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Matching Two-Sided Messages to Individual Differences in Holistic Thinking: Consequences for Information Processing, Persuasion, and Attitude Strength

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Abstract

This research develops a new type of personalized matching in persuasion, identifies the process underlying the effect, and demonstrates its consequences. Across three studies, individual differences in holistic thinking were matched with message sidedness (one-sided vs. two-sided). Study 1 showed that personalized matching influenced attitudes by affecting message elaboration, indexed by the attitudinal impact of strong versus weak arguments. Attitudes in matched (vs. mismatched) conditions were more affected by argument quality, indicating that elaboration was the mechanism underlying the matching effect. These differences were consequential because attitudes formed under higher elaboration more strongly guided behavioral intentions. Study 2 demonstrated that simply framing a one-sided message as two-sided, while holding content constant, was sufficient to produce the matching effect. Study 3 (pre-registered) confirmed that individuals higher in holistic thinking were more persuaded by two- than one-sided messages. Together, this research contributes to understanding how to facilitate persuasion through personalized messaging.

Keywords

matching, message sidedness, holistic-analytic thinking, elaboration, attitude strength

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Introduction

In an era marked by increasing polarization, ideological entrenchment, and resistance to alternative viewpoints (Finkel et al., 2020; Gallup, 2025; Pew Research Center, 2023), the ability to tailor persuasive messages in a way that fosters openness and thoughtful engagement is more critical than ever (Ottati & Stern, 2023). Prior research has demonstrated that two-sided messages—those that acknowledge opposing viewpoints rather than just one side—can promote openness to influence, especially for those with the strongest attitudes (Xu & Petty, 2022, 2024). Yet, only a few other moderators of the effectiveness of one versus two-sided messages have been uncovered (see O'Keefe, 1999, for a review). In the present work, we propose a novel moderator—that the effectiveness of one- versus two-sided messages depends in part on recipients' thinking style—specifically, whether they are holistic or analytic in their cognitive orientation. That is, we examine whether matching the *sidedness* of a message to a person's thinking style can enhance persuasion.

The contrast between holistic and analytic thinking styles reflects differing approaches to information processing: holistic thinkers tend to see the big picture, integrating context and relationships, whereas analytic thinkers focus on elements and logical sequences (Nisbett et al., 2001). The concept of holistic-analytic thinking has often been studied using a cross-cultural approach because individuals from East Asian cultures tend to exhibit a holistic thinking style, whereas those from Western cultures tend to be more analytic (see Nisbett & Masuda, 2003; Spencer-Rodgers & Peng, 2017, for reviews). Just as cultures can differ in their thinking styles, individuals within the same culture can also exhibit the same variations (Knight & Nisbett, 2007). Holistic thinkers tend to be more open to accepting contradictions, and they seek compromise between opposing viewpoints. On the other hand, analytic thinkers aim to identify the most plausible position and reject

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contradictions (Nisbett et al., 2001). The present work follows this individual-differences approach by considering how people who differ in their holistic-analytic styles respond to different persuasive treatments.

The current research follows a long tradition examining how attitude change can be enhanced by matching (versus mismatching) a particular aspect of the recipient of persuasion to a particular aspect of the message. For example, in an early study, individuals who were high in self-monitoring (Snyder, 1979) were more influenced by messages focused on the image of a product rather than its quality, whereas those low in this trait showed the opposite effect (Snyder & DeBono, 1985; see Teeny et al., 2021; Petty et al., 2025, for reviews). Following this approach, the current research develops a relatively new form of personalized persuasion by exploring whether matching the sidedness of a message (one-sided vs. two-sided) to the thinking style of a recipient (analytic vs. holistic) increases persuasion. The underlying process by which this matching effect operates is also examined along with the downstream consequences for attitude strength. Moreover, this research is designed to be the first to test the moderating role of subjective perceptions of the message in this matching paradigm by examining whether the content of the message needs to be objectively one- or two-sided or merely perceived as such.

Holistic Thinking and Responses to Mixed Information

Holistic individuals tend to seek middle ground when they are presented with information coming from two sides of the same issue as compared to their analytic counterparts. For example, Peng and Nisbett (1999) provided participants with descriptions of contradictory information (incompatible statements) and showed that holistic thinkers (e.g., Chinese participants) judged the plausibility of the two opposing statements as more similar to each other, whereas analytic thinkers (e.g., American participants) polarized their judgments—rating one statement as more plausible than the other. Similar patterns have been replicated when assessing holism as an individual-difference variable using the Analysis-Holism Scale (AHS; Choi et al., 2007; Santos et al., 2021).

In another illustration, Luttrell et al. (2022; Study 1) found that holistic individuals (using the Dialectical Self-Scale [DSS]; Spencer-Rodgers et al., 2004, 2018) held attitudes that were more ambivalent (Priester & Petty, 1996). In yet another study, using a variety of instruments to assess holism (including the DSS and the AHS), Santos, Requero, Moreno, et al. (2025) found that participants higher in holistic thinking exhibited a greater preference for dialectical proverbs, changed their attitudes less following a counter-attitudinal task, and showed weaker correspondence between objective and subjective ambivalence. Similarly, DeMotta et al. (2016) found that consumers with a more holistic thinking style were more likely to tolerate contradictory brand information and maintain positive evaluations despite inconsistencies. Consistent with these precedents, the current research will also rely on the AHS and DSS to assess individual differences in the tendency to engage in holistic thinking.

The DSS and AHS are highly correlated (Martín-Fernández et al., 2022; Spencer-Rodgers et al., 2018) and are used in the present research as two potentially related, but still distinct aspects of how different individuals understand, tolerate, and respond to contradiction, inconsistency, and the coexistence of competing perspectives. While holistic thinking is generally conceptualized as a broader cognitive style characterized by attention to context, relationships, and change (Nisbett et al., 2001), dialectical thinking focuses more specifically on the acceptance of contradiction, change, and the coexistence of opposing perspectives (Spencer-Rodgers & Peng, 2017). We make the same predictions for these two scales, not because the scales are identical, but because the scales both assess a tendency for people to recognize and tolerate competing viewpoints. This shared conceptualization renders individuals higher on either construct more receptive to two-sided messages.

Finally, we note that in another experiment that is particularly relevant to the current research, Ein-Gar et al. (2012) explored how individual differences in holistic-analytic thinking influenced responses toward mixed information about a product. In this study, participants received information about a product with either only positive attributes or with positive and negative attributes. Holistic thinkers reported a greater willingness to try the product when its description included negative information rather than when it was exclusively positive. Although their explanation for this effect did not rely on a personalized matching account and the mixed message only highlighted a single minor flaw or downside (rather than offering more complete information), this study nonetheless provides indirect evidence suggesting that greater holistic thinking is associated with more persuasion when the message is two- (vs. one-) sided. Ein-Gar et al. (2012) explained their outcome by arguing that under certain conditions, those high in holistic thinking actually prefer a "blemished" product. This is different from our matching explanation that holistic thinkers, more so than analytic thinkers, may anticipate that most issues have two sides, making two-sided messages more consistent with their expectations.

Moreover, beyond introducing a new account for the effect, the present work introduces several qualitative advances that go beyond Ein-Gar et al. (2012). Whereas their single study showed that the effect was present, our research aims to identify and provide empirical evidence for the proposed underlying process responsible for the effect, and it also examines its consequences for both attitude change and attitude strength. These two new contributions alone are important because much of the prior matching literature has focused on documenting matching effects but has devoted comparatively less attention to identifying the mechanisms

responsible for those effects and their downstream consequences (see Petty et al., 2025; Teeny et al., 2021, for recent reviews). In addition to these broader contributions, the present research also extends and generalizes the findings of Ein-Gar et al. (2012) in several incremental but meaningful ways. We broaden the conceptualization from holistic-analytic thinking to dialectical thinking (using the DSS), examine attitude change and behavioral intentions rather than focusing solely on product evaluations, employ more comprehensive and validated two-sided messages (Xu & Petty, 2022), test the effects across multiple socially relevant attitude objects rather than a single consumer product, and preregister the focal hypothesis.

Matching Effects in Persuasion: The Role of Elaboration

There is considerable research on the relative effectiveness of two-sided versus one-sided communications (see Crowley & Hoyer, 1994; O'Keefe, 1999 for reviews), and as noted earlier, only a few moderators have been uncovered. For example, prior research has found that two-sided messages tend to be more effective when the audience is higher in intelligence (Hovland et al., 1949), or in their need for cognition (Cacioppo & Petty, 1982; see Kao, 2011), or holds strong attitudes (Xu & Petty, 2024). However, the impact of message sidedness has not been examined directly with respect to holism. As noted, the current research is designed to provide a direct test of the suggestive evidence obtained in prior research (Ein-Gar et al., 2012) as well as to explain *why* this matching effect operates.

The literature on personalized matching, which keeps growing (Petty et al., 2025), has dedicated comparatively more attention to identifying new matching effects than to specifying the underlying processes by which those matching effects operate. Yet, understanding these mechanisms and when they operate is important because, depending on why a match works, the resulting attitude change could differ in how consequential it is (Briñol & Petty, 2025). To predict when and how the personalized matching effect of interest produces its effects and downstream consequences, we rely on the psychological mechanism of elaboration (Petty & Cacioppo, 1986).

In one demonstration of the mediation of personalized matching by elaboration, Petty and Wegener (1998) gave participants one of two types of shampoo advertisements: an image ad (discussing how the shampoo makes one's hair look) or a quality ad (discussing how well the shampoo cleans). For high self-monitors, the image ad is a match because these individuals are concerned about their image and fitting in with others. For low self-monitors, the quality ad is a match because these individuals are concerned with being themselves and acting on merit (with the reverse pairings constituting mismatches). The arguments used to support the image and quality ads were either strong or weak (see also DeBono & Harnish, 1988). The researchers found that matched messages were not uniformly more persuasive. Instead, the results suggested that people elaborated more on matched messages, presumably because the matched message seemed more relevant and increased relevance motivates thinking (Petty & Cacioppo, 1990). Because matching increased elaboration, it led to more persuasion for strong arguments but reduced persuasion for weak arguments (see Fujita et al., 2008; Wan & Rucker, 2013; Wheeler et al., 2005, for additional examples).

Personalized matching can increase elaboration by enhancing motivation to think, but also by affecting ability. For example, some research highlights how matched messages can be *easier* to process (e.g., the arguments might be more familiar; see See et al., 2013), which facilitates the ability to understand and elaborate on the message. Matching can influence not only the persuasion outcome (increasing persuasion for strong arguments but decreasing persuasion for weak arguments) but also how consequential those changes are. The elaboration likelihood model (ELM; Petty & Cacioppo, 1986) holds that the extent of thinking underlying a change in attitude determines how strong (i.e., durable and impactful) the new attitude will be (Krosnick & Petty, 1995), with attitudes resulting from high thought being stronger (e.g., more guiding of behavior) than attitudes based on lower thought (Petty et al., 1995; see Petty et al., 2023, for some exceptions). In this research, we predict that matching holism to two-sided messages would result in more elaboration than mismatching and that attitudes based on more elaboration would be more consequential in terms of guiding behavioral intentions (see also Cancela et al., 2021). Note that we propose the match of thinking style with message sidedness to increase elaboration, and not holistic thinking alone, per se, which, if anything, would be linked to heuristic processing as suggested by Ein-Gar et al. (2012).

Actual Versus Perceived Message Sidedness

Beyond explaining how matching message sidedness to holism operates (i.e., by enhancing elaboration), and testing its consequences for guiding behavior, another innovation of the present research is examining whether presentation of an actual two-sided message is required for the effect to occur or if the mere perception that a message has considered both sides is sufficient (Study 2). Our prediction about the mere perception of two-sidedness is based on a prior study by Rucker et al. (2008), which explored how simply framing a message as one-sided or two-sided affected message recipients' attitude certainty, though in our case, we expect the effect on attitude favorability. In the Rucker et al. research, participants read a description of a bicycle, presented as a typical one-sided message (all positive product attributes grouped together) or as a two-sided message (attributes were divided into "pros" and "cons"). Importantly, the two-sided format did not actually list any negatives under cons, but it

suggested that potential negatives had been considered. Participants then rated their attitudes toward the bicycle and the certainty of their attitudes. Results indicated that the two-sided framing increased attitude certainty over the one-sided format. This work suggests that the critical driver of the effect may be recipients' subjective inference that both sides have been considered, rather than objective message balance itself. Therefore, examining the extent to which the matching effect can emerge for two-sided "framed" messages (that keep objective sidedness constant) is another innovation of the present work.

Overview of the Studies

The goals of the present research are to: (a) provide direct evidence for a relatively new personalized matching effect in persuasion, (b) explain the process underlying that effect, and (c) show an important downstream consequence of this type of matching. As noted, for the personal characteristic to match, we focused on individual differences in holistic thinking. After examining this matching effect in the first study, and uncovering its underlying process and testing behavioral consequences, the second study was designed to examine a potential limit of the effect—testing whether the content of the message needs to be objectively two-sided or if merely framing a one-sided message as two-sided would suffice to produce the same outcome. Then, having examined the effect across two different topics and two different instantiations of this type of matching, the final study sought to provide stronger evidence of the matching in a pre-registered experiment. We selected two polarized topics across our studies—gun control and Nazi freedom of speech—for two reasons: (a) to examine whether matching message structure to thinking style is effective for strongly held attitudes and (b) because prior research indicates that two-sided messages are most persuasive when recipients hold preexisting attitudes toward the issue (Crowley & Hoyer, 1994).

Study 1

Study 1 was designed to examine the effects of personalized matching in the domain of holistic thinking and message sidedness, as well as to identify the psychological mechanism underlying the effect by using a moderation approach, manipulating argument quality (Spencer et al., 2005). To manipulate argument quality, some participants received a message containing very cogent evidence in favor of the proposal (strong arguments), whereas other participants received a message with less compelling statements in favor of the proposal (weak arguments). The extent to which participants processed the message was assessed by examining the extent to which the quality of the arguments affected attitudes (Petty & Cacioppo, 1990). Finally, participants reported their attitudes toward the proposal.

Our core prediction based on the ELM was for a three-way interaction between holistic thinking, argument quality, and message sidedness on attitudes. We expected that participants in the matched conditions (i.e., those with a higher holistic thinking style assigned to the two-sided message and participants with a lower holistic thinking style assigned to the one-sided message) would exert greater scrutiny of the information contained in the message than those in the mismatched conditions (participants with a higher holistic thinking style assigned to the one-sided message and participants with a lower holistic thinking style assigned to the two-sided message). This greater scrutiny would result in a larger argument-quality effect on attitudes in the matched than in the mismatched conditions.

Furthermore, this study examined how consequential these matching effects are as a function of that process. Thus, in addition to measuring attitudes toward gun control, we also asked participants to report their behavioral intentions relevant to this topic. Past studies on persuasion have provided support for the ELM's elaboration-strength postulate (Petty & Cacioppo, 1986) that claims that attitudes formed under high elaboration conditions are more predictive of behavior than attitudes formed from less thoughtful processes (Cacioppo et al., 1986; Kallgren & Wood, 1986; Leippe & Elkin, 1987; Verplanken, 1991). Consistent with the elaboration-strength postulate, we also hypothesized a two-way interaction between attitudes and matched (vs. mismatched) conditions in predicting behavioral intentions.

Method

Participants and Design. Three hundred and eighty-seven participants (47.9% females and 52.1% males, $M_{age} = 39.31$, $SD = 12.21$) were collected through *CloudResearch* in exchange for monetary compensation ($0.50). By default, we anticipated a generic small effect (Cohen's $f = 0.015$). Results indicated that the desired sample size for a two-tailed test for a three-way design ($\alpha = .05$) with 0.80 power was $N = 351$ participants. Our final sample slightly surpassed the intended sample size ($N = 387$) to allow for attrition. There were no exclusions. Participants were all residents of the United States. Holistic thinking (continuous variable), message sidedness (dichotomous variable), and argument quality (dichotomous variable) were included as predictor variables, whereas attitudes toward the topic and behavioral intentions regarding gun control, the topic for this study, were measured as the criterion variables. Based on a sensitivity analysis (conducted with G*Power), this sample size allowed us to detect effects equal to or higher than $f = 0.141$. All data and code can be found at: https://osf.io/ku6nq/overview?view_only=ee819e7d098e4e11a29a199808fa9da8

Procedure. Permission to conduct the study was provided by the university's institutional ethics committee. As a cover story, the research was introduced as having two parts. The first part was said to involve the validation of personality measures, and the second part to involve message comprehension.

Participants first completed a brief version of the DSS. Next, participants were randomly assigned to either a one- or two-sided message condition that was composed of either strong or weak arguments for both the advocated and the counter-side. After these inductions, participants responded to the measures of attitudes and behavioral intentions. Finally, participants answered several demographic questions and were thanked and debriefed.

Independent/Predictor Variables

Holistic Thinking. Participants' holistic thinking was measured using the DSS-14. The short version of the Dialectical Self-Scale (Spencer-Rodgers et al., 2015) is a direct individual-difference 14-item measure of dialectical thinking in the domain of the self. As noted earlier, dialecticism can be seen as an alternative instantiation of holistic thinking (Nisbett et al., 2001) and produces similar effects. The DSS-14 assesses the tendency to view oneself as contradictory (internally inconsistent) and malleable across time and contexts. The reliability in this sample was adequate ($\alpha = .87$). Higher scores indicated greater holistic thinking ($M = 3.27$, $SD = 0.90$).

Message Sidedness. Participants were randomly assigned to either read a one-sided or two-sided message. In the one-sided message condition, participants received three paragraphs advocating in favor of stricter gun laws. In the two-sided message condition, participants received the same three paragraphs advocating in favor of stricter gun laws as in the one-sided condition but, in addition, received one paragraph acknowledging the position of the other side. Examples of arguments are provided in the description of the argument-quality manipulation below. The messages were adapted from previous research (Xu & Petty, 2022).

Argument Quality. The quality of the arguments was manipulated orthogonal to the message sidedness induction (see the Supplemental Methodology File for the full text of the four messages). For the strong one-sided message condition, the three paragraphs advocating in favor of stricter gun laws were based on compelling logic and merits. For example, one strong argument was, "The United States has far more individual gun ownership than other developed countries, and far more gun violence. In 2013, according to the Centers for Disease Control and Prevention, the U.S. had more than 33,000 firearms deaths: 70 percent of all homicides, more than half of all suicides, and hundreds of accidental and unsolved deaths." For the strong two-sided message condition, in addition to these three paragraphs, a strong argument on the other side was also presented.[1] The counter-argument stated, "Nevertheless, I would like to acknowledge the fact that there are some reasonable points on the other side of this issue. For example, some advocates of gun rights emphasize constitutional protections under the Second Amendment, arguing that its language has been interpreted as guaranteeing an individual right to firearm ownership." For the weak one-sided message condition, the three paragraphs advocating in favor of stricter gun laws were not as compelling, with fewer merits, making it easy to counter-argue the message. For example, one weak argument was, "The United States has far more individuals owning guns than owning cows. In 2013, according to the Livestock and Agriculture Center, the U.S. had more than 33,000 people owning cows, while 34,000 were owning guns. By contrast, countries where firearms are illegal have other ratios." For the weak two-sided message condition, in addition to these three paragraphs, one weak argument on the other side was also included. These messages were pre-tested using two complementary procedures (see Supplemental Materials).

It is important to note that all messages took a position in favor of gun control and that both strong and weak arguments in the one-sided messages argued in favor of the gun control proposal, but the strong message provided more compelling reasons than did the weak one. Similarly, in the two-sided messages, the second side always had arguments against the gun control proposal, but the strong message provided more compelling counter-reasons than the weak message. By keeping the position taken in the message and the direction of the arguments constant and just varying the merits of those arguments, one can infer the amount of scrutiny that participants dedicated to the proposal. The notion is that if individuals are processing the arguments carefully, the quality of the arguments presented, especially in favor of the author's overall pro-gun control position, should have a larger impact on attitudes than if message processing is minimal.

Criterion Variables

Attitudes. Participants answered three 9-point semantic differential scale items regarding their attitudes toward gun control: *dislike-like*, *bad-good*, and *unfavorable-favorable*. Higher values represented more favorable attitudes toward the topic in the message ($\alpha = .97$, $M = 6.28$, $SD = 2.56$).

Behavioral Intentions. Participants were asked whether they would be willing to use a gun if available to defend their lives on a 7-point scale anchored at 1 (*not likely*) and 7 (*extremely likely*). This item was reverse-scored to show avoidance of gun usage ($M = 4.62$, $SD = 2.09$), thus making it in line with measured attitudes. Similar items have been used in prior research to assess intention to use guns (Shapiro et al., 1997). Behavioral intentions are one of the key predictors of actual behavior (Fishbein & Ajzen, 2010).

Results

Attitudes. Attitudes toward gun laws were submitted to a multiple regression with holistic thinking (centered), message sidedness (dummy coded), argument quality (dummy coded), and the interaction terms (the three two-way, and the three-way) entered as predictors. Main and two-way interaction effects analysis can be found in the SOM.

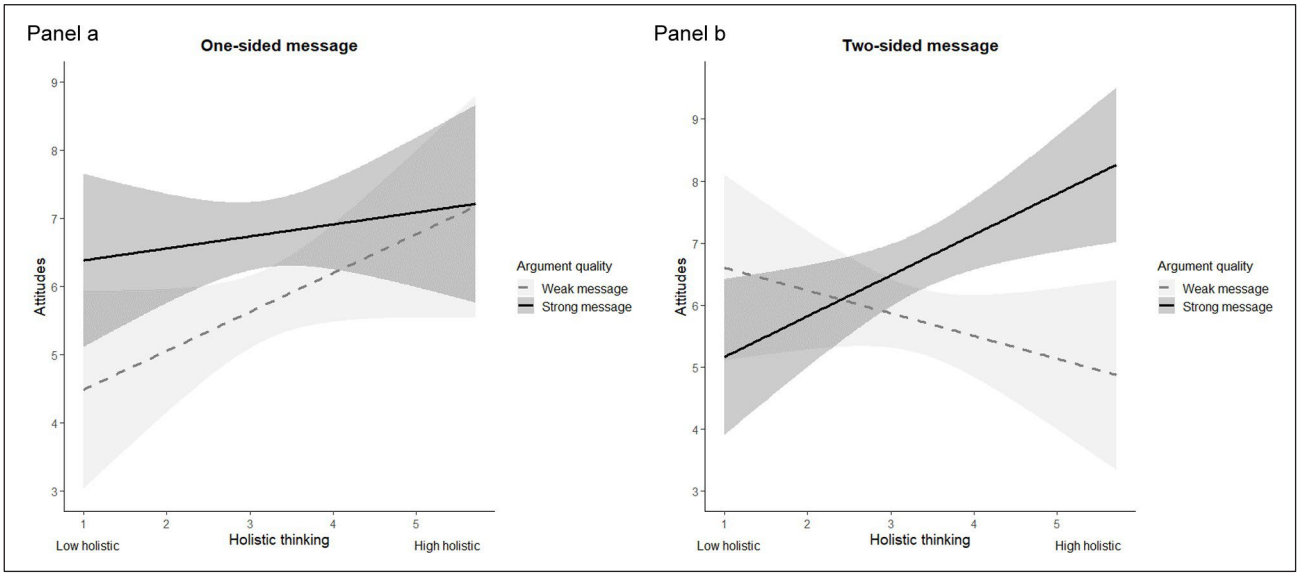

Figure 1. Attitudes as a function of holistic thinking, message sidedness, and argument quality in Study 1: Panel a: One-sided message and Panel b: Two-sided message.

Most importantly, the predicted three-way interaction between holistic thinking, message sidedness, and argument quality on attitudes was significant, $B = 0.355$, $t(379) = 2.471$, $p = .014$, 95% CI [0.073, 0.637], $f = 0.126$. As illustrated in Figure 1 (bottom panel), for the two-sided message condition, there was a significant Holistic Thinking × Argument-Quality interaction, $B = 0.512$, $t(379) = 2.587$, $p = .010$, 95% CI [0.123, 0.902]. This two-way interaction indicated that among those participants with higher holistic thinking scores (+1*SD*), attitudes were more reflective of the quality of the arguments, $B = 0.904$, $t(379) = 3.731$, $p < .001$, 95% CI [0.428, 1.381], compared to participants with lower holistic thinking scores (−1*SD*), $B = -0.020$, $t(379) = -0.076$, $p = .939$, 95% CI: [−0.537, 0.497]. In contrast, for those participants assigned to the one-sided message condition, the Holistic Thinking × Argument-Quality interaction was not evident, $B = -0.197$, $t(379) = -0.948$, $p = .344$, 95% CI [−0.606, 0.212]. Nonetheless, as illustrated in Figure 1 (top panel), follow-up simple slopes analysis revealed a pattern opposite to that in the two-sided message condition. That is, among those participants with lower holistic thinking scores (−1*SD*), attitudes were more reflective of the quality of the arguments, $B = 0.679$, $t(379) = 2.725$, $p = .007$, 95% CI [0.189, 1.168], than for participants with higher holistic thinking scores (+1*SD*), $B = 0.323$, $t(379) = 1.186$, $p = .236$, 95% CI [−0.213, 0.859]. In other words, argument-quality sensitivity was greater among holistic individuals assigned to the two-sided (matched) message condition. In contrast, in the one-sided (matched) message condition, individuals lower in holistic thinking showed greater argument-quality discrimination.

Finally, we combined the matched conditions (low holistic thinking with one-sided message, and high holistic thinking with two-sided message) and compared them to the mismatched conditions (low holistic thinking with two-sided message, and high holistic thinking with one-sided message). We also added a factor to account for the type of matching created (i.e., match to one-sided or match to two-sided message) to this analysis. Then, attitudes were submitted to a 2 (matching conditions: match vs. mismatch) × 2 (argument quality: strong vs. weak) × 2 (type of matching: match to one-sided vs. match to two-sided message) ANOVA. This ANOVA revealed a main effect of argument quality, $F(1, 379) = 13.418$, $p < .001$, $f = 0.188$, indicating that attitudes were more favorable in the strong ($M = 6.74$, $SD = 2.50$) than in the weak message condition ($M = 5.74$, $SD = 2.53$). Moreover, the predicted two-way interaction between the matching conditions and argument quality emerged, $F(1, 379) = 4.709$, $p = .031$, $f = 0.110$. This two-way was not further qualified by type of matching, $F(1, 379) = 0.001$, $p = .972$, $f < .001$. As illustrated in Figure 2, for the matching condition, participants reported more favorable attitudes toward gun control in the strong message condition ($M = 7.01$, $SD = 2.31$) than in the weak message condition ($M = 5.50$, $SD = 2.65$), $F(1, 379) = 18.731$, $p < .001$, $f = 0.222$. For the mismatching condition, there was no difference between participants assigned to read the strong ($M = 6.43$, $SD = 2.69$) and those who read the weak version of the message ($M = 6.05$, $SD = 2.35$), $F(1, 379) = 1.021$, $p = .313$, $f = 0.055$. In accord with our hypothesis, this suggested more elaboration in the matched than mismatched conditions.

Attitudes-Behavioral Intentions Correspondence. The final prediction for this study was that if matching thinking style to message sidedness increases elaboration of the message, then it would be expected to enhance the extent to which

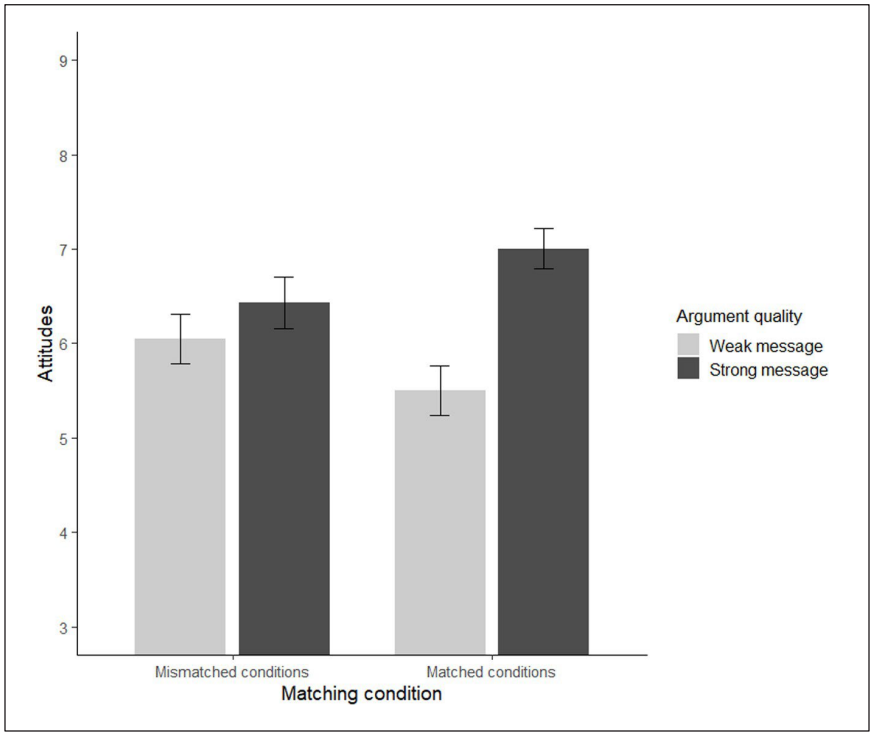

Figure 2. Attitudes as a function of matching and argument quality in Study 1.

attitudes following the message predicted behavioral intentions. To test the idea that attitudes were more predictive of intentions for the matched than mismatched conditions, behavioral intentions were submitted to a regression analysis with attitudes (centered) and the matched vs. mismatched conditions (contrast coded) and type of match (to one- or two-sided message) entered as predictors, and behavioral intentions entered as the criterion variable. This regression revealed that attitudes predicted behavioral intentions overall, $B = 0.240$, $t(384) = 5.994$, $p < .001$, 95% CI [0.161, 0.318]. More importantly, the Attitudes × Matching interaction was also significant, $B = 0.082$, $t(383) = 2.049$, $p = .041$, 95% CI [0.003, 0.161]. As illustrated in Figure 3, this interaction revealed that attitudes were a better predictor of behavioral intentions in the matched, $B = 0.313$, $t(383) = 5.844$, $p < .001$, 95% CI [0.208, 0.418], than in the mismatched conditions, $B = 0.149$, $t(383) = 2.503$, $p = .013$, 95% CI [0.032, 0.266]. The type of match did not further moderate the results, $B = -0.008$, $t(379) = -0.197$, $p = .844$, 95% CI: [−0.087, 0.071].

Discussion

Matching thinking style (degree of holistic thinking) and type of message (one-sided vs. two-sided) interacted with argument quality to affect message processing, which impacted persuasion. In doing so, this study provided the first evidence of the psychological process responsible for a particular matching effect. Specifically, the findings revealed that participants in the matched (vs. mismatched) conditions were more likely to differentiate between strong and weak arguments, suggesting that the matched (vs. mismatched) condition prompted more careful message processing.

Furthermore, this study also examined the ability of attitudes to predict behavioral intentions under the different matching conditions. Results showed that attitudes toward gun control predicted intentions to use guns more in conditions of matching (high elaboration) than in conditions of mismatching (low elaboration). This finding is consistent with the ELM interpretation in that attitudes based on careful thought should predict behavior better than those that are not based as much on thinking (Petty & Cacioppo, 1986). Taken together with the results obtained for argument quality, these attitude-behavioral intentions correspondence results provide clear support for an elaboration explanation of the matching effects observed on attitudes.

Study 2

Study 1 showed that matching holism to message sidedness impacted persuasion by increasing message elaboration. This meant that this type of matching increased *persuasion* only when the message arguments were strong. Thus, for design efficiency, we only use strong arguments in the remainder of the studies to further explore this matching effect. The goals of Study 2 were to (a) provide a conceptual replication of Study 1 but with a new topic (Nazi's freedom of speech), and more importantly (b) to explore whether the effect would

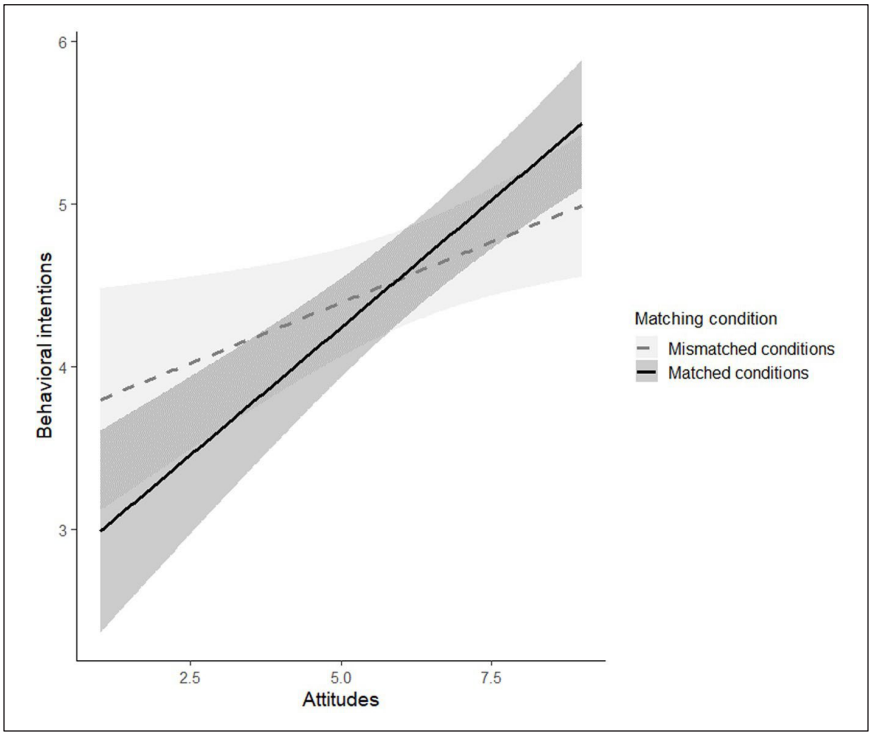

Figure 3. Behavioral intentions as a function of attitudes and matching in Study 1.

hold for mere perception of two-sidedness. Thus, in this study we kept constant the objective content of both messages (all containing strong arguments), but we varied the frame of the message as either one-sided or two-sided. Another change in this study is the attempt at generalization of the results to a different measure relevant to holism: the brief version of the AHS (Choi et al., 2007). After completing the scale, participants received a one-sided message advocating in favor of Nazi's freedom of speech framed either as a one- or two-sided message, as explained shortly. Finally, participants reported their attitudes toward this proposal.

We expected that participants with higher levels of holistic thinking would be more persuaded when receiving a one-sided message that is simply framed as two-sided (vs. framed as one-sided), whereas the opposite would occur for those lower in holistic thinking. Thus, this study hypothesized a two-way interaction between individual differences in holistic thinking and manipulated message frame predicting attitudes. We expected this to occur because people higher in holism have a desire to be open-minded, and a message framed as two-sided (even if it is not) would be appealing because it matched this desire, leading to more elaboration of the strong arguments.

Method

Participants and Design. Assuming a medium interaction effect on attitudes of $f = 0.124$ (obtained in Study 1 for the two-way interaction after reverse-scoring weak-based attitudes), the desired sample size for a two-tailed test ($\alpha = .05$) with .80 power was $N = 509$ (as indicated by an a priori power analysis using G*Power). Thus, 500 participants were collected through *CloudResearch* in exchange for monetary compensation ($0.50). Nineteen participants failed the attention check, leaving a final sample of 481 Connect CloudResearch participants (44.9% females and 55.1% males, $M_{age} = 38.89$, $SD = 12.02$). Participants were all residents of the U.S. Holistic thinking (continuous variable) and message frame (dichotomous variable) were included as predictor variables, whereas a general evaluation regarding Nazi's freedom of speech was measured as the criterion variable.

Procedure. Permission to conduct the study was provided by the university institutional ethics committee. The research was introduced as a study designed to validate different experimental materials. Participants first completed a brief version of the AHS. Then, participants received either a message that was framed as one-sided or two-sided in favor of Nazi's freedom of speech. Attitudes toward the proposal were assessed and served as dependent measures. Finally, participants answered several demographic questions and were thanked and debriefed.

Independent/Predictor Variables

Holistic Thinking. Participants' holistic thinking was measured using a validated brief version of the Analysis-Holism Scale comprised of 12 items (AHS-12; Choi et al., 2007; Martín-Fernández et al., 2022). This scale has been found

to correlate with other holistic thinking measures (Martín-Fernández et al., 2022; Spencer-Rodgers et al., 2018). In this inventory, participants indicated how much they agreed with items such as "It is more desirable to take the middle ground than go to extremes," and "It is more important to find a point of compromise than to debate who is right/wrong, when one's opinions conflict with others' opinions" on a 7-point Likert-type scale anchored at 1 (*strongly disagree*) to 7 (*strongly agree*). The 12 items were averaged to form an index of Holistic Thinking Style ($\alpha = .70$). Although the scale was measured before the experimental inductions, we still ensured that random assignment was successful by showing that holistic thinking scores did not differ as a function of the message frame ($p = .470$). Higher scores indicated a more holistic thinking style, whereas lower scores indicated a more analytic thinking style ($M = 4.92$, $SD = 0.69$).

Message Frame. After completing the AHS, participants were randomly assigned to a one-sided message that was framed either as one- or two-sided. We used a new topic, Nazi's freedom of speech. The one-sided frame message consisted of a presentation in which the information was presented in one column under a single header titled "arguments in favor of the proposal" (with "in favor" highlighted in green). Three arguments were included, and one example was that "It is equally mistaken to claim that it is permissible to suppress hate speech and its advocates because protecting them makes them mainstream. It may well be that our political leaders are saying things that make the white nationalists and their message seem more mainstream than were the Nazis in Skokie" (adapted from Xu & Petty, 2022). The two-sided frame message consisted of a presentation containing two columns. One column was labeled "arguments in favor of the proposal" (with "in favor" highlighted in green) and was the same as in the one-sided frame condition. However, a second column was labeled "arguments against the proposal" (with "against" highlighted in red). The second column had no arguments in it and thus merely suggested that a second side had been considered (adapted from Rucker et al., 2008). The one-sided and two-sided message framing conditions can be found in the Supplemental Methodology File.

Criterion Variable: Attitudes. Participants answered three 9-point semantic differential scale items regarding their attitudes toward the proposal regarding Nazi's freedom of speech: *dislike-like*, *bad-good*, and *unfavorable-favorable*. Higher values represented more favorable attitudes toward the topic in the message ($\alpha = .93$, $M = 4.17$, $SD = 2.27$).

Results

Attitudes toward the proposal were submitted to a multiple linear regression with holistic thinking (centered), message frame (dummy coded), and the interaction term entered as predictors. Main effects analysis can be found in the SOM.

Most relevant, a significant two-way interaction between holistic thinking and message-sidedness frame on evaluation was obtained, $B = 0.343$, $t(477) = 2.279$, $p = .023$, 95% CI [0.047, 0.638], $f = 0.105$. As illustrated in Figure 4, among those with higher holistic thinking (analyzed one standard deviation above the mean), the message framed as two-sided tended to be more persuasive than the one-sided message, $B = 0.275$, $t(477) = 1.878$, $p = .061$, 95% CI [−0.013, 0.562]. However, for those with lower holistic thinking (analyzed one standard deviation below the mean), the one-sided message tended to be more persuasive than the message framed as two-sided, $B = -0.201$, $t(477) = -1.371$, $p = .171$, 95% CI [−0.489, 0.087], although neither of these simple slopes reached significance. In other words, participants higher in holistic thinking tended to respond more positively when the message was framed as considering both sides of the issue, whereas participants lower in holistic thinking showed a tendency toward the opposite pattern, with slightly more favorable attitudes toward the one-sided message. These opposite patterns resulted in a significant two-way interaction.

Discussion

Conceptually replicating the finding that an actually two-sided message with strong arguments is more effective for those higher in holistic thinking, the current study found that merely framing a one-sided message as two-sided was also more effective for those higher in holistic thinking. That is, matching holistic thinking style and message frame (one-sided frame vs. two-sided frame) enhanced persuasion even when the actual message content was maintained in the two-sided frame conditions. This is important because it suggests that the effect can arise based on participants' subjective perceptions of message sidedness, rather than depending entirely on the message's objective sidedness.

Study 3

The main goal of Study 3 was to provide further evidence of the matching effect obtained in Studies 1 and 2, but this time in a pre-registered experiment. Having shown the effect across two different topics and two different instantiations of this type of matching, we wanted to confirm the finding in a pre-registered study. We expected the same two-way interaction from the prior studies, showing that participants with higher levels of holistic thinking would be more persuaded when receiving a two-sided (vs. one-sided) version of a message containing strong arguments for the proposal.

Method

Participants and Design. We pre-registered collecting 400 participants given that we wanted to detect the effect even if it turned out to be smaller than anticipated. Fourteen participants failed the attention check, leaving a final sample of 386

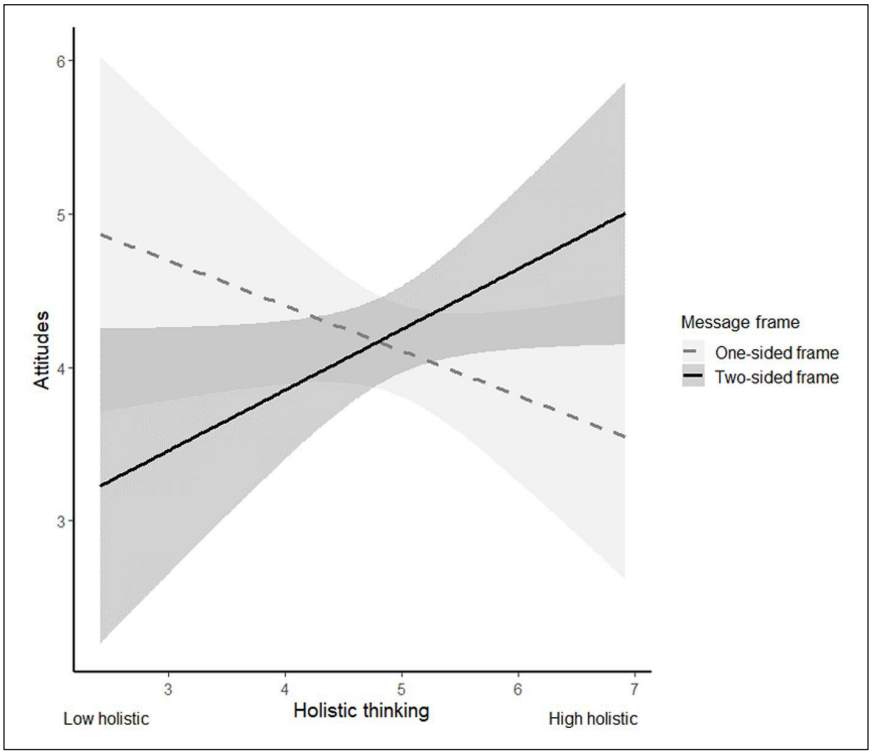

Figure 4. Attitudes toward the proposal as a function of Holistic Thinking and Message Frame in Study 2.

Connect CloudResearch participants (46.9% females and 53.1% males, M_{age} = 37.69, SD = 11.85). Participants were all residents of the United States. Holistic thinking (continuous variable) and message sidedness (dichotomous variable) were included as predictor variables, whereas attitudes toward the persuasive proposal were measured as the criterion variable. Based on a sensitivity analysis (conducted with G*Power), this sample size allowed us to detect effects equal to or higher than f = 0.141. This study was pre-registered (https://aspredicted.org/vt8f-993c.pdf).

Procedure. Permission to conduct the study was provided by the university institutional ethics committee before the study began. The research was introduced as a study designed to validate different experimental materials. Participants first completed a brief version of the DSS. Then, participants received either a one-sided or two-sided persuasive message in favor of Nazi's freedom of speech. Attitudes toward the proposal were assessed and served as the dependent measure. Finally, participants answered several demographic questions and were thanked and debriefed.

Independent/Predictor Variables

Holistic Thinking. Participants' holistic thinking was measured using the same scale as in Study 1, the DSS-14 (DSS-14; Spencer-Rodgers et al., 2015). The reliability in this sample was adequate (α = .88). Although the scale was measured before the experimental inductions, we still ensured that random assignment was successful by showing that holistic thinking scores did not differ as a function of the message sidedness manipulation (p = .321). Higher scores indicated greater holistic thinking (M = 3.21, SD = 0.94).

Message Sidedness. After completing the DSS, participants were randomly assigned to receive either a one- or two-sided message using the same topic as Study 2. The one-sided message provided three strong arguments in support of allowing Nazis to speak in U.S. high schools. This message was identical to the one used in the previous study. In contrast, the two-sided message presented the same arguments but also briefly acknowledged the opposing viewpoint, which is that White nationalist hate speech might be deemed inappropriate for high school students. In both versions, the author ultimately concluded that Nazis should have the right to speak in U.S. high schools. The two-sided message presented the same arguments and then briefly acknowledged reasons why some people might oppose Nazi's freedom of speech, closing with: "Nevertheless, it is understandable that many think that white nationalist hate speech is too much for our democracy to bear, especially for high school students. Some believe that racist demonstrations and hate speech should be illegal because they are profoundly offensive and inflict harm on affected minorities" (see the Supplemental Methodology File for the full messages). This manipulation was identical to the one used in previous research (Xu & Petty, 2022).

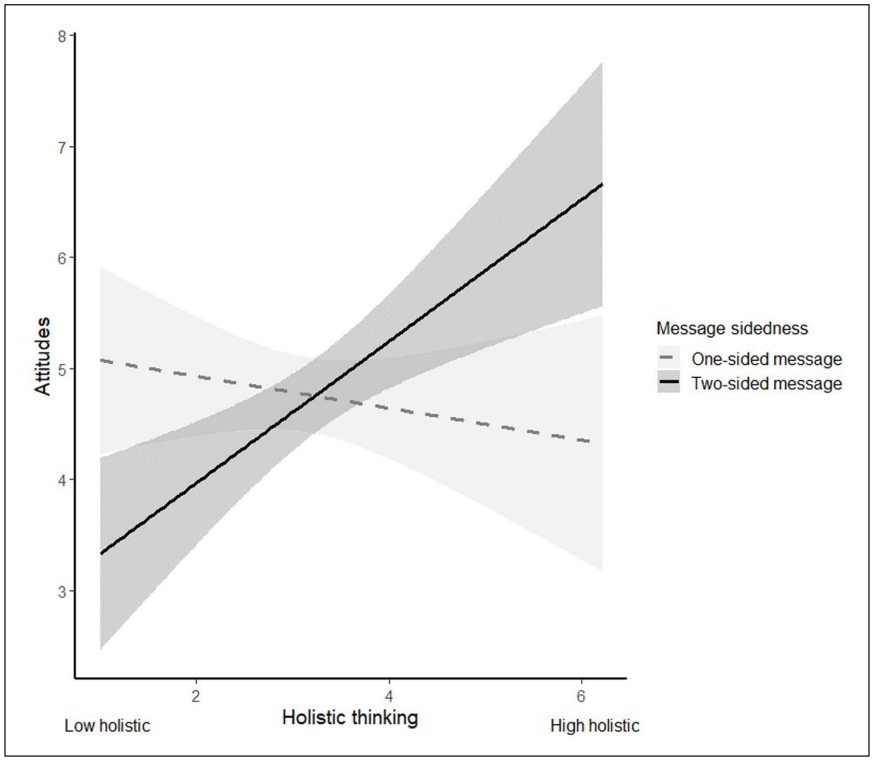

Figure 5. Attitudes as a function of holistic thinking and message sidedness in Study 3.

Criterion Variable: Attitudes Toward the Proposal. Participants answered three 9-point semantic differential scales regarding the proposal of Nazi's freedom of speech: *negative-positive*, *unfavorable-favorable*, and *dislike-like*. Higher values represented more positive attitudes in the direction of the advocacy ($\alpha = .89$, $M = 4.76$, $SD = 2.39$).

Results

Attitudes were submitted to a multiple regression with holistic thinking (centered), message sidedness (dummy coded), and the interaction term entered as predictors. Main effects analysis can be found in the SOM.

Importantly, a significant two-way interaction between holistic thinking and message sidedness on attitudes was obtained, $B = 0.391$, $t(382) = 3.052$, $p = .002$, 95% CI [0.139, 0.644], $f = 0.155$. As illustrated in Figure 5, among those with higher holistic thinking (analyzed one standard deviation above the mean), the two-sided message was more persuasive than the one-sided message, $B = 0.358$, $t(382) = 2.102$, $p = .036$, 95% CI [0.023, 0.692]. However, for those with lower holistic thinking (analyzed one standard deviation below the mean), the one-sided message was more persuasive than the two-sided message, $B = -0.377$, $t(382) = -2.217$, $p = .027$, 95% CI [−0.711, −0.043]. In other words, participants responded more favorably to messages that matched their thinking style: those higher in holistic thinking preferred two-sided messages, whereas those lower in holistic thinking (i.e., more analytic individuals) preferred one-sided messages.

Discussion

Having demonstrated the matching effect across two different topics and two different instantiations of this type of matching, this pre-registered study, designed with enough power, successfully replicated the core result, providing convergent evidence for the reliability and generalizability of the personalized matching effect.

General Discussion

This research demonstrated an interaction between individual differences in holism and message sidedness across different topics and also provided evidence for the underlying mechanism. Study 1 demonstrated that holistic thinkers were more persuaded by two-sided messages with strong arguments compared to one-sided messages, and uncovered the underlying process (as illustrated by matching message sidedness to holism enhancing attitudinal differences to argument quality). This study also demonstrated a consequence of this enhanced thinking, showing greater attitude-behavioral intentions correspondence under high vs. low elaboration conditions. Study 2 tested the generalizability of the effect, revealing that simply framing a one-sided message as two-sided, while keeping the actual content constant, was

sufficient to produce the predicted matching effect. Finally, Study 3 replicated the core personalized matching effect in a pre-registered study (see Supplemental Material for analysis on the collapsed dataset).

This research contributes to the literature on attitudes and persuasion by focusing on the underlying mechanisms of personalized matching and by demonstrating downstream consequences. Thus, this work is added to the scarce literature on matching effects that identifies the psychological mechanism through which the matching is operating (Briñol & Petty, 2025). Of course, it is important to note that matching will not always produce more consequential attitudes—only when the match is associated with more thinking than mismatching. If for some reason a mismatch were to lead to more thinking than a match, then the downstream consequences would be reversed. Matching is more likely to increase elaboration when it enhances the perceived personal relevance, the diagnosticity, or the fluency of the message for the recipient, thereby motivating greater interest and subsequent thinking. In contrast, matching could reduce (rather than increase) elaboration when it is interpreted as signaling that the information is already known, redundant, or insufficiently novel to warrant careful processing. Furthermore, matching can potentially undermine processing when it is perceived negatively (e.g., as overly tailored or invasive, which can trigger resistance or reduced engagement; Fransen et al., 2015; Kim et al., 2019). Elaboration could also be reduced when messages match recipients' expectations about their content (Smith & Petty, 1996) or when it targets an undesired or invalidating aspect of the self (Derricks & Earl, 2019).

One limitation of the current research is that it relied on behavioral intentions rather than a behavioral outcome. Although behavioral intentions are generally strong predictors of actual behavior (Fishbein & Ajzen, 2010), future research would benefit from examining whether the observed effects extend to actual behavior and to other strength outcomes such as stability and resistance. Future studies could also expand from examining message *processing* to message *production* (e.g., holistic thinkers may be more likely to generate two-sided arguments when persuading others, or even when engaging in self-persuasion; Briñol et al., 2025).

All samples were drawn from U.S. participants, and future research should examine the cultural generalizability of the observed effects. Although holistic-analytic thinking captures individual differences within cultures, it is also embedded in broader cultural differences, raising questions about whether matching effects emerge across cultural contexts and whether their magnitude or mechanisms vary. Study 2 further suggests that this effect depends more on the subjective perception that both sides are considered than on objective message balance, implying that cultural differences may operate by shaping the cues people use to infer whether a message is genuinely balanced.

Moreover, future research should examine to what extent other individual differences beyond holistic and dialectical thinking can also match with two-sided messages, including *need for cognitive closure* (Kruglanski & Webster, 1996), *critical thinking disposition* (Facione et al., 1995), *intellectual humility* (Güngör et al., 2024), *openness to experience* (Stumm, 2018), *receptiveness to opposing views* (Minson & Chen, 2022) or *open-minded cognition* (Ottati & Stern, 2023). Each of these constructs captures aspects of how individuals process information with an open-minded mindset, but they differ in their motivational, affective, or epistemic underpinnings from holistic thinking (Briñol & Petty, 2023). For instance, a critical thinker may enjoy considering both sides of an argument, but for different reasons than a dialectical thinker—namely, to arrive at a single best conclusion or to obtain mental closure unrelated to contradictions. A promising direction for future research in this area would be further specifying whether other individual differences potentially related to openness can also match to message sidedness and if so, identifying what are the unique features underlying any of those potential forms of personalized matching. Moreover, additional work could more explicitly examine whether the observed matching effects depend on recipients' desire for balance, experience of conflict, tolerance for contradiction, preference for complexity, or a combination of them (Santos, Requero, & Martín-Fernández, 2025a; Santos, Requero, Moreno, et al., 2025).

In closing, it is important to note that the present studies focused on providing clear evidence for what kind of message matches individual differences in holism and also explaining how this matching works as a matter of impacting processes of primary cognition (i.e., the amount of thinking). However, future studies could benefit from assessing how this same type of personalized persuasion can also operate through other processes, such as the match serving as a simple positive cue or by impacting secondary cognition (i.e., affecting the perceived validity of thoughts). This distinction between primary and secondary cognition can be as important as the distinctions made within primary cognition (high vs. low elaboration) because matching can lead to different (even opposite) effects depending on whether it affects attitudes by changing primary thoughts or by changing what people think about those thoughts (Briñol & Petty, 2025).

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Supplemental Material

Supplemental material is available online with this article.

Note

1. For individuals high in holism, careful processing of the message could lead them to move away from the advocated position when the opposing side is also strong. Conversely, if the opposing side were weak, they could be more likely to align with the original position. However, it is also possible that the primary factor influencing their stance is the extent to which they carefully process the arguments on the first side, regardless of the strength of the opposing side. All things considered, we decided to vary the strength of both sides for the two-sided message conditions, with both sides being strong in the strong condition, and both sides being weak in the weak condition.

References

Briñol, P., Burton, B. S., Santos, D., & Petty, R. E. (2025). Strengthening personalized matching by targeting persuasive messages to strong traits of the recipient. *Cogent Psychology*, *12*(1), Article 2545290. https://doi.org/10.1080/23311908.2025.2545290

Briñol, P., & Petty, R. E. (2023). Openness and persuasion: Multiple processes, meanings, and outcomes. In V. C. Ottati & C. Stern (Eds.), *Divided: Open-mindedness and dogmatism in a polarized world* (pp. 59–77). Oxford University Press.

Briñol, P., & Petty, R. E. (2025). Mechanisms of personalized persuasion: Multiple processes, meanings, and outcomes. In R. E. Petty, A. Luttrell, & J. D. Teeny (Eds.). *The handbook of personalized persuasion: Theory and application*. Taylor and Francis.

Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology*, *42*(1), 116–131. https://doi.org/10.1037/0022-3514.42.1.116

Cacioppo, J. T., Petty, R. E., Kao, C. F., & Rodriguez, R. (1986). Central and peripheral routes to persuasion: An individual difference perspective. *Journal of Personality and Social Psychology*, *51*(5), 1032–1043. https://doi.org/10.1037/0022-3514.51.5.1032

Cancela, A., Briñol, P., & Petty, R. E. (2021). Hedonic vs. epistemic goals in processing persuasive communications: Revisiting the role of personal involvement. *Motivation and Emotion*, *45*(3), 280–298. https://doi.org/10.1007/s11031-021-09873-7

Choi, I., Koo, M., & Choi, J.-A. (2007). Individual differences in analytic versus holistic thinking. *Personality and Social Psychology Bulletin*, *33*(5), 691–705. https://doi.org/10.1177/0146167206298568

Crowley, A. E., & Hoyer, W. D. (1994). An integrative framework for understanding two-side persuasion. *Journal of Consumer Research*, *20*, 561–574. https://doi.org/10.1086/209370

DeBono, K. G., & Harnish, R. J. (1988). Source expertise, source attractiveness, and the processing of persuasive information: A functional approach. *Journal of Personality and Social Psychology*, *55*(4), 541–546. https://doi.org/10.1037/0022-3514.55.4.541

Derricks, V., & Earl, A. (2019). Targeting increases the weight of stigma: Leveraging relevance backfires when people feel judged. *Journal of Experimental Social Psychology*, *82*, 277–293. https://doi.org/10.1016/j.jesp.2018.12.003

Ein-Gar, D., Shiv, B., & Tormala, Z. L. (2012). When blemishing leads to blossoming: The positive effect of negative information. *Journal of Consumer Research*, *38*(5), 846–859. https://doi.org/10.1086/660807

Facione, P. A., Sanchez, C. A., Facione, N. C., & Gainen, J. (1995). The disposition toward critical thinking. *The Journal of General Education*, *44*(1), 1–25. https://doi.org/10.3928/0148-4834-19941001-05

Finkel, E. J., Bail, C. A., Cikara, M., Ditto, P. H., Iyengar, S., Klar, S., Mason, L., McGrath, M. C., Nyhan, B., Rand, D. G., Skitka, L. J., Tucker, J. A., Van Bavel, J. J., Wang, C. S., Druckman, J. N., & Tucker, J. A. (2020). Political sectarianism in America. *Science*, *370*(6516), 533–536. https://doi.org/10.1126/science.abe1715

Fransen, M. L., Smit, E. G., & Verlegh, P. W. J. (2015) Strategies and motives for resistance to persuasion: an integrative framework. *Frontiers in Psychology*, *6*, Article 1201. https://doi.org/10.3389/fpsyg.2015.01201

Fujita, K., Eyal, T., Chaiken, S., Trope, Y., & Liberman, N. (2008). Influencing attitudes toward near and distant objects. *Journal of Experimental Social Psychology*, *44*(3), 562–572. https://doi.org/10.1016/j.jesp.2007.10.005

Gallup. (2025, January 16). *U.S. political parties remain historically polarized ideologically*. https://news.gallup.com/poll/655190/political-parties-historically-polarized-ideologically.aspx

Güngör, M., Kayatepe, E., Özman, N., Şencan, R. S., & Saribay, S. A. (2024). Are holistic thinkers intellectually humbler? A first test. *Personality and Individual Differences*, *230*, Article 112775. https://doi.org/10.1016/j.paid.2024.112775

Hovland, C. I., Lumsdaine, A. A., & Sheffield, F. D. (1949). *Experiments on mass communication (Studies in social psychology in World War II)*. Princeton University Press.

Kallgren, C. A., & Wood, W. (1986). Access to attitude-relevant information in memory as a determinant of attitude-behavior consistency. *Journal of Experimental Social Psychology*, *22*(4), 328–338. https://doi.org/10.1016/0022-1031(86)90018-1

Kao, D. T. (2011). Message sidedness in advertising: The moderating roles of need for cognition and time pressure in persuasion. *Scandinavian Journal of Psychology*, *52*, 329–340. https://doi.org/10.1111/j.1467-9450.2011.00882.x

Kim, T., Barasz, K., & John, L. K. (2019). Why am I seeing this ad? The effect of ad transparency on ad effectiveness, *Journal of Consumer Research*, *45*(5), 906–932. https://doi.org/10.1093/jcr/ucy039

Knight, N., & Nisbett, R. (2007). Culture, class and cognition: Evidence from Italy. *Journal of Cognition and Culture*, *7*(3–4), 283–291. https://doi.org/10.1163/156853707x208512

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). Lawrence Erlbaum Associates.

Kruglanski, A. W., & Webster, D. M. (1996). Motivated closing of the mind: "Seizing" and "freezing." *Psychological Review*, *103*(2), 263–283. https://doi.org/10.1037/0033-295x.103.2.263

Leippe, M. R., & Elkin, R. A. (1987). When motives clash: Issue involvement and response involvement as determinants of persuasion. *Journal of Personality and Social Psychology*, *52*(2), 269–278. https://doi.org/10.1037/0022-3514.52.2.269

Luttrell, A., Petty, R. E., Chang, J. H., & Togans, L. J. (2022). The role of dialecticism in objective and subjective attitudinal

ambivalence. *British Journal of Social Psychology*, *61*(3), 826–841. https://doi.org/10.1111/bjso.12504

Martín-Fernández, M., Requero, B., Zhou, X., Gonçalves, D., & Santos, D. (2022). Refinement of the Analysis-Holism Scale: A cross-cultural adaptation and validation of two shortened measures of analytic versus holistic thinking in Spain and the United States. *Personality and Individual Differences*, *186*, Article 111322. https://doi.org/10.1016/j.paid.2021.111322

Minson, J. A., & Chen, F. S. (2022). Receptiveness to opposing views: Conceptualization and integrative review. *Personality and Social Psychology Review*, *26*(2), 93–111. https://doi.org/10.1177/10888683211061037

Nisbett, R. E., & Masuda, T. (2003). Culture and point of view. *Proceedings of the National Academy of Sciences*, *100*(19), 11163–11170. https://doi.org/10.1073/pnas.1934527100

Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: Holistic versus analytic cognition. *Psychological Review*, *108*(2), 291–310. https://doi.org/10.1037/0033-295x.108.2.291

O'Keefe, D. J. (1999). How to handle opposing arguments in persuasive messages: A meta-analytic review of the effects of one-sided and two-sided messages. *Communication Yearbook*, *22*(1), 209–249. https://doi.org/10.1080/23808985.1999.11678963

Ottati, V. C., & Stern, C. (Eds.) (2023). *Divided: Open-mindedness and dogmatism in a polarized world*. Oxford University Press.

Peng, K., & Nisbett, R. E. (1999). Culture, dialectics, and reasoning about contradiction. *American Psychologist*, *54*(9), 741–754. https://doi.org/10.1037/0003-066x.54.9.741

Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. *Advances in Experimental Social Psychology*, *19*, 123–205. https://doi.org/10.1016/s0065-2601(08)60214-2

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., Haugtvedt, C., & Smith, S. M. (1995). Elaboration as a determinant of attitude strength: Creating attitudes that are persistent, resistant, and predictive of behavior. In R. E. Petty & J. A. Krosnick (Eds.), *Attitude strength: Antecedents and consequences* (pp. 93–130). Lawrence Erlbaum Associates.

Petty, R. E. & Krosnik, J. A. (Eds.) (1995). *Attitude strength: Antecedents and consequences.* Lawrence Erlbaum Associates.

Petty, R. E., Luttrell, A., & Teeny, J. D. (Eds.). (2025). *The handbook of personalized persuasion: Theory and application*. Routledge (Taylor & Francis Group).

Petty, R. E., Siev, J. J., & Briñol, P. (2023). Attitude strength: What's new. *Spanish Journal of Psychology*, *26*, e4, 1–13. https://doi.org/10.1017/sjp.2023.7

Petty, R. E., & Wegener, D. T. (1998). Matching versus mismatching attitude functions: Implications for scrutiny of persuasive messages. *Personality and Social Psychology Bulletin*, *24*(3), 227–240. https://doi.org/10.1177/0146167298243001

Pew Research Center. (2023, December 7). *Beyond polarization: How Americans view the problems facing the country, the tone of political debate and people with different political views*. https://www.pew.org/en/research-and-analysis/articles/2023/10/27/beyond-polarization?utm_source=chatgpt.com

Priester, J. R., & Petty, R. E. (1996). The gradual threshold model of ambivalence: Relating the positive and negative bases of attitudes to subjective ambivalence. *Journal of Personality and Social Psychology*, *71*, 431–449. https://doi.org/10.1037/0022-3514.71.3.431

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., Requero, B., & Martín-Fernández, M. (2021). Individual differences in thinking style and dealing with contradiction: The mediating role of mixed emotions. *PLoS ONE*, *16*(9), Article e0257864. https://doi.org/10.1371/journal.pone.0257864

Santos, D., Requero, B., & Martín-Fernández, M. (2025). Holism and causal responsibility: The role of number and valence of event consequences. *Personality and Social Psychology Bulletin*, *51*(3), 452–466. https://doi.org/10.1177/01461672231192827

Santos, D., Requero, B., Moreno, L., Briñol, P., & Petty, R. (2025). Certainty in holistic thinking and responses to contradiction: Dialectical proverbs, counter-attitudinal change and ambivalence. *British Journal of Social Psychology*, *64*(1), e12782. https://doi.org/10.1111/bjso.12782

See, Y. H. M., Petty, R. E., & Fabrigar, L. R. (2013). Affective–cognitive meta-bases versus structural bases of attitudes predict processing interest versus efficiency. *Personality and Social Psychology Bulletin*, *39*(8), 1111–1123. https://doi.org/10.1177/0146167213490807

Shapiro, J. P., Dorman, R. L., Burkes, W. M., Welker, C. J., & Clough, J. B. (1997). Development and factor analysis of a measure of youth attitudes toward guns and violence. *Journal of Clinical Child Psychology*, *26*(3), 311–320. https://doi.org/10.1207/s15374424jccp2603_10

Smith, S. M., & Petty, R. E. (1996). Message framing and persuasion: A message processing analysis. *Personality and Social Psychology Bulletin*, *22*, 257–268. https://doi.org/10.1177/0146167296223004

Snyder, M. (1979). Self-monitoring processes. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 12, pp. 85–128). Academic Press.

Snyder, M., & DeBono, K. G. (1985). Appeals to image and claims about quality: Understanding the psychology of advertising. *Journal of Personality and Social Psychology*, *49*(3), 586–597. https://doi.org/10.1037/0022-3514.49.3.586

Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology*, *89*(6), 845–851. https://doi.org/10.1037/0022-3514.89.6.845

Spencer-Rodgers, J., Anderson, E., Ma-Kellams, C., Wang, C., & Peng, K. (2018). What is dialectical thinking? Conceptualization and measurement. In J. Spencer-Rodgers & K. Peng (Eds.), *The psychological and cultural foundations of East Asian cognition: Contradiction, change, and holism* (pp. 1–34). Oxford University Press.

Spencer-Rodgers, J., & Peng, K. (2017). The dialectical self: Contradiction, change, and holism in the East Asian cultural context. In C. S. Crandall & V. L. Cheung (Eds.), *The Oxford handbook of cultural neuroscience* (pp. 167–184). Oxford University Press.

Spencer-Rodgers,J.,Peng,K.,Wang,L.,&Hou,Y.(2004).Dialectical self-esteem and East-West differences in psychological well-being. *Personality and Social Psychology Bulletin*, *30*(11), 1416–1432. https://doi.org/10.1177/0146167204264243

Spencer-Rodgers, J., Srivastava, S., Boucher, H. C., English, T., Paletz, S. B., & Peng, K. (2015). *Dialectical self scale*. PsycTESTS.

Stumm, S. (2018). Better open than intellectual: The benefits of investment personality traits for learning. *Personality and Social Psychology Bulletin*, *44*(4), 62–573. https://doi.org/10.1177/0146167217744526

Teeny, J. D., Siev, J. J., Briñol, P., & Petty, R. E. (2021). A review and conceptual framework for understanding personalized matching effects in persuasion. *Journal of Consumer Psychology*, *31*(2), 382–414. https://doi.org/10.1002/jcpy.1198

Verplanken, B. (1991). Persuasive communication of risk information: A test of cue versus message processing effects in a field experiment. *Personality and Social Psychology Bulletin*, *17*(2), 188–193. https://doi.org/10.1177/014616729101700211

Wan, E. W., & Rucker, D. D. (2013). Confidence and construal framing: When confidence increases versus decreases information processing. *Journal of Consumer Research*, *39*(5), 977–992. https://doi.org/10.1086/666467

Wheeler, S. C., Petty, R. E., & Bizer, G. Y. (2005). Self-schema matching and attitude change: Situational and dispositional determinants of message elaboration. *Journal of Consumer Research*, *31*(4), 787–797. https://doi.org/10.1086/426613

Xu, M., & Petty, R. E. (2022). Two-sided messages promote openness for morally based attitudes. *Personality and Social Psychology Bulletin*, *48*(8), 1150–1164. https://doi.org/10.1177/0146167220988371

Xu, M., & Petty, R. E. (2024). Two-sided messages promote openness for a variety of deeply entrenched attitudes. *Personality and Social Psychology Bulletin*, *50*(2), 215–231. https://doi.org/10.1177/01461672221128113