelated to the episodes described (Moreno et al., 2022; Paredes et al., 2021; Petty et al., 2002; for equivalent priming procedures based on recalling past episodes see also Schwarz & Clore, 1983; Strack et al., 1985).

Elaboration

Before engaging in behaviour, participants were randomly assigned to either a high or low elaboration condition. Elaboration was manipulated by two simultaneous inductions: one based on personal relevance and the other based on cognitive load. Personal relevance is a determinant of motivation to think, with higher relevance motivating more thinking (Blankenship & Wegener, 2008; Petty & Cacioppo, 1990). Cognitive load is a variable that influences the ability or capacity to think, with higher load reducing the ability to think (Cacioppo & Petty, 1989; Ratneshwar & Chaiken, 1991). In the high elaboration condition, participants were told that their answers would be especially important to make decisions in the future (high personal relevance). In addition, they were asked to memorize a short list of three single-digit numbers (low mental load). In the low elaboration condition, participants were told that their answers might be or might not be taken into consideration in the future and were asked to memorize a longer list of seven single-digit numbers (high mental load). Participants were asked to rehearse the list of numbers in their mind at the time of behaviour, and they were told that they would be asked to provide the numbers to the researcher at the end of the study. We used multiple elaboration inductions (mental load and relevance) at the same time to strengthen the elaboration manipulation (Kredenster et al., 2012; Moreno et al., 2024; Tormala et al., 2002).⁵

Dependent variable: Advocate in favor of integrating refugees

Participants were led to believe that they would have to attend a meeting at the end of the study to discuss Ukrainian refugees' integration at their university. Before joining this supposed meeting, they were asked to answer two questions regarding their intentions to advocate in favour of admitting refugees to the University during the subsequent encounter: 'To what extent are you willing to defend the Ukrainian refugees' admission to the University in the forthcoming debate?' (1 = I will not defend refugees' admission to 9 = I will defend refugees' admission) and 'To what extent are you willing to convince other people about the importance of admitting Ukrainian refugees?' (1 = I will not convince others to 9 = I will convince others). These two measures were significantly correlated, r(372) = .52, p < .010, and were thus averaged to form one dependent measure of intentions regarding the admission of Ukrainian refugees. Similar items had been used in prior research (Ekinci & Van Lange, 2023; Verkuyten et al., 2018). These measures are in line with current efforts to promote prosocial behaviour (Böckler et al., 2016; Pfattheicher et al., 2022) and particularly refugees' integration into Spanish society (Yitmen & Verkuyten, 2018). Indeed, understanding the processes that can contribute to promoting refugees' integration is an important outcome to achieve (Echterhoff et al., 2020, 2022).

^{2044309, 2025, 3,} Downloaded from https://bpspxchub.onlinelibrary.wiley.com/doi/10.1111/bjs0.12902, Wiley Online Library on [03:06/2025], See the Terms and Conditions (https://ilnihelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

⁵We would not expect differences in the results depending on whether participants' extent of elaboration was more impacted by the capacity or by the relevance component of the elaboration manipulation.

Results

Attitudes

Attitudes were submitted to a Certainty × Elaboration ANOVA. Results showed that attitudes did not vary as a function of induced certainty, F(1, 370) = 0.17, p = .678, or induced elaboration, F(1, 370) = 2.93, p = .088. The interaction between certainty and elaboration on attitudes also was not significant, F(1, 370) = 1.79, p = .182.

Certainty

To ensure that there was no failure of random assignment, the induction of certainty was submitted to a logistic binary regression analysis using attitudes (centred), elaboration (-1 = Low; 1 = High) and their interaction as predictor variables. Main effects were interpreted in the first step of the regression, and the two-way interaction in the final step. No effect reached significance ($ps \ge .171$).

Intentions: Advocating in favour of integrating refugees

Behavioural intentions were submitted to a hierarchical regression analysis using attitudes (centred), certainty (-1 = Low; 1 = High), elaboration (-1 = Low; 1 = High) and all their interaction terms as predictor variables. Further information is available in Tables S3 and S4.

Results showed a significant main effect of attitudes such that relatively more favourable attitudes were associated with greater behavioural intentions, b=0.42, t(370)=3.93, p<.001, 95% CI: [0.21, 0.64], Cohen's $f^2=.042$. No other main effect reached significance ($ps \ge .131$). The predicted two-way interaction between attitudes and certainty on behavioural intentions was also significant, b=0.27 t(369)=2.55, p=.011, 95% CI: [0.06, 0.48], Cohen's $f^2=.018$. This pattern revealed that attitudes were significant predictors of behavioural intentions for participants assigned to the high certainty condition, b=0.71, t(369)=4.59, p<.001, 95% CI: [0.40, 1.01], but not for those assigned to the low certainty condition, b=0.16, t(369)=1.08, p=.281, 95% CI: [-0.13, 0.45]. The two-way interaction between attitudes and elaboration on behavioural intentions was also significant, b=0.23, t(369)=2.10, p=.036, 95% CI: [0.01, 0.44], Cohen's $f^2=.012$. This effect showed that attitudes predicted behavioural intentions to a greater extent for participants assigned to the high elaboration condition, b=0.64, t(369)=4.31, p<.001, 95% CI: [0.35, 0.93], than for those assigned to the low elaboration condition, b=0.19, t(369)=1.18, p=.239, 95% CI: [-0.12, 0.49]. The two-way interaction between certainty and elaboration on behavioural intentions was not significant, b=-0.05, t(369)=-0.48, p=.631, 95% CI: [-0.27, 0.16].

Of critical importance, the expected three-way interaction between attitudes, certainty, and elaboration on intentions was significant, b = 0.24 t(366) = 2.21, p = .028, 95% CI: [0.03, 0.45], Cohen's $f^2 = .013$.⁶ As illustrated in Figure 3, the three-way interaction showed that the pattern of effects varied as a function of elaboration condition. As predicted, the key interaction between attitudes and attitude certainty on behavioural intentions emerged only for participants who were assigned to the high elaboration condition, b = 0.49 t(366) = 3.38, p < .001, 95% CI: [0.21, 0.78]. Specifically, more favourable attitudes were associated with greater behavioural intentions for participants assigned to the high certainty condition, b = 1.15 t(366) = 5.47, p < .001, 95% CI: [0.74, 1.57]. For those assigned to the low certainty condition, the effect was not significant, b = 0.16 t(366) = 0.81, p = .420, 95% CI: [-0.24, 0.56]. The interaction

⁶When the two items that formed the general index of intentions to defend Ukrainian refugees' integration were analysed separately, the three-way interaction between attitudes, certainty and elaboration was significant for the item about *convincing others about the importance of admitting refugees*, b = 0.24t(366) = 1.96, p = .050, 95% CI: [0.00, 0.49]. With regard to the item regarding *defending refugees' admission in a meeting*, the interaction did not reach significance but followed the same pattern, b = 0.23t(366) = 1.86 p = .064, 95% CI: [-0.01, 0.47].



FIGURE 3 Intentions as a function of attitudes and certainty when elaboration was high (top panel) and when elaboration was low (bottom panel).

between attitudes and certainty was not significant for participants who were assigned to the low elaboration condition, b = -0.02t(366) = 0.15, p = .881, 95% CI: [-0.28, 0.33].⁷

Discussion

Results of this second study found evidence for A-B consistency in the context of Ukrainian refugees' integration into Spanish society. Using a manipulation (rather than a measure) of certainty, this study

⁷No significant main effects emerged under low elaboration (ps > .221).

revealed that A–B consistency was greater for those assigned to high (vs. low) certainty conditions, replicating one more time prior findings in the literature on attitude strength. Manipulated elaboration was also found to moderate A–B consistency (showing that high vs. low elaboration conditions led to greater A-B consistency). Given that an innovation of this study was manipulating elaboration at the time of behavioural intentions, to the best of our knowledge, this effect is a novel result of the present research. This finding seems to show that people are more likely to consider and retrieve their attitudes when thinking at the time of behavioural consideration was high.

Most relevant for the present concerns, Study 2 also replicated the effect of elaboration on the use of metacognition. Consistent with SVT predictions, the results of this study demonstrated that the typical effect of already existing attitude certainty on A–B consistency occurred only when elaboration at the time of behavioural consideration was high (vs. low). Importantly, we generalized such effects using different materials, measures, and operationalizations and when attitudes and certainty were not affected by the elaboration induction.

Although behavioural intentions are generally reliable predictors of people's actual behaviour (Bleske-Rechek et al., 2010; Fishbein & Ajzen, 2010; Van Zomeren et al., 2008; Webb & Sheeran, 2006; Yitmen & Verkuyten, 2018; see Morwitz & Munz, 2020 for a review), it is also important to examine the impact of predictions for actual behaviour. With this goal in mind, a final study was designed to gain ecological validity by examining actual behaviour in a more natural setting.

STUDY 3

This final study was designed to test our predictions on actual behaviour. As described next, the behavioural outcome of this study consisted in the enrolment of participants in a real programme designed to help Ukrainian students at their university. In addition, appropriate manipulation checks for the elaboration induction were included in this final study. This was important to demonstrate that the induction of elaboration combining both ability and motivation factors was affecting participants' extent of thinking.

Participants in this study were first asked to report their attitudes towards Ukrainian refugees (initial cognition). Then, certainty (secondary cognition) and elaboration were both manipulated following the very same procedure used in Study 2. Finally, participants had the opportunity to enrol in a real programme designed to help Ukrainian students. We recorded whether participants signed up for that programme or not, and that choice served as the dependent measure of this study (see Moreno et al., 2021, for a similar behavioural outcome in a domain unrelated to refugees). At the end of the study, participants completed an elaboration check.

Despite these variations, we expected to find A–B consistency and predicted that the association between attitudes and behaviour to be especially strong when certainty in one's attitudes was manipulated to be high rather than low. Consistent with SVT, we also expected manipulated elaboration to moderate that two-way interaction between attitudes and certainty on actual behaviour.

Method

Participants and design

Ethical approval was obtained for this study, which involved 345 psychology undergraduates (297 females, 46 males, 5 non-binary and 6 unidentified), all participating anonymously in exchange for course credit. The age ranged from 18 to 29 ($M_{age} = 19.45$, SD = 1.65). Participants were randomly assigned to conditions in a 2 Attitude Certainty (High vs. Low) × 2 Elaboration (High vs. Low) design, with attitudes as an additional continuous predictor. Behaviour relevant to the attitudinal object was included as the dependent variable. Based on the average effect size for the three-way interaction in the

two previous studies (Cohen's $f^2 = .020$), results indicated that the desired sample size for a two-tailed test ($\alpha = .05$) with .80 power was N = 395 participants. Our final sample size was determined by the number of participants that we were able to collect before the end of the semester. The final sample size (345) allowed us to detect an interaction effect size of Cohen's $f^2 = .023$ using a two-tailed test and a power of .80.

Procedure

Participants were first asked to report their attitudes towards Ukrainian refugees. Next, certainty and elaboration were both manipulated following the same procedures used in Study 2. Then, a real programme designed to help Ukrainian refugees was described. Participants had the opportunity to enrol in this programme and we recorded whether participants signed up. At the end of the study, participants completed an elaboration check and filled out several socio-demographic questions (i.e. gender and age). Finally, they were debriefed, thanked, and dismissed.

Predictor variables

Attitudes

Attitudes towards Ukrainian refugees were assessed using the same four 9-point items of previous studies. Item ratings were highly intercorrelated ($\alpha = .76$), thus they were averaged to create a merged measure of attitudes.

Attitude certainty

As in Study 2, participants were randomly assigned to either a high or low certainty condition.

Elaboration

Before engaging in behaviour, participants were randomly assigned to either a high or low elaboration condition as in Study 2.

Dependent variables

Helping choice

A real programme called 'REFUGIO' designed to help Ukrainian students in Spain (https://ods. uam.es/uam-refugio/) was presented. After learning about this programme at their university, participants had the opportunity to enrol in it themselves. Their participation in the programme involved their acceptance of providing the necessary support to students who come from the conflict zone and helping them with their specific social inclusion process. Signing up for the programme involved accompanying these students during their first week at the campus, giving information regarding the services available at the university, and showing where the library, sports hall, cafeterias, etc. are located. We recorded whether participants fulfilled and signed the official form to join the REFUGIO programme. That variable was coded as 0 = No and 1 = Yes. About one-third of the students signed up to be part of this programme (33.60%). Promoting this kind of helping behaviour contributes to the inclusion in the society of refugees, but also could be beneficial to the 'help-performers' (Li & Xie, 2017).

Elaboration check

At the end of the study, participants completed one manipulation check to ensure the induction of elaboration created the intended pattern on the extent of thinking at the time of behaviour. Specifically,

participants had to answer a question about the extent of thinking about their behaviour using the scale: (1) *I did not think at all* (9) *I thought very much* (M=7.17; SD=2.43).

Results

Attitudes

Attitudes were submitted to a Certainty × Elaboration ANOVA. Results showed that attitudes did not vary as a function of certainty, F(1, 341) = 0.34, p = .562, or elaboration, F(1, 341) = 2.61, p = .107. The interaction term was not significant, F(1, 341) = 0.90, p = .344.

Elaboration check

Reported levels of elaboration at the time of behaviour were analysed using an independent samples *t*-test comparing low (-1) and high (1) elaboration conditions. Results revealed a significant difference in test scores between high elaboration (M=8.13, SD=2.67) and low elaboration (M=6.19, SD=1.68) conditions, t(342) = -8.10, p < .001.⁸

Certainty

To ensure that there was no failure of random assignment, the induction of certainty was submitted to a logistic binary regression analysis using attitudes (centred), elaboration (-1 = Low; 1 = High) and their interaction as predictor variables. Main effects were interpreted in the first step of the regression, and the two-way interaction in the final step. No effect reached significance ($ps \ge .348$).

Behaviour: Helping choice

Behaviour was submitted to a logistic binary regression analysis using attitudes (centred), certainty (-1 = Low; 1 = High), elaboration (-1 = Low; 1 = High) and all their interaction terms as predictor variables. Further details can be found in Tables S5 and S6.

Results revealed a main effect of attitudes on behaviour, b = 0.70, SE = 0.16, z = 4.49, p < .001, 95% CI: [0.40, 1.01], Cohen's $f^2 = .043$, such that more favourable attitudes were associated with more likelihood to enrol in the helping programme. No other main effect reached significance ($ps \ge .588$). The predicted two-way interaction between attitudes and certainty on behaviour, although non-significant, was in the predicted direction, b = 0.30, SE = 0.16, z = 1.86, p = .063, 95% CI: [-0.02, 0.61], Cohen's $f^2 = .007$. This pattern revealed that attitudes tended to be more associated with actual enrolment in the helping programme for participants assigned to the high certainty condition, b = 1.04, SE = 0.25, z = 4.11, p < .001, 95% CI: [0.55, 1.54], than for those assigned to the low certainty condition, b = 0.45, SE = 0.20, z = 2.30, p = .022, 95% CI: [0.07, 0.83]. The two-way interaction between attitudes and elaboration on behaviour was not significant, b = 0.00, SE = 0.16, z = -0.01, p = .996, 95% CI: [-0.31, 0.31], Cohen's $f^2 = .001$. The same occurred with the two-way interaction between certainty and elaboration on behaviour, b = 0.04, SE = 0.12, z = 0.36, p = .721, 95% CI: [-0.19, 0.27], Cohen's $f^2 = .001$.

⁸Reported elaboration was also submitted to a Certainty × Elaboration ANOVA. Results showed that elaboration induction was successful in manipulating elaboration, F(1, 340) = 65.25, p = .001. The certainty manipulation had no impact, F(1, 340) = 0.53, p = .466. The interaction term was not significant, F(1, 340) = 0.11, p = .742.





FIGURE 4 Behaviour as a function of attitudes and certainty when elaboration was high (top panel) and when elaboration was low (bottom panel).

Of critical importance, the expected three-way interaction between attitudes, certainty and elaboration on behaviour was significant, b=0.44, SE=0.18, z=2.49, p=.013, 95% CI: [0.09, 0.78], Cohen's $f^2=.015$. As illustrated in Figure 4, the three-way interaction showed that the moderation of certainty varied as a function of elaboration conditions. As predicted, the key interaction between attitudes and attitude certainty on behaviour emerged only for participants who were assigned to the high elaboration condition, b=0.81, SE=0.28, z=2.91, p=.004, 95% CI: [0.27, 1.35]. Specifically, more favourable attitudes were associated with greater behaviour for participants assigned to the high certainty condition, b=1.77, SE=0.49, z=3.61, p<.001, 95% CI: [0.09, 0.78]. For those assigned to the low certainty condition, the effect did not reach significance, b=0.16, SE=0.26, z=0.61, p=.541, 95% CI: [-0.35, 0.66]. The interaction between attitudes and certainty on

behaviour was not significant for participants who were assigned to the low elaboration condition, b = -0.07, SE = 0.22, z = -0.32, p = .748, 95% CI: [-0.50, 0.36].⁹

Discussion

This study revealed that attitudes towards Ukrainian refugees were more associated with helping behaviour (A–B consistency), as indicated by actual enrolment in a programme designed to help Ukrainian students at participants' university. Although non-significant in this study (p=.063), the results were also directionally consistent with the classic idea that greater attitude certainty is associated with more A–B consistency. Most importantly, Study 3 replicated the effect of elaboration on the use of metacognition. In line with SVT, we demonstrated that the effect of the already existing attitude certainty on A–B consistency occurred only when elaboration at the time of behaviour was high (vs. low). Finally, this finding suggests that interventions aiming to promote prosocial behaviours (such as helping refugees from Ukraine and from other countries) could benefit from considering attitude certainty and elaboration along with the often-studied relevant attitudes.

GENERAL DISCUSSION

The results of these studies supported four conclusions. Least surprising was that attitudes were a reliable and relevant predictor of behavioural outcomes. It is important to note that attitudes and behaviours were assessed in this research with regard to socially relevant topics, including prosocial actions towards Ukrainian refugees (Echterhoff et al., 2020, 2022). Second, consistent with prior research, some attitudes were better predictors than others. We replicated previous research on attitude strength showing that certainty in one's attitudes moderates the effects of those attitudes on behaviour (Fazio & Zanna, 1981; see Rucker et al., 2014; Tormala & Rucker, 2018, for reviews). This finding demonstrates that it is important to differentiate between merely holding attitudes and taking the strength (certainty) of those attitudes into consideration.

Third, we replicated prior research showing that the greater the elaboration, the greater the A–B consistency (Barden & Petty, 2008; Horcajo et al., 2019; Petty et al., 1983; Requero et al., 2020).¹⁰ The role of elaboration-related variables (e.g. personal relevance, involvement, importance, need for cognition) in the A–B link has been extensively investigated, particularly within the framework of dual-process models like the Elaboration Likelihood Model (ELM, Petty & Cacioppo, 1986) and the Heuristic-Systematic Model (HSM, Chaiken et al., 1989). Notably, the literature on the elaboration-strength link has focused on how elaboration moderates A–B consistency and other strength consequences, such as resistance to change. Specifically, prior research has examined how elaboration impacts processes and effects relevant to direct strength outcomes such as enhancing attitude certainty, which then renders the attitude more consequential. However, as discussed in greater detail below, the current research (particularly Studies 2 and 3) shifts the focus from how elaboration affects the experience/ formation of certainty to how elaboration influences the *use* of certainty.

Fourth, and most relevant, this research provided evidence for the SVT prediction about the conditions that are likely to enhance using metacognitive information (i.e. attitude certainty). Unlike prior research that primarily examined how elaboration directly affected certainty, which then moderated

 $^{^{9}}$ A significant main effect of attitudes on behaviour was found under low elaboration conditions, b = -0.70, SE = 0.22, z = 3.24, p = .001, 95% CI: [1.12, 0.27], showing that more favourable attitudes were associated with more likelihood to enrol in the helping program. This outcome indicates that the low elaboration induction did not eliminate the effect of all cognition in participants' heads. As predicted, it only eliminated the effect of attitude certainty, a metacognition, but not affect the impact of the initial cognition (i.e. participants attitudes) when predicting behaviour.

¹⁰Although Study 3 did not find the Attitude × Elaboration interaction, when the data were combined across studies, the Attitude × Elaboration interaction was significant. These results can be found in the Supporting Information.

A-B consistency, the current studies were the first to demonstrate that elaboration can also moderate the extent to which people consider (use) their attitude certainty even when the degree of certainty is not affected by elaboration. Results supported the SVT prediction that the use of certainty to moderate A-B consistency would be most apparent among those relatively high in their thinking at the time of the behavioural choice or action. Specifically, these studies showed that the effects of certainty on A-B consistency were more likely to occur for participants who chronically enjoy engaging in thinking (Study 1) and for those who were randomly assigned to high (vs. low) elaboration conditions (Study 2 and 3). Therefore, the current studies suggest that using certainty is especially likely when the person or situation fosters relatively high thinking at the time of behaviour. The present research provides empirical evidence in support of a distinction between two key metacognitive features-experience versus usage of attitude certainty-by directly manipulating the extent of thinking after inducing certainty. The current evidence goes beyond prior studies, which primarily focused on the role of thinkings on metacognitive processes in general (Efklides, 2006; Koriat, 2007; Nelson, 1990) or focused on the role of thinking on the first stage of experience (Tugtekin & Odabasi, 2022). Additionally, while prior SVT research and Study 1 provided ambiguous data regarding whether thinking affects the first stage of experience or the second stage of usage, Studies 2 and 3 clearly distinguished between these two metacognitive features (experience vs. usage of attitude certainty) empirically by manipulating the extent of thinking after inducing certainty, and therefore controlling (rather than simply measuring) that thinking is not influencing the experience of certainty. Thus, inducing elaboration after attitudes and certainty and just before behaviour to manipulate amount of thinking without affecting attitudes and certainty was a key innovation of the present research. Despite the differences in the two methodological approaches to deal with elaboration (individual differences in NC and a manipulation of personal relevance and mental load), the results showed convergent evidence for the extent of thinking. In one study, we assessed participants' NC, but in the other two, we manipulated motivation and ability, which are antecedents of thinking. Using these different operationalizations of elaboration is a strength of the present research.

Briefly, current studies are relevant for understanding the process by which attitudes guide behaviour. We already knew that people can retrieve their evaluation of an object (e.g. I like social media, I am in favour of integrating more refugees) before forming an intention to ultimately use the attitude (Fishbein & Ajzen, 1975). Furthermore, we also knew that people could consider how certain they are in their attitude before acting (Fazio & Zanna, 1981; Rucker et al., 2014; Tormala & Rucker, 2018). But there was no prior evidence examining when people are more likely to take that certainty into consideration. Because certainty in one's attitudes is so consequential, it becomes critical to understand when and for whom this metacognitive assessment is more likely to be taken into account. Studies 2 and 3 of the present research take a first step in identifying those conditions for the usage (rather than the experience) of certainty. In accordance with SVT, the present research demonstrates that this process of using attitude certainty is most likely to occur when people are engaged in considerable thinking at the time of their behaviour.

Limitations and future research

There are several potential limitations and avenues for future research. First, our Studies 2 and 3 involved the simultaneous manipulation of personal relevance (motivation) and mental load (capacity), two well-established determinants of elaboration. Although the combined use of these determinants aligns with prior research demonstrating their reliability as determinants of elaboration (Kredentser et al., 2012; Moreno et al., 2024; Tormala et al., 2002), future research could benefit from using a different operationalization of this key construct.

Second, while Study 3 relied on a dichotomous behavioural outcome to assess participants' helping behaviour, future research could benefit from examining a broader range of behavioural outcomes. This would enhance the generalizability of findings to other contexts and capture a broader range of responses. Nonetheless, it is worth noting that Studies 1 and 2 already employed alternative approaches

to assess behaviour, such as the number of coupons used for a new social app (Study 1) and participants' reported intentions to defend refugees' reception (Study 2). The diversity of these measures and the convergence of results across studies highlight the robustness of the present findings and represent a notable strength of this research.

Finally, we acknowledge that the effect sizes observed across our studies were modest. However, it is important to highlight that the main findings were consistently replicated across three studies employing diverse methodologies, ranging from correlational to experimental designs. These studies also utilized different operationalizations of key constructs and assessed their impact on varied outcomes. This convergence across methods strengthens the reliability and robustness of our findings, even in the face of modest effect sizes.

Practical implications

This research can also help in designing better interventions, capable of producing actual changes in behaviour. For example, the present research suggests that it may be possible to momentarily boost people's level of certainty to enhance the perceived validity of their attitudes, thereby increasing the impact of those attitudes on behaviour. As demonstrated, experimentally inducing perceptions of high certainty increased the effect of attitudes on behaviour. This supports the idea that people sometimes consult their attitudes and their certainty in that evaluation before acting (i.e. when thinking at the time of engaging in action is relatively high).

In addition, rather than being inherently beneficial, the present research has revealed that certainty can magnify whatever mental content is accessible. Therefore, for individuals who begin with favourable attitudes (e.g. 'I like helping others' or 'I am in favor of dedicating time and resources to those in need'), inducing certainty (by asking people to recall past experiences in which they felt confident, but also by other inductions, such as inducing happiness, self-affirmation, empowerment, etc.; see Briñol & Petty, 2022) offers benefits and can encourage desirable behaviours (e.g. making donations, helping other refugees; see Santos et al., 2023), especially under high thinking conditions. However, for individuals starting with unfavourable attitudes (e.g. 'I don't like wasting my time helping others' or 'I am against dedicating time and resources to those in need'), the present research reveals that inducing certainty can yield negative consequences (e.g. decreasing helping behaviour), especially under highthinking conditions. Consequently, understanding the underlying processes is the key to specifying why, when, and for whom these practical initiatives are more likely to work or to backfire (Briñol & Petty, 2024). In conclusion, potential prosocial interventions should consider that it is important not only to differentiate between merely holding a prosocial attitude and the validity of that mental content (i.e. attitude certainty), but also to consider the likelihood of taking that perceived validity into consideration. That is, interventions designed to promote desired prosocial behaviours could benefit from the results of this research. As shown, people's prosocial behaviour could be increased by taking the direction of initial cognitions into consideration (in this case, favourable or unfavourable attitudes) along with certainty and elaboration.

Implications for other metacognitive experiences

This work focuses on attitude certainty, but similar predictions could apply to other metacognitive experiences like perceived ease of attitude retrieval. Traditional research suggests that ease often shapes judgements and behaviours through just one single process (such as serving as simple cue or operating as an availability heuristic; see Alter & Oppenheimer, 2009; Schwarz, Jalbert, et al., 2020; Schwarz, 2020, for reviews). Unlike these traditional approaches, the present conceptualization highlights that ease (and other metacognitive variables) can operate through multiple processes depending on moderating variables in accord with the ELM (Petty & Cacioppo, 1986).

In the original study of ease of retrieval, Schwarz et al. (1991) asked participants to list either six examples of their own assertiveness (which was easy to do) or 12 examples (which was difficult). People who had to retrieve fewer examples viewed themselves as *more* assertive, despite having fewer examples on which to base this judgement. Schwarz and colleagues reasoned that people considered the ease with which the thoughts could be retrieved from memory and inferred that if retrieval was easy, many more examples were likely to be available. Because of this availability heuristic (Tversky & Kahneman, 1973), generating two reasons in favour of something can lead to more positive attitudes than generating eight. Furthermore, because the ease effect is presumed to be mediated by use of a heuristic, the ease effect was originally argued to be more likely when people were not thinking very much (Chaiken et al., 1989; Petty & Cacioppo, 1986). Consistent with this view, other work on fluency has similarly focused on how ease can influence judgement through other simple processes such as classical conditioning that are likely to operate under low thinking (Unkelbach, 2007; Winkielman & Cacioppo, 2001).

The SVT approach to ease differs from the traditional interpretation. Instead of assuming that ease invariably works via a heuristic process or through another low thinking process (like classical conditioning), SVT suggests that easily generated thoughts can have greater impact because people infer greater validity. That is, thoughts that come to mind easily are more likely to be assumed to be valid (Tormala et al., 2007). For example, in an initial study explicitly using SVT to explain ease effects, Tormala et al. (2002) found that when it was easy to generate positive thoughts about a policy, participants were more confident in the validity of those specific thoughts. Moreover, thought confidence mediated the effect of the ease manipulation on attitudes towards the policy, whereas the perceived number of supportive thoughts did not (see Briñol et al., 2013, for a review).

In addition to specifying that a different mechanism can underlie ease effects compared with what was originally proposed, SVT assumes that because a metacognitive inference of validity is involved, the ease effect should be magnified under *high* rather than low levels of thinking (SVT Postulate 4, Briñol & Petty, 2022). Thus, SVT points to a different mediator and different moderation than the original ease of retrieval theory. This does not mean that the initial interpretation of ease effects (Schwarz et al., 1991) was wrong. Rather, in a series of studies examining both mediation and moderation of ease effects, it was found that the ease effect was mediated by perceived thought validity rather than the availability heuristic only when thinking was set to be high (Tormala et al., 2002, 2007; see also Clarkson et al., 2011; Gandarillas et al., 2018; Walter & Cohen, 2019). Therefore, ease can play multiple roles depending on the circumstances, such as serving as a heuristic under low thinking conditions, validating thoughts under more thoughtful situations, etc. (see, Briñol et al., 2013, for a review).

AUTHOR CONTRIBUTIONS

Lorena Moreno: Writing – original draft; writing – review and editing; methodology. Pablo Briñol: Conceptualization; investigation; funding acquisition; writing – review and editing; supervision; methodology. Richard E. Petty: Conceptualization; supervision; funding acquisition; writing - review and editing.

ACKNOWLEDGEMENTS

This work was supported by the Ministerio de Ciencia e Innovación in Spain under Grants PID2020-116651GB-C31 and PID2023-148146NB-100 to Pablo Briñol; and by the Templeton World Charity Foundation under Grant TWCF-2023-32571 to Richard Petty.

CONFLICT OF INTEREST STATEMENT

We have no known conflict of interest to disclose.

DATA AVAILABILITY STATEMENT

Data and materials can be found on our OSF page (https://osf.io/vcw5q/). All relevant measures and manipulations in these studies are reported.

ETHICAL APPROVAL

Research was conducted in accordance with APA guidelines on the ethical treatment of human subjects. Permission to conduct this research was provided by the university institutional ethics committee before the studies began [UAM-CEI 104-2009; 31/01/2022].

ORCID

Lorena Moreno b https://orcid.org/0000-0003-4829-7280 Pablo Briñol b https://orcid.org/0000-0002-0327-5865 Richard E. Petty b https://orcid.org/0000-0002-2870-8575

REFERENCES

- Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. Psychological Bulletin, 84(5), 888–918. https://doi.org/10.1037/0033-2909.84.5.888
- Alter, A. L., & Oppenheimer, D. M. (2009). Uniting the tribes of fluency to form a metacognitive nation. Personality and Social Psychology Review, 13(3), 219–235. https://doi.org/10.1177/1088868309341564
- 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. https://doi.org/10.1037/a0012559
- Berger, I. E., & Mitchell, A. A. (1989). The effect of advertising on attitude accessibility, attitude confidence, and the attitudebehavior relationship. *Journal of Consumer Research*, 16(3), 269–279. https://doi.org/10.1086/209213
- Bizer, G. Y., Krosnick, J. A., Petty, R. E., & Rucker, D. D. (2000). Need for cognition and need to evaluate in the 1998 national election survey pilot study.
- Blankenship, K. L., & Wegener, D. T. (2008). Opening the mind to close it: Considering a message in light of important values increases message processing and later resistance to change. *Journal of Personality and Social Psychology*, 94(2), 196–213. https://doi.org/10.1037/0022-3514.94.2.94.2.196
- Bleske-Rechek, A., Nelson, L. A., Baker, J. P., Remiker, M. W., & Brandt, S. J. (2010). Evolution and the trolley problem: People save five over one unless the one is young, genetically related, or a romantic partner. *Journal of Social, Evolutionary, and Cultural Psychology*, 4(3), 115–127. https://doi.org/10.1037/h0099295
- Böckler, A., Tusche, A., & Singer, T. (2016). The structure of human prosociality: Differentiating altruistically motivated, norm motivated, strategically motivated, and self-reported prosocial behavior. *Social Psychological and Personality Science*, 7(6), 530–541. https://doi.org/10.1177/1948550616639650
- Briñol, P., Barden, J., & Petty, R. E. (2007). Happiness versus sadness as a determinant of thought confidence in persuasion: A self-validation analysis. *Journal of Personality and Social Psychology*, 93(5), 711–727. https://doi.org/10.1037/0022-3514. 93.5.711
- Briñol, P., & Petty, R. E. (2022). Self-validation theory: An integrative framework for understanding when thoughts become consequential. *Psychological Review*, 129(2), 340–367. https://doi.org/10.1037/rev0000340
- Briñol, P., & Petty, R. E. (2024). Fundamental processes of positive change. European Review of Social Psychology, 1–38. https://doi. org/10.1080/10463283.2024.2424146
- Briñol, P., Petty, R. E., & Tormala, Z. L. (2004). Self-validation of cognitive responses to advertisements. Journal of Consumer Research, 30(4), 559–573. https://doi.org/10.1086/380289
- Briñol, P., Tormala, Z. L., & Petty, R. E. (2013). Ease and persuasion: Multiple processes, meanings, and effects. In C. Unkelbach & R. Greifeneder (Eds.), The experience of thinking: How the fluency of mental processes influences cognition and behaviour (pp. 101–118). Psychology Press.
- 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(6), 1040–1053. https://doi.org/10.1037/ 0022-3514.93.6.1040
- Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. Journal of Personality and Social Psychology, 42, 116–131. https://doi. org/10.1037/0022-3514.42.1.116
- Cacioppo, J. T., & Petty, R. E. (1989). Effects of message repetition on argument processing, recall, and persuasion. Basic and Applied Social Psychology, 10(1), 3–12. https://doi.org/10.1207/s15324834basp1001_2
- Cacioppo, J. T., Petty, R. E., Feinstein, J., & Jarvis, W. B. G. (1996). Dispositional differences in cognitive motivation: The life and times of individuals varying in need for cognition. *Psychological Bulletin*, 119(2), 197–253. https://doi.org/10.1037/0033-2909.119.2.197
- Chaiken, S., Liberman, A., & Eagly, A. H. (1989). Heuristic and systematic processing within and beyond the persuasion context. In J. S. Uleman & J. A. Bargh (Eds.), Unintended thought (pp. 212–252). Guilford Press.
- Clark, J. K., Evans, A. T., & Wegener, D. T. (2011). Perceptions of source efficacy and persuasion: Multiple mechanisms for source effects on attitudes. *European Journal of Social Psychology*, 41(5), 596–607. https://doi.org/10.1002/ejsp.787
- Clark, J. K., & Thiem, K. C. (2015). Group communicators, perceived entitativity, and persuasion: A self-validation analysis. Journal of Experimental Social Psychology, 61(1), 5–11. https://doi.org/10.1016/j.jesp.2015.06.005

- Clarkson, J. J., Tormala, Z. L., & Leone, C. (2011). A self-validation perspective on the mere thought effect. Journal of Experimental Social Psychology, 47(2), 449–454. https://doi.org/10.1016/j.jesp.2010.12.003
- 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(4), 810–825. https://doi.org/10.1037/a0013192

Cohen, J., & Cohen, P. (1983). Applied multiple regression/correlation analysis for the behavior sciences (2nd ed.). Erlbaum.

- Crites, S. L., Fabrigar, L. R., & Petty, R. E. (1994). Measuring the affective and cognitive properties of attitudes: Conceptual and methodological issues. *Personality and Social Psychology Bulletin*, 20(6), 619–634. https://doi.org/10.1177/0146167294206001
- DeMarree, K. G., Petty, R. E., Briñol, P., & Xia, J. (2020). Documenting individual differences in the propensity to hold attitudes with certainty. *Journal of Personality and Social Psychology*, 119, 1239–1265. https://doi.org/10.1037/pspa0000241
- Dunlosky, J., & Metcalfe, J. (2008). Metacognition. Sage Publications.
- Echterhoff, G., Becker, J. C., Knausenberger, J., & Hellmann, J. H. (2022). Helping in the context of refugee immigration. *Current Opinion in Psychology*, 44, 106–111. https://doi.org/10.1016/j.copsyc.2021.08.035
- Echterhoff, G., Hellmann, J. H., Back, M. D., Kärtner, J., Morina, N., & Hertel, G. (2020). Psychological antecedents of refugee integration (PARI). Perspectives on Psychological Science, 15(4), 856–879. https://doi.org/10.1177/1745691619898838
- Efklides, A. (2006). Metacognitive experiences: The missing link in the self-regulated learning process. Educational Psychology Review, 18, 287-291. https://doi.org/10.1007/s10648-006-9021-4
- Ekinci, S., & Van Lange, P. A. M. (2023). Lost in between crises: How do COVID-19 threats influence the motivation to act against climate change and the refugee crisis? *Journal of Environmental Psychology*, 85, 10198. https://doi.org/10.1016/j.jenvp. 2022.101918
- Fazio, R. H. (1990). Multiple processes by which attitudes guide behavior: The MODE model as an integrative framework. In M. P. Zanna (Ed.), Advances in experimental social psychology (Vol. 23, pp. 75–109). Academic Press.
- Fazio, R. H., & Zanna, M. P. (1978). On the predictive validity of attitudes: The roles of direct experience and confidence. *Journal of Personality*, 46(2), 228–243. https://doi.org/10.1111/j.1467-6494.1978.tb00177.x
- Fazio, R. H., & Zanna, M. P. (1981). Direct experience and attitude-behavior consistency. Advances in Experimental Social Psychology, 14, 161–202. https://doi.org/10.1016/s0065-2601(08)60372-x
- Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention, and behavior: An introduction to theory and research. Addison-Wesley.
- Fishbein, M., & Ajzen, I. (2010). Predicting and changing behavior: The reasoned action approach. Psychology Press.
- Gandarillas, B., Briñol, P., Petty, R. E., & Díaz, D. (2018). Attitude change as a function of the number of words in which thoughts are expressed. *Journal of Experimental Social Psychology*, 74, 196–211. https://doi.org/10.1016/j.jesp.2017.09.012
- 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). Lawrence Erlbaum Associates.
- Horcajo, J., Briñol, P., & Petty, R. E. (2014). Multiple roles for majority versus minority source status on persuasion: When source status follows the message. *Social Influence*, 9(1), 37–51. https://doi.org/10.1080/15534510.2012.743485
- Horcajo, J., Santos, D., Guyer, J. J., & Moreno, L. (2019). Changing attitudes and intentions related to doping: An analysis of individual differences in need for cognition. *Journal of Sports Sciences*, 37, 2835–2843. https://doi.org/10.1080/02640414. 2019.1665876
- Koriat, A. (2007). Metacognition and consciousness. In P. D. Zelazo, M. Moscovitch, & E. Thompson (Eds.), The Cambridge handbook of consciousness (pp. 289-325). Cambridge University Press.
- Kredentser, M. S., Fabrigar, L. R., Smith, S. M., & Fulton, K. (2012). Following what people think we should do versus what people actually do: Elaboration as a moderator of the impact of descriptive and injunctive norms. *Social Psychological and Personality Science*, 3(3), 341–347. https://doi.org/10.1177/1948550611420481
- Krishnan, H. S., & Smith, R. E. (1998). The relative endurance of attitudes, confidence, and attitude-behavior consistency: The role of information source and delay. *Journal of Consumer Psychology*, 7(3), 273–298. https://doi.org/10.1207/s15327663j cp0703_03
- Krosnick, J. A., & Petty, R. E. (1995). Attitude strength: An overview. In R. E. Petty & J. A. Krosnick (Eds.), Attitude strength: Antecedents and consequences (pp. 1–24). Erlbaum Associates.
- Li, X., & Xie, X. (2017). The helping behavior helps lighten physical burden. Basic and Applied Social Psychology, 39(4), 183–192. https://doi.org/10.1080/01973533.2017.1320762
- Luttrell, A., & Sawicki, V. (2020). Attitude strength: Distinguishing predictors versus defining features. Social and Personality Psychology Compass, 14(8), e12555. https://doi.org/10.1111/spc3.12555
- Luttrell, A. L., Erdem, E., & Petty, R. E. (2016). The influence of moral convictions on attitude strength and persuasion. Social and Personality Psychology Compass, 10(3), 154–170. https://doi.org/10.1111/spc3.12249
- McGuire, W. J. (1985). Attitudes and attitude change. In G. Lindzey & E. Aronson (Eds.), *Handbook of social psychology* (Vol. 2, 3rd ed., pp. 233–346). Random House.
- Moreno, L., Briñol, P., & Petty, R. E. (2022). Metacognitive confidence can increase but also decrease performance in academic settings. *Metacognition and Learning*, 17, 139–165. https://doi.org/10.1007/s11409-021-09270-y
- Moreno, L., Briñol, P., & Petty, R. E. (2024). Scientific identity and STEMM-relevant outcomes: Elaboration moderates use of identity-certainty. Journal of Experimental Social Psychology, 115, 104663. https://doi.org/10.1016/j.jesp.2024.104663
- Moreno, L., Requero, B., Santos, D., Paredes, B., Briñol, P., & Petty, R. E. (2021). Attitudes and attitude certainty guiding prosocial behavior as a function of perceived elaboration. *European Journal of Social Psychology*, 51(6), 990–1006. https://doi.org/ 10.1002/ejsp.2798

Morwitz, V. G., & Munz, K. P. (2020). Intentions. Consumer Psychology Review, 4(1), 26-41. https://doi.org/10.1002/arcp.1061

- Nelson, T. O. (1990). Metamemory: A theoretical framework and new findings. Psychology of Learning and Motivation, 26, 125–173. https://doi.org/10.1016/S0079-7421(08)60053-5
- Noah, T., Schul, Y., & Mayo, R. (2018). Thinking of oneself as an object of observation reduces reliance on metacognitive information. Journal of Experimental Psychology: General, 147(7), 1023–1042. https://doi.org/10.1037/xgc0000440
- Norman, E., Pfuhl, G., Sæle, R. G., Svartdal, F., Låg, T., & Dahl, T. I. (2019). Metacognition in psychology. Review of General Psychology, 23(4), 403–424. https://doi.org/10.1177/1089268019883821
- Paredes, B., Briñol, P., Cuesta, U., Martinez, L., Petty, R. E., & Moreno, L. (2021). The role of meta-cognitive certainty on pornography consumption. *Psicothema*, 33(3), 442–448. https://doi.org/10.7334/psicothema2021.8
- Petty, R. E., Briñol, P., Fabrigar, L. R., & Wegener, D. T. (2019). Attitude structure and change. In E. J. Finkel & R. F. Baumeister (Eds.), Advanced social psychology: The state of the science (2nd ed., pp. 117–156). Oxford University Press.
- Petty, R. E., Briñol, P., Loersch, C., & McCaslin, M. J. (2009). The need for cognition. In M. R. Leary & R. H. Hoyle (Eds.), Handbook of individual differences in social behavior (pp. 318–329). Guilford Press.
- Petty, R. E., Briñol, P., & Tormala, Z. L. (2002). Thought confidence as a determinant of persuasion: The self-validation hypothesis. Journal of Personality and Social Psychology, 82(5), 722–741. https://doi.org/10.1037/0022-3514.82.5.722
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In L. Berkowitz (Ed.), Advances in experimental social psychology (Vol. 19, pp. 123–205). Academic Press. https://doi.org/10.1016/S0065-2601(08)60214-1
- Petty, R. E., & Cacioppo, J. T. (1990). Involvement and persuasion: Tradition versus integration. Psychological Bulletin, 107(3), 367–374. https://doi.org/10.1037/0033-2909.107.3.367
- Petty, R. E., Cacioppo, J. T., & Goldman, R. (1981). Personal involvement as a determinant of argument-based persuasion. Journal of Personality and Social Psychology, 41(5), 847–855. https://doi.org/10.1037/0022-3514.41.5.847
- Petty, R. E., Cacioppo, J. T., & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research*, 10, 135–146. https://doi.org/10.1086/208954
- Petty, R. E., & Krosnick, J. A. (Eds.). (1995). Attitude strength: Antecedents and consequences. Erlbaum Associates. https://doi.org/ 10.4324/9781315807041
- Pfattheicher, S., Nielsen, Y. A., & Thielmann, I. (2022). Prosocial behavior and altruism: A review of concepts and definitions. *Current Opinion in Psychology*, 44, 124–129. https://doi.org/10.1016/j.copsyc.2021.08.021
- Pierro, A., Mannetti, L., Kruglanski, A. W., Klein, K., & Orehek, E. (2012). Persistence of attitude change and attitude–behavior correspondence based on extensive processing of source information. *European Journal of Social Psychology*, 42, 103–111. https://doi.org/10.1002/ejsp.853
- Ratneshwar, S., & Chaiken, S. (1991). Comprehension's role in persuasion: The case of its moderating effect on the persuasive impact of source cues. Journal of Consumer Research, 18(1), 52. https://doi.org/10.1086/209240
- Requero, B., Briñol, P., Moreno, L., Paredes, B., & Gandarillas, B. (2020). Promoting healthy eating by enhancing the correspondence between attitudes and behavioral intentions. *Psicothema*, 32(1), 60–66. https://doi.org/10.7334/psicothema2019.154
- Rucker, D. D., & Petty, R. E. (2004). When resistance is futile: Consequences of failed counterarguing for attitude certainty. *Journal of Personality and Social Psychology*, 86(2), 219–235. https://doi.org/10.1037/0022-3514.86.2.219
- Rucker, D. D., Tormala, Z. L., Petty, R. E., & Briñol, P. (2014). Consumer conviction and commitment: An appraisal-based framework for attitude certainty. *Journal of Consumer Psychology*, 24(1), 119–136. https://doi.org/10.1016/j.jcps.2013.07.00
- 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(2), 137–149. https://doi.org/10.1016/j. jcps.2008.01.008
- Santos, D., Martínez, R., Briñol, P., & Petty, R. E. (2023). Improving attitudes toward minority groups by thinking about the thoughts and metacognitions of their members. *European Journal of Social Psychology*, 53(3), 552–566. https://doi.org/10. 1002/ejsp.2922
- Schwarz, N., Bless, H., Strack, F., Klumpp, G., Rittenauer-Schatka, H., & Simons, A. (1991). Ease of retrieval as information: Another look at the availability heuristic. *Journal of Personality and Social Psychology*, 61(2), 195–202. https://doi.org/10.1037/ 0022-3514.61.2.195
- Schwarz, N., & Clore, G. L. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. *Journal of Personality and Social Psychology*, 45(3), 513–523. https://doi.org/10.1037/0022-3514.45.3.513
- Schwarz, N., Jalbert, M., Noah, T., & Zhang, L. (2020). Metacognitive experiences as information: Processing fluency in consumer judgment and decision making. *Consumer Psychology Review*, 4, 4–25. https://doi.org/10.1002/arcp.1067
- Schwarz, N., Newman, E., & Leach, W. (2020). Making the truth stick and the myths fade: Lessons from cognitive psychology. Behavioral Science & Policy, 6(1), 85–95.
- Strack, F., Schwarz, N., & Schneidinger, E. (1985). Happiness and reminiscing: The role of time perspective, affect, and mode of thinking. *Journal of Personality and Social Psychology*, 49(6), 1460–1469. https://doi.org/10.1037/0022-3514.49.6.1460
- Tian, Y. (2011). Communication behaviors as mediators: Examining links between political orientation, political communication, and political participation. *Communication Quarterly*, 59(3), 380–394. https://doi.org/10.1080/01463373.2011.583503
- 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(12), 1700–1712. https://doi.org/10.1177/014616702237651
- Tormala, Z. L., Briñol, P., & Petty, R. E. (2006). When credibility attacks: The reverse impact of source credibility on persuasion. Journal of Experimental Social Psychology, 42, 684–691. https://doi.org/10.1016/j.jesp.2005.10.005

- Tormala, Z. L., Briñol, P., & Petty, R. E. (2007). Multiple roles for source credibility under high elaboration: It's all in the timing. Social Cognition, 25(4), 536–552. https://doi.org/10.1521/soco.2007.25.4.536
- Tormala, Z. L., & Petty, R. E. (2004). Source credibility and attitude certainty: A metacognitive analysis of resistance to persuasion. Journal of Consumer Psychology, 14(4), 427–442. https://doi.org/10.1207/s15327663jcp1404_11
- Tormala, Z. L., & Rucker, D. D. (2018). Attitude certainty: Antecedents, consequences, and new directions. Consumer Psychology Review, 1, 72–89. https://doi.org/10.1002/arcp.1004
- Tugtekin, U., & Odabasi, H. F. (2022). Do interactive learning environments have an effect on learning outcomes, cognitive load and metacognitive judgments? *Education and Information Technologies*, 27, 7019–7058. https://doi.org/10.1007/s10639-022-10912-0
- Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. Cognitive Psychology, 5(2), 207–232. https://doi.org/10.1016/0010-0285(73)90033-9
- Unkelbach, C. (2007). Reversing the truth effect: Learning the interpretation of processing fluency in judgments of truth. Journal of Experimental Psychology: Learning, Memory, and Cognition, 33(1), 219–230. https://doi.org/10.1037/0278-7393.33.1.219
- Valenzuela, S., Bachmann, I., & Aguilar, M. (2019). Socialized for news media use: How family communication, informationprocessing needs, and gratifications determine adolescents' exposure to news. *Communication Research*, 46(8), 1095–1118. https://doi.org/10.1177/0093650215623833
- Van Zomeren, M., Postmes, T., & Spears, R. (2008). Toward an integrative social identity model of collective action: A quantitative research synthesis of three socio-psychological perspectives. *Psychological Bulletin*, 134, 504–535. https://doi.org/10. 1037/0033-2909.134.4.504
- Verkuyten, M., Altabatabaei, H. G., & Nooitgedagt, W. (2018). Supporting the accommodation of voluntary and involuntary migrants. Social Psychological and Personality Science, 9(3), 267–274. https://doi.org/10.1177/1948550617737600
- Walter, N., & Cohen, J. (2019). When less is more and more is less: The paradoxical metacognitive effects of counterarguing. Communication Monographs, 86, 377–397. https://doi.org/10.1080/03637751.2019.1580378
- Webb, T. L., & Sheeran, P. (2006). Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological Bulletin*, 132(2), 249–268. https://doi.org/10.1037/0033-2909.132.2.249
- Winkielman, P., & Cacioppo, J. T. (2001). Mind at ease puts a smile on the face: Psychophysiological evidence that processing facilitation elicits positive affect. *Journal of Personality and Social Psychology*, 81(6), 989–1000. https://doi.org/10.1037/0022-3514.81.6.989
- Wood, W., Rhodes, N., & Biek, M. (1995). Working knowledge and attitude strength: An information-processing analysis. In R. E. Petty & J. A. Krosnick (Eds.), Attitude strength: Antecedents and consequences (pp. 283–313). Lawrence Erlbaum Associates.
- Yahalom, N., & Schul, Y. (2013). How thinking about the other affects our reliance on cognitive feelings of ease and effort: Immediate discounting and delayed utilization. *Social Cognition*, 31(1), 31–56. https://doi.org/10.1521/soco.2013.31.1.31
- Yitmen, Ş., & Verkuyten, M. (2018). Positive and negative behavioural intentions towards refugees in Turkey: The roles of national identification, threat, and humanitarian concern. *Journal of Community and Applied Social Psychology*, 28, 230–243. https://doi.org/10.1002/casp.2354

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Moreno, L., Briñol, P., & Petty, R. E. (2025). Elaboration moderates reliance on metacognitive assessments: The case of attitude certainty. *British Journal of Social Psychology*, *64*, e12902. <u>https://doi.org/10.1111/bjso.12902</u>