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Strengthening personalized matching by targeting persuasive messages to strong traits of the recipient

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ABSTRACT

Personalized matching is important because matching some aspect of a persuasive message to the recipient can affect the degree of attitude change. In the present review, we discuss how researchers and practitioners can benefit from considering insights from the literature on attitude strength and meta-cognition to improve the persuasive impact of personally matched appeals. After describing this general framework, we summarize a growing body of recently published research showing that the extent to which people hold their traits (and any aspect of the self) with confidence can improve the predictive ability of those traits to guide a wide range of judgments and behaviors. Next, we cover a selection of illustrative, new studies showing that person-situation matches can be strengthened by taking certainty and other meta-cognitive perceptions into account. Then, we discuss avenues for future research, including how confidence in individual differences also can matter for persuasion when people generate messages that match their own personalities. We conclude by noting how considerations of confidence can be applied beyond individual differences to other aspects of the persuasion context.

The *personalized matching* effect in persuasion refers to a strategy in which some aspect of a persuasive message (i.e. its source, arguments, framing, or the setting in which it is delivered) is congruent with (i.e. matched to) some aspect of the person receiving that message (e.g. the person's gender, personality, identity, etc.). This technique is also commonly known as tailoring, targeting, and segmenting and it comprises a robust and growing literature (Petty et al., 2025; Teeny et al., 2021). In the present review, we discuss how researchers and practitioners can benefit from considering insights from the attitude strength literature, especially that on meta-cognition, to enhance prediction of the persuasive impact of personally matched appeals.

As we discuss shortly, personalized matching is important because matching some aspect of an individual to one or more aspects of the message can affect the extent of persuasion. Matching a feature of persuasion to a person is typically appraised positively by that person, often leading to more favorable attitudes than mismatching. However, the meaning of matching (positive or negative), the process by which it works, and its outcome can vary (see Briñol & Petty, 2025).

In one classic illustration of matching (Snyder & DeBono, 1985), persuasive messages were made more effective by aligning their content with the functional basis of people's attitudes. Individual differences in self-monitoring were assessed as a proxy for an attitude's functions. The core result from this research was that high self-monitors (oriented toward social approval, Snyder, 1979) were more influenced by a message focused on the image afforded by a product rather than its quality, whereas low self-monitors (motivated to be consistent with their internal beliefs and values) showed the reverse pattern. That is, each group favored the messaged aligned with their personality (see Joyal-Desmarais et al., 2025, for a review of functional matching effects).

Another classic approach to matching involves whether a person's attitudes are based more on emotion or on cognition (Zanna & Rempel, 1988). In this domain, research indicates that it is generally more

effective to change attitudes that are based on emotion with emotional persuasive messages rather than with more cognitive or rational ones, with the reverse tending to hold for attitudes based primarily on cognition (Edwards, 1990; Fabrigar & Petty, 1999; see Aquino et al., 2025, for more on affective-cognitive matching).

Beyond these illustrative examples of matching messages to attitude functions and bases, research has identified a wide array of other variables and characteristics within a recipient to which a message can be matched (see Petty et al., 2025, and Teeny et al., 2021, for comprehensive reviews). Rather than broadly summarizing that growing literature, we focus specifically on offering novel suggestions both conceptually and methodologically for enhancing the prediction of the persuasive effect of various kinds of personalized matches. Our proposal for strengthening matching is based on the literature of attitude strength, especially attitude certainty, which we briefly summarize next.

Improving the predictive validity of attitudes

Attitudes refer to the general and relatively enduring evaluations (e.g. good-bad) people have of other people, objects, or ideas (Petty et al., 2019), but some attitudes are more consequential than others. Attitude strength refers to the extent to which attitudes are durable (e.g. resistant to change) and impactful (e.g. predictive of behavior; Petty & Krosnick, 1995). The strength of an attitude can be assessed with a variety of indicators. For instance, attitudes tend to predict behavior better when they are relatively high in certainty, accessibility, structural consistency, knowledge, elaboration, and importance (see Luttrell & Sawicki, 2020; Petty & Krosnick, 1995, for reviews). Still other dimensions that are gaining traction as strength properties include whether the attitude is based on one's morals (Skitka et al., 2021), is self-defining (Zunick et al., 2017), or linked to one's identity (Xu & Petty, 2024).

Perhaps the most studied indicator of strong attitudes is how *certain* people are that their attitude is the correct one to have (Rucker et al., 2014). Attitude certainty (or confidence) is a dimension of attitude strength that refers to a sense of validity concerning an attitude (e.g. Gross et al., 1995). Thus, attitude certainty reflects a meta-cognitive assessment (i.e. 'Is my evaluation valid?') about an initial cognition (i.e. the attitude itself).

In a recent illustration of the importance of attitude certainty in affecting an attitude's ability to guide behavior, Moreno et al. (2021) examined attitude-behavior consistency (ABC) in the context of helping others. In one study, college undergraduates were asked to report their attitudes toward instituting comprehensive exams in their major before they would be able to graduate as well as their certainty in those attitudes. At the end of the study, participants were given the opportunity to enroll in a mentoring program designed to help other students prepare for these exams. This study revealed that more positive attitudes toward the exams were associated with more prosocial behavior, as indicated by participants' actual enrollment in the mentoring program related to exams. Most relevant for the present concerns, the study also showed that greater attitude certainty was associated with even greater ABC.

These effects of attitude certainty have also been found in research manipulating (rather than measuring) it. In an early study, Fazio and Zanna (1978) randomly assigned participants to either work on or to just read about several puzzles. This manipulation of *direct experience* (working on puzzles) versus *indirect experience* (reading about them) was designed to influence attitude certainty, such that more attitude confidence is generated from direct experience. Along with examining the impact of this manipulation on confidence, participants' attitudes toward the puzzles and subsequent behavior relevant to those attitudes were assessed. The results showed that attitudes were more predictive of behavior under conditions of high (direct experience) rather than low (indirect experience) confidence. In sum, attitudes held with higher certainty are typically more likely to guide behavior regardless of whether certainty is measured or manipulated (see also Berger & Mitchell, 1989; Rucker & Petty, 2004; Tormala & Petty, 2004).

As these examples illustrate, initial conceptualizations of attitude certainty focused on how it often stemmed from variables that were structurally linked to the attitude, such as whether the attitude was based on direct experience (Fazio & Zanna, 1978), or how much issue-relevant knowledge was behind the attitude (Wood et al., 1995), and to what extent the attitude resulted from high rather than low amounts of thinking (Petty & Cacioppo, 1986). Importantly, attitude certainty can also develop in the absence of any of these structural differences. For example, research has demonstrated that simply

leading people to believe (e.g. through bogus feedback) that their attitudes are based on considerable thought (Barden & Petty, 2008; Moreno et al., 2021) or on two-sided information (Rucker et al., 2008), or on morality (Luttrell et al., 2016; Skitka et al., 2021) can enhance attitude certainty and render the attitudes more consequential. Indeed, there is an emerging body of work highlighting the importance of perceived attitude qualities irrespective of their objectively measured counterparts in producing durable and impactful attitudes (Petty et al., 2023).

Just as attitudes held with confidence are more predictive of behavior, we argue that other mental constructs (including traits) are also more predictive of their intended outcomes when people have more confidence in them (Briñol & Petty, 2022). As we describe next, the extent to which people hold their individual traits and characteristics with confidence can improve the predictive ability of those traits in guiding a wide variety of trait-relevant judgments and behaviors. After reviewing the evidence for this, we turn to how this research has important implications for strengthening personalized matching effects in persuasion.

The studies described in this illustrative review were selected based on a number of factors. First, in all the studies that will be covered, an initial individual difference variable was first assessed using a standard inventory. Second, a measure or a manipulation of the certainty with which those initial responses to the individual difference measures were held was also included. Third, the impact of those two variables (traits and certainty) was examined with regard to consequences relevant to the initial trait assessed, including trait-consistent behaviors and judgments, and responses to personalized messages. The studies that met this criterion came from our own research rather than from a formal, systematic literature search, and were included primarily for illustrative purposes to show the wide variety of individual differences for which these effects hold. Nonetheless, given the novelty of this approach to matching, we suspect that there are few if any other studies available.

Improving the predictive validity of recipient variables

Personalizing persuasion attempts to match recipients requires that researchers and practitioners assess the target of influence with reliable and valid instruments. In general, individual differences relevant to the recipient of persuasion are typically measured by using standardized inventories in which people are asked to directly report their self-views (e.g. rate the extent to which you 'have many more opinions than the average person', Jarvis & Petty, 1996). Just as attitudes (self-ratings of one's overall evaluations) vary in their ability to predict behavior, individual differences also vary in the extent to which they guide actions.

As noted earlier with respect to attitudes, assessing the confidence with which people hold their attitudes has proven useful in enhancing the ability of those attitudes to predict behavior. Consistent with this work, recent research has shown that many personality inventories are also more predictive of their intended outcomes when people report more confidence in their responses to the relevant individual differences scale (Shoots-Reinhard et al., 2015; Wichman et al., 2010). Table 1 provides a summary of the wide variety of individual difference variables for which certainty in the scale measure has enhanced the predictive ability of the scale. These findings are consistent with the more general notion from self-validation theory (Briñol & Petty, 2022) that *any* mental content becomes more consequential (e.g. more predictive of judgment and behavior) when individuals have more confidence in that mental content.

These perceptions of confidence (i.e. how valid people consider their mental contents to be) can be assessed easily by asking people to rate the certainty they have in their responses to any psychological inventory. As we describe shortly, confidence can not only be measured but also can be manipulated with multiple procedures, including incidental inductions unrelated to the initial dimension examined with the personality inventory. Regardless of whether confidence is measured or manipulated, perceptions of validity are highly useful in moderating the effects of individual differences inventories in many domains beyond personality traits, ranging from political ideology (Vitriol et al., 2019) to scientific identity (Moreno et al., 2024; see Table 1).

In one illustrative study, Santos et al. (2019) examined whether a person's certainty in their responses to an aggressiveness scale could enhance the scale's ability to predict relevant aggressive behavior.

Table 1. List of illustrative studies in which confidence increased the predicted ability of different inventories (traits, ideology, identity, etc.) to predict judgments and behaviors.

1. Citation (in chronological order)	2. Study number (in article)	3. Participants	4. Individual difference (variable of primary cognition to be validated)	5. Certainty in individual difference (measured or manipulated)	6. Dependent measure	7. Outcome summary
Wichman et al. (2010)	1	37 undergraduates	Self-doubt	Manipulated	Uncertainty in causal judgments	Self-doubt predicted less certainty in causal judgments when trait certainty was induced to be high
Shoots-Reinhard et al. (2015)	1	204 undergraduates	Need for cognition (NFC)	Measured	NFC at time 2 (Stability)	NFC was more stable over time as certainty in NFC increased
Shoots-Reinhard et al. (2015)	2	208 undergraduates	Political Ideology. Need to evaluate (NE)	Measured	Policy attitudes; Number of 'no opinion' responses	Conservative ideology predicted more conservative political attitudes as certainty in that ideology increased. NE predicted fewer 'no opinion' responses as certainty in NE increased.
Shoots-Reinhard et al. (2015)	3	150 undergraduates	Political Ideology	Measured	Policy attitudes	Conservative ideology predicted more conservative related policy attitudes as reported certainty in the ideology increased (replication of study 2)
Santos et al. (2019)	1	160 undergraduates	Trait aggressiveness	Measured	Aggressive behavioral intentions	Trait aggressiveness predicted more intentions to act violently as certainty in the trait increased
Santos et al. (2019)	2	114 undergraduates	Trait aggressiveness	Measured	Aggressive behavioral intentions; Aggressive behavior (administering hot sauce to others)	Trait aggressiveness predicted both more aggressive intentions and aggressive behavior as certainty in the trait increased
Vitriol et al. (2019)	1	411 undergraduates	Political Ideology	Measured	Political engagement	Political ideology predicted more political engagement as certainty in the ideology increased
Vitriol et al. (2019)	2	1054 U.S. citizens	Political Ideology	Measured	Political engagement	Political ideology predicted more political engagement as certainty in the ideology increased
Vitriol et al. (2019)	3	170 Mturkers	Political Ideology	Manipulated	Political engagement	Political ideology predicted more political engagement when induced certainty was high
Vitriol et al. (2019)	4	798 Mturkers	Political Ideology	Manipulated	Political engagement	Political ideology predicted more political engagement when certainty in the ideology was high
Paredes et al. (2020)	1	299 undergraduates	Identify fusion (IF)	Measured	Willingness to fight and die for one's group (WFD); Sacrifice in Trolley dilemma	IF predicted more WFD and sacrifice as certainty in IF increased
Paredes et al. (2020)	2	607 undergraduates	Identify fusion (IF)	Measured	Willingness to fight and die for one's group (WFD)	IF predicted more WFD as certainty in IF increased
Paredes et al. (2020)	3	483 undergraduates	Identify fusion (IF)	Measured	Sacrifice in trolley dilemma	IF predicted more sacrifice as certainty in IF increased

Table 1. Continued.

1. Citation (in chronological order)	2. Study number (in article)	3. Participants	4. Individual difference (variable of primary cognition to be validated)	5. Certainty in individual difference (measured or manipulated)	6. Dependent measure	7. Outcome summary
Paredes et al. (2021)	1	268 undergraduates	Problematic pornography use (PPUS)	Measured	Reported porn consumption	PPUS predicted more porn consumption as certainty in PPUS increased
Paredes et al. (2021)	2	151 undergraduates	Problematic pornography use (PPUS)	Manipulated	Reported porn consumption; Porn-related behavior (coupons)	PPUS predicted more porn consumption and related behavior when induced certainty was high.
Horcajo et al. (2022)	1	166 CrossFit athletes	Self-efficacy (SE)	Measured	Physical performance (number of pull-ups)	SE predicted higher performance as certainty in SE increased
Horcajo et al. (2022)	2	132 CrossFit athletes	Self-efficacy (SE)	Manipulated	Physical performance (vertical jump)	SE predicted higher performance when induced certainty was high
Horcajo et al. (2022)	3	197 undergraduates	Self-efficacy (SE)	Measured	Cognitive performance (scores on an academic test)	SE predicted higher performance as certainty in SE increased
Moreno et al. (2022)	Pilot	144 undergraduates	Self-efficacy (SE)	Measured	Cognitive performance (three tasks: geometric shapes task, syllogism problems, and a brief exam on psychology)	SE predicted higher performance as certainty in SE increased
Paredes et al. (2022)	1	166 undergraduates	Inventory of Beliefs about medicines (BMQ)	Measured	Vaccines advocacy willingness (VAW)	BMQ predicted more VAW as certainty in BMQ increased
Paredes et al. (2022)	2	202 undergraduates	Inventory of Vaccination Attitudes Examination (VAX)	Manipulated	Vaccines advocacy willingness (VAW)	VAX predicted more VAW when induced certainty was high
Díaz et al. (2024)	1	200 Spanish general population	Persecutory Ideation Questionnaire (PIQ)	Measured	Satisfaction with life (SWL Scale)	PIQ predicted less SWL as certainty in PIQ increased
Díaz et al. (2024)	2	60 diagnosed with mental disorder	Persecutory Ideation Questionnaire (PIQ)	Measured	Satisfaction with life (SWL); Therapy length	PIQ predicted less SWL as certainty in PIQ increased; PIQ predicts more time in therapy as certainty in PIQ increased.
Moreno et al. (2024)	Pilot	502 undergraduates	STEMM identity	Measured	STEMM interest	STEMM identity predicted greater STEMM interest as certainty in identity increased
Moreno et al. (2024)	1	602 undergraduates	STEMM identity	Measured	Cognitive performance (mental rotation test)	STEMM identity predicted higher cognitive performance as certainty in identity increased
Moreno et al. (2024)	2	328 undergraduates	STEMM identity	Measured	STEMM-related choice (try out a STEMM career)	STEMM identity predicted STEMM choices more as certainty in identity increased
Moreno et al. (2024)	3	438 undergraduates	STEMM identity	Manipulated	Cognitive performance (math test - GRE)	STEMM identity predicted higher STEMM performance when induced certainty was high.

(Continued)

Table 1. Continued.

1. Citation (in chronological order)	2. Study number (in article)	3. Participants	4. Individual difference (variable of primary cognition to be validated)	5. Certainty in individual difference (measured or manipulated)	6. Dependent measure	7. Outcome summary
Santos, Requero et al. (2025)	1a	302 Mturkers	Holistic thinking (HT)	Measured	Preference for dialectical proverbs	HT predicted more preference for dialectical proverbs as certainty in HT increased
Santos, Requero et al. (2025)	1b	354 CloudResearch	Holistic thinking (HT)	Manipulated	Preference for dialectical proverbs	HT predicted more preference for dialectical proverbs when induced certainty was high
Santos, Requero et al. (2025)	2	335 undergraduates	Holistic thinking (HT)	Measured	Attitude change following counter-attitudinal essay	HT predicted more counter-attitudinal responses as certainty in HT increased
Santos, Requero et al. (2025)	3	299 Mturkers	Holistic thinking (HT)	Manipulated	Objective-Subjective Ambivalence (OA-SA) correspondence	HT predicted lower OA-SA correspondence when induced certainty was high
Santos, Ghodsinia et al. (2025)	1	207 Mturkers	Honesty-Humility (HH)	Measured	Cheating behavior (dilemma of partner's betrayal)	HH predicted lower cheating behavior as certainty in HH increased
Santos, Ghodsinia et al. (2025)	2	248 CloudResearch	Dark Triad (DT)	Measured	Cheating behavior (misreporting outcome for financial gain)	DT predicted more cheating behavior as certainty in DT increased
Santos, Ghodsinia et al. (2025)	3	142 CloudResearch	Honesty-Humility (HH) Dark Triad (DT)	Manipulated	Cheating intentions	HH predicted fewer cheating intentions when induced certainty was high; DT predicts more cheating intentions when induced certainty was high.
Toader et al. (2025)	1	296 undergraduates	Generalized Sense of Power Scale (GSPS)	Measured	Immoral decisions (skipping the line for getting vaccinated)	GSPS predicted more immoral decisions as certainty in GSPS increased

Participants first reported their level of trait aggressiveness on the Buss and Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992) and then reported the perceived validity of their responses to the scale (i.e. how certain they were in their answers). Then, a behavioral measure of aggression was taken, providing participants an opportunity to aggress against a target by choosing the amount of hot sauce to give to that person (e.g. DeMarree & Loersch, 2009; see also Cárdaba et al., 2016). The results of this study showed that the perceived certainty in the participants' BPAQ scores moderated the effects of individual differences in aggressiveness on aggressive behavior. Specifically, trait aggressiveness was found to predict aggressive behavior to a greater extent when participants were more confident in the validity of their reported trait aggressiveness.

In another example, Toader et al. (2025) first asked participants to answer the questionnaire designed by Anderson et al. (2012) to measure individual differences in their sense of power. The behavior of interest in this work was tendency to engage in cheating. After completing the power scale, confidence in the responses to the scale was measured by asking participants to rate how certain they were of their responses. Finally, participants engaged in a series of behavioral paradigms designed to assess actual cheating. Confidence in responses to the power scale moderated the impact of individual differences in power on behaving in a dishonest way across several different tasks. That is, responses to the power scale became more predictive of cheating as confidence in the scale increased.

As noted, certainty not only can be measured but also manipulated. For example, in one study Paredes et al. (2022) showed that participants' responses to a porn-usage scale were associated with increased

porn consumption to a greater extent when felt certainty following scale completion was manipulated to be high rather than low. Participants began by responding to the Problematic Pornography Use Scale (PPUS; Kor et al., 2014). After completing the scale, confidence was manipulated by asking participants to recall past episodes in which they felt either confident or doubtful (Petty et al., 2002). The logic behind this manipulation is that creating a general momentary feeling of certainty by recalling past experiences, though incidental to the responses to the porn scale, would be misattributed to certainty in the current thoughts available in mind (i.e. in this case, the previous responses to the porn inventory), similar to the manner in which incidental emotion can be misattributed to other events (e.g. Briñol et al., 2018; Schwarz & Clore, 1983). At the end of the study, participants were informed that there was a new porn festival in their city. Participants were told that, as a parting gift, they would receive €5 coupons redeemable at the porn festival. Then, the number of coupons taken was counted, which served as the main dependent variable. As predicted, the results indicated that the induced certainty following completion of the PPUS was misattributed to feeling certain in one's responses to the inventory, improving the ability of the scale to predict how many coupons were taken.

As a final illustration of this category, consider individual differences in holistic thinking. Holistic thinking involves seeing things from multiple perspectives and has been associated with important outcomes, such as personal balance and wellbeing (e.g. Nisbett et al., 2001). In a series of studies, Santos, Requero et al. (2025) examined whether consideration of individuals' certainty in holistic thinking could enhance the ability of this individual difference to predict reactions to contradiction-relevant outcomes. As predicted, results revealed that participants with higher holistic thinking scores exhibited higher preference for dialectical proverbs, changed their attitude less following a counter-attitudinal task, and showed weaker correspondence between objective and subjective ambivalence. Most relevant for the present concerns, this work also revealed that participants with higher certainty in their holistic thinking were even more likely to show the predicted outcomes across these three different paradigms. Again, these results are consistent with the idea that certainty can improve the predictive ability of any aspect of the self.

In closing this section, it is important to note that measuring certainty by directly asking participants about how sure they are in their responses to a scale or manipulating certainty, such as by asking them to recall past episodes in which they felt certain, are two different operationalizations of what is ultimately the same thing. When certainty is measured regarding responses to a scale, the certainty scores can originate from differences in the content and/or the extremity of the responses to the inventory (e.g. a sense that the person gave similar answers to each question; Petty et al., 2002), from feelings experienced while answering the scale (e.g. the ease with which scale responses come to mind; Tormala et al., 2007), and from external variables irrelevant to the scale (e.g. the degree of happiness the person is experiencing at the time of the survey completion; Briñol et al., 2007).

Confidence in a given scale can even stem from one's general sense of self-confidence. For example, across several studies and one large survey including more than 100,000 participants, DeMarree et al. (2020) showed that some people tend to be more chronically confident in a wide variety of subjective judgments (e.g. attitudes, future predictions) than are other people. Thus, this research supports the notion that there are dispositional differences in the extent to which people have confidence in their diverse mental contents. Among these individual differences, variables are self-esteem (Santos et al., 2019), self-efficacy (Horcajo et al., 2022; Moreno et al., 2022), and judgmental self-doubt (Mirels et al., 2002). Along with personality differences, there are also socio-demographic factors (e.g. gender) relevant to certainty, at least in some contexts (e.g. Clark et al., 2017; Joyal-Desmarais et al., 2022; Lustria et al., 2013; Noar et al., 2007). We argue that these variables could be useful in predicting the strength of matching effects by affecting certainty in one's scale responses.

In the case of manipulating certainty, the induced certainty can also come from a variety of sources that are relevant or irrelevant to the scale responses themselves. For example, an induction with high relevance to the scale might induce people to believe that they gave a relatively high or low amount of thought to their answers before responding (e.g. Barden & Petty, 2008; Moreno et al., 2022). Less relevant inductions could involve, as noted, having people recalling past episodes in which they were confident or doubtful in other situations or manipulating whether they are made to feel happy or sad during survey completion (Briñol et al., 2007). Yet another approach based on the notion that feeling powerful

enhances confidence (e.g. Briñol et al., 2007; Guinote et al., 2012), is that inducing a feeling of power following completion of a trait scale should enhance its predictive validity just as it enhances the predictive validity of other mental constructs (e.g. Lamprinakos et al., 2024). In short, like measured certainty, manipulated feelings of certainty can come from prior experiences unrelated to the responses to the initial inventory.

The research just reviewed demonstrates that feelings of certainty (whatever the origin) can become attached to participants' perceptions of their own traits (e.g. 'I am confident that I am aggressive'). Thus, one can make similar predictions for certainty regardless of whether it was measured or manipulated, and therefore, regardless of whether certainty arises from origins related to the survey responses or from origins unrelated to responses to the survey. With the notion that measuring or manipulating certainty in responses to an individual differences assessment can enhance the predictive validity of that assessment, we next describe how certainty in one's survey responses can also serve to improve personalized matching effects in persuasion.

Improving matching by tailoring to confidently held traits

Based on the work just described showing that certainty can increase the predictive power of individual differences inventories, one could expect that personalized matching would be particularly effective when a message was matched to a confidently held aspect of the self rather than one held with some doubt. First, it is noteworthy that when attempting to match a message to a person's attitude rather than a personality trait, assessing the certainty in that attitude has been shown to enhance prediction of the matching effect. For example, in one study, Clarkson et al. (2011) examined the effectiveness of matching messages to the affective versus cognitive bases of peoples' attitudes. Although as noted earlier, much research had demonstrated the effectiveness of this sort of matching, Clarkson and colleagues uniquely showed that the matching effect became stronger as certainty in the relevant attitudes increased. Just as measuring *attitude certainty* can enhance prediction of matching effects when matching messages to people's attitudes, so too we argue can measuring certainty in one's traits or characteristics (*trait certainty*) enhance prediction of matching effects when matching messages to those traits.

In one study examining this trait certainty effect in matching, Burton et al. (2025) started with the aim of replicating a previous personalized matching effect and then examining if the effect would be stronger when people held the relevant trait with higher certainty. For the individual difference variable, the trait of introversion versus extraversion was examined. Introverts prefer quiet settings with few people, whereas extraverts prefer more lively settings with many people (Eysenck, 1967). Thus, prior research has shown that different types of messages appeal to each personality type. In the relevant conditions of one study, for example, Wheeler et al. (2005) presented individuals who varied in their extraversion (Eysenck & Eysenck, 1985) with an advertisement containing strong arguments for a consumer product framed either for extraverts (e.g. 'you'll be the life of the party') or for introverts ('you won't have to deal with crowds'). The results showed that participants lower in extraversion (i.e. more introverted) were more influenced by the introvert-framed message but those high in extraversion were more influenced by the extravert-framed message (see also, Hirsh et al., 2012).

To conceptually replicate this extraversion matching effect and additionally examine the impact of trait certainty, Burton and colleagues adapted a paradigm used previously to examine matching effects with respect to self-monitoring. Specifically, Shavitt et al. (1992) exposed participants to 4 ads containing utilitarian arguments (appealing to low self-monitors) and 4 social identity ads (appealing to high self-monitors). Participants were told to select the three ads that were most appealing to them. The results indicated that participants were more likely to select ads matched to their personality (i.e. increases in self-monitoring led to a selection of more social-adjustive ads). In the current research, participants' degree of extraversion (Eysenck & Eysenck, 1985) was assessed along with their certainty in those scores. Then, participants were presented with 4 claims for a new coffee shop designed to appeal to extraverts (e.g. an atmosphere buzzing with energy) and 4 to introverts (e.g. a gentle atmosphere assuring peace and quiet). Like Shavitt et al. (1992), participants were asked to select the three ads that were most appealing to them.

A multiple linear regression assessing the impact of extraversion, certainty and their interaction produced a main effect of extraversion such that as extraversion scores increased, participants selected more extraversion ads as appealing to them. This conceptually replicated the matching effect Shavitt et al. (1992) found for self-monitoring, but this time for extraversion. More importantly, this analysis also produced an interaction between extraversion and certainty showing that the impact of trait extraversion on ad selection occurred to a greater extent as certainty in the trait increased (see Figure 1). Thus, assessing certainty in one's trait enhanced the matching effect as predicted.

To examine this same interaction prediction but for a different individual difference and in a persuasion paradigm rather than an ad selection paradigm, Santos, Briñol, & Petty (2025) also aimed to replicate a prior matching effect, and further demonstrate that this effect would be moderated by measured trait certainty. This study replicated and extended prior research by Ein-Gar et al. (2012) that found that two-sided messages (presenting the advocated side but also some arguments on the opposing side) were generally more influential than one-sided communications for individuals with a holistic thinking style. In contrast, one-sided messages were more impactful for individuals with an analytic style (Choi et al., 2007). One possible reason for this outcome is that holistic individuals (more than analytical ones) might expect there to be two sides to most issues (thinking about the issue holistically), and thus two-sided messages match their expectations.

This left open the question as to whether enhanced confidence in responses to a holism scale would enhance the matching effect. Thus, these investigaors first assessed participants' level of holistic thinking (Spencer-Rodgers et al., 2010). After completing the scale, certainty was measured by asking participant to report how certain they were in the responses to the inventory. Following this, participants received either a one- or two-sided persuasive message advocating in favor of mask wearing during the COVID-19 pandemic. Finally, participants reported their attitudes toward the mask proposal. As predicted, participants with higher levels of holistic thinking were found to show more favorable attitudes toward the proposal when it was presented in a two-sided (vs. one-sided) message. More importantly, the obtained personalized matching effect was only evident for participants with relatively high certainty in their holism scores (Figure 2, top panel), but was absent for those with lower levels of confidence in their scores (Figure 2, bottom panel).

To the best of our knowledge, the extraversion and holism studies just described provide the first evidence of strengthening matching effects by targeting variables of the recipient that are held with high certainty. That is, by measuring the certainty with which participants hold their extraversion and holistic thinking traits, the matching effect between the thinking style and the frame of the message was increased. Because scale certainty could be confounded with scale extremity, it is important to note that
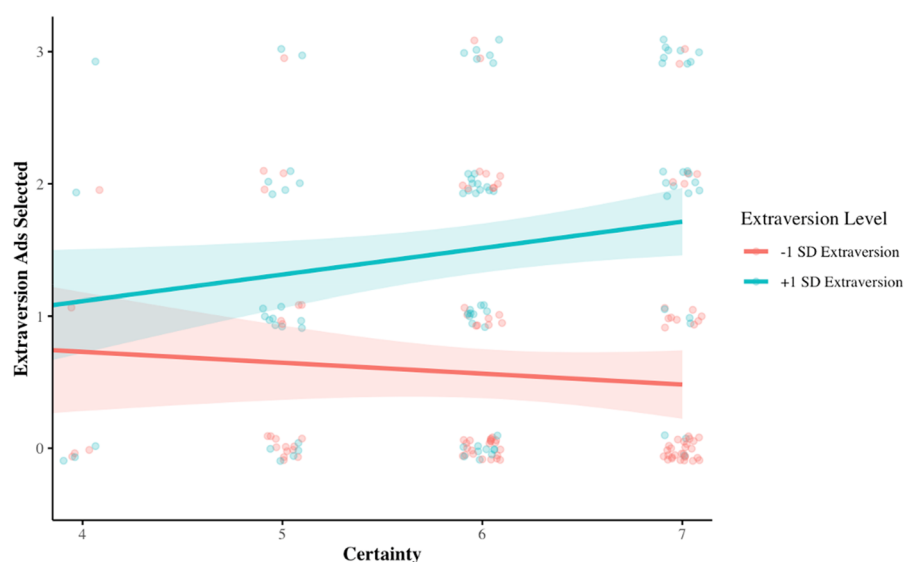

Figure 1. Selection of extroversion ads as a function of trait extroversion and certainty. The x-axis reflects the raw values of the actual scale of the certainty measure, with lower values indicating lower certainty and higher values indicating higher certainty (data from Burton et al., 2025).
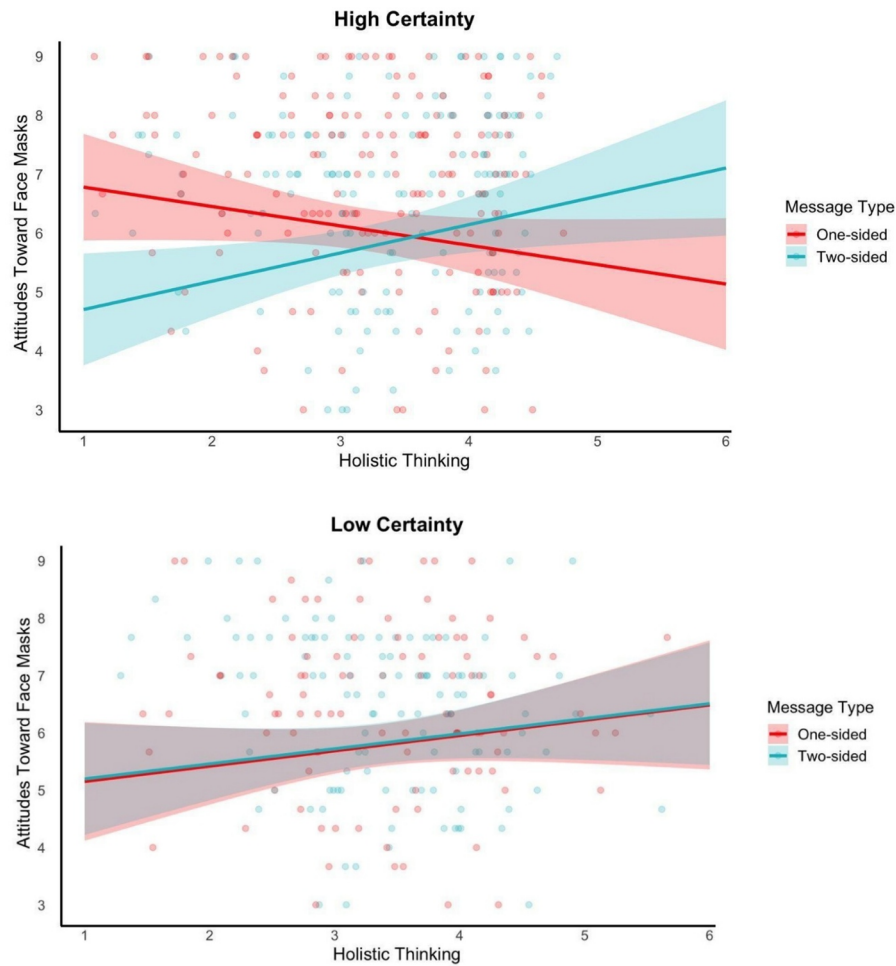
Figure 2. Attitudes toward the proposal as a function of holistic-analytic thinking, certainty, and the type of message received (one vs. two-sided). Data from Santos, Briñol & Petty (2025).

these results were not due to differences in the extremity of the individual difference scores. Indeed, scale extremity and certainty showed a non-significant correlation for the holism study, and a relatively small positive correlation in the extroversion study. Furthermore, when including an extremity index as a covariate in the regression analyses, the results remained significant in both studies.

Summary and future research directions

We presented several illustrative examples showing that just as certainty can increase the predictive ability of individual differences inventories in a wide variety of situations (see Table 1), personalized matching can also be strengthened when a message is matched to a confidently held aspect of the self. Beyond the utility of measuring certainty in various individual differences to enhance the prediction of matching effects, the work we described also suggests that experimentally enhancing the felt certainty following an individual difference measurement (e.g. by having participants recall a past experience of confidence) can likewise enhance the impact of messages matched to that individual difference. Thus, we encourage personality researchers to use certainty measures (and inductions) as potential moderators of individual difference scales because of their ease of application and their impact on the predictive validity of all kinds of inventories. Indeed, including a measure of certainty requires only one extra item and thus has a minimal impact on the length of the questionnaire, and should be easy and efficient to complete. Furthermore, as noted earlier, certainty also can be inferred indirectly from more general individual differences as well as demographic measures (e.g. DeMarree et al., 2020).

In closing, we discuss several avenues for future persuasion matching research. First, in addition to improving person-situation matches by taking trait certainty into account, it is important to emphasize that there are other strength features that could be examined. Thus, researchers could assess subjective ambivalence regarding a trait to see if people feel conflicted about their responses to a scale (Priester & Petty, 1996), or assess the importance of the scale to see if the trait is seen as a relevant or critical aspect of oneself (Turner-Zwinkels & Brandt, 2023, Vaughan-Johnston et al., 2020), or measure trait accessibility to see how quickly people respond to the individual items on the scale with faster responses potentially being associated with greater matching effects (DeMarree et al., 2007).

Other meta-cognitive assessments not typically examined in the attitude strength literature might also affect the impact of trait inventories (and therefore be potentially relevant for strengthening matching), such as how much one likes or enjoys the way they are or their style of thinking (e.g. Gascó et al., 2018; see, Briñol & Petty, 2018, for a review). Traits that people like about themselves would presumably be more impactful than traits they do not wish to have (DeMarree et al., 2014). The same logic for strengthening matching would apply to any trait held with high consistency (low ambivalence; Briñol et al., 2006) or that people prioritize (or perceive to be particularly self-defining, e.g. Schwartz et al., 2012). Future matching studies can benefit from measuring and manipulating these additional meta-cognitive perceptions.

Second, just as taking confidence in (and other meta-perceptions of) individual differences into account can strengthen matching effects when processing externally originated persuasion messages, we argue that the same is likely to be true for self-generated messages. For example, initial work on matching with self-generated messages was reported by Shavitt et al. (1992). In this research, high and low self-monitors were presented with consumer products that could be categorized as having either a mostly utilitarian function (e.g. watches) or mostly a social identity function (e.g. sunglasses). Participants were then asked to generate and design ads that would 'explicitly appeal to themselves'. Low self-monitors constructed ads composed mostly of utilitarian arguments, whereas high-self monitors made ads composed mostly of social identity arguments regardless of the product (see also Shavitt et al., 1997). In another example, Resch and Lord (2011) found that when participants high in need for cognition used epistemic strategies (like reinterpreting thoughts, and other cognitively demanding methods; Maio & Thomas, 2007), it resulted in greater self-persuasion. Together, these studies suggest that people tend to generate arguments that match their own personality or cognitive style, and the generation of matched messages can be effective in producing self-persuasion.

As was the case for traditional personalized matching effects, we propose that these other matching-production effects can also be improved by considering the confidence with which recipients hold the traits that are matched to the messages they generate. In an initial exploration of this possibility, Santos, Burton et al. (2025) asked participants to complete the holistic-analytic thinking scale, after which their certainty in their scores was measured. Then, rather than receiving a one or two-sided message (as described earlier in this review, see Figure 2), participants were asked to generate either a one- or two-dimensional messages to convince another person of their strengths. Specifically, participants were asked to convince others that they were either a good potential friend *or* that they were a good potential coworker (one-dimensional message) or that they were *both* a good friend *and* a good co-worker (two-dimensional message). This manipulation was adapted from previous research based on the presumed trade-off between warmth and competence (Fiske et al., 2002) where people tend to believe that an apparent surplus of one trait implies a deficit of the other. Thus, warmth and competence can be perceived as somewhat incompatible, or hydraulic, dimensions, at least in some cases (Judd et al., 2005). Finally, self-evaluation was assessed as the dependent measure. The results revealed that participants reporting relatively higher levels of holistic thinking showed more favorable attitudes toward themselves when they had to generate a two-dimensional (vs. one-dimensional) message. Importantly, these effects were magnified for those who reported a relatively high degree of certainty in their responses to the individual differences measure (see Figure 3, top panel). For those with relatively low certainty, the pattern was reversed (Figure 3, bottom panel).

In another conceptually similar study of this set, we examined whether certainty in extroversion-introversion scores would produce stronger matching effects in a self-persuasion paradigm. First, participants completed the extroversion-introversion inventory (Eysenck & Eysenck, 1985) and then rated the confidence in

their responses. Next, participants were asked to come up with slogans to advertise earbuds that were designed either to party with others or to enjoy music alone. Consistent with predictions, there was more persuasion when participants generated slogans that matched (vs. mismatched) their personality. Most relevant, confidence further strengthened those personalized matching effects, with participants reporting being more confident of their responses to the extroversion-introversion scale showing more self-persuasion compared to those with relatively lower levels of certainty. Taken together, these studies provide consistent evidence of matching effects when people generate messages, and most relevant for the present concerns, they also provide evidence for how considering certainty in individual differences can enhance matching effects not only for traditional persuasion paradigms but also for self-persuasion.

Third, just as perceptions of one's traits matter (e.g. the extent to which people perceive their traits as valid), we conclude by noting that perceptions of the situation are also likely to be relevant for strengthening person-situation matches. That is, strength features can be linked not only to individual differences variables, but also potentially with how people perceive the messages they receive or produce, and the situation in which that message is delivered (Santos et al., 2022). For example, just as one can measure confidence in extraversion, one could also measure the extent to which a message (received or produced) is perceived as extraverted, and also how confident people are in that perception.
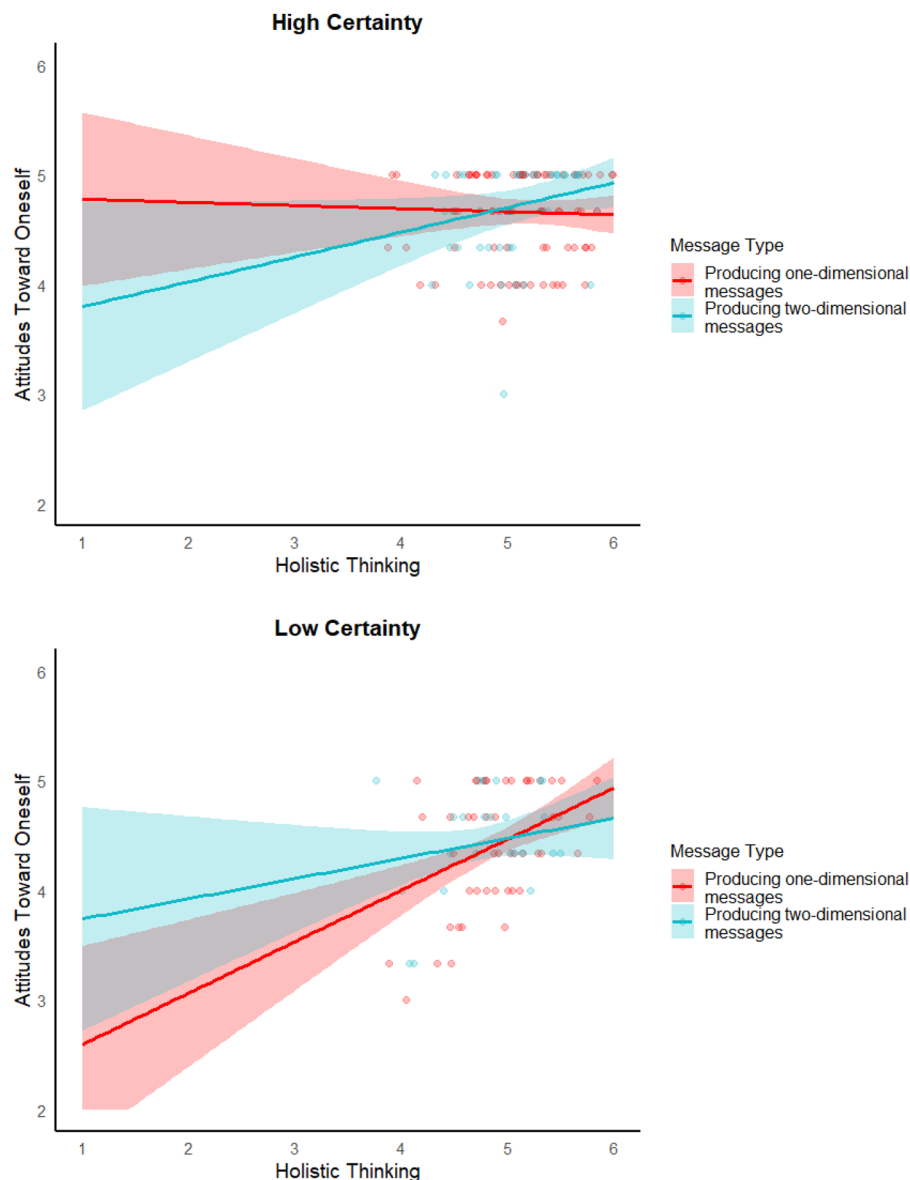

Figure 3. Self-evaluation as a function of holistic-analytic thinking, certainty, and the type of the message generated about the self (one vs. two dimensional; data from Santos, Burton et al., 2025).

Finally, one clear conclusion of our review is that the strength of people's perceptions of their traits matter for making matching effects in persuasion more effective. As noted, whether those perceptions are about confidence, importance, or whether they are about the dimensions of the recipient, or potentially about features of the message, or even about the relationship between them, we argue that these perceptions can make a difference. Indeed, one can image measuring (and manipulating) additional perceptions that might be relevant. For example, research has shown that asking participants what they think about the origin of their responses to the scale (e.g. whether the origin comes from oneself or is originated externally) along with the perceived validity of that origin can be important for strengthening persuasion (e.g. Gascó et al., 2018; Kim et al., 2021). Thus, how people perceive the origin and the consequences of their responses (including thoughts, attitudes, traits, etc.) could be an additional avenue for future work on strengthening matching as well. Finally, asking participants how confident they are that the scale measures what it intends to measure might add as well, and assessing how well calibrated (or biased) recipients perceive any instrument is (and to what extent they try to correct their responses based on those perceptions) could further contribute to this literature.

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