

What's in a frame anyway?: A meta-cognitive analysis of the impact of one versus two sided message framing on attitude certainty

Derek D. Rucker^{a,*}, Richard E. Petty^b, Pablo Briñol^c

^a Kellogg School of Management, Northwestern University, USA

^b Ohio State University, USA

^c Universidad Autónoma de Madrid, Campus Cantoblanco, Madrid 28049, Spain

Received 20 January 2008

Available online 14 March 2008

Abstract

The current research examines a potentially new strategy to increase attitude certainty: framing messages as two sided. That is, we explore the consequences of articulating that others have considered both the positives and negatives of a message position, in the absence of any real differences in substantive content presented. Although classic research and theory appear to assume no clear benefit for simply framing a message as two sided, we develop and apply a meta-cognitive approach that predicts advantages for such messages with respect to attitude certainty and attitude-behavior correspondence.

© 2008 Society for Consumer Psychology. Published by Elsevier Inc. All rights reserved.

One topic that has received considerable attention within the persuasion literature is whether persuaders can enhance their influence by presenting some drawbacks to their product or proposal. This can be seen clearly in work on one-sided versus two-sided appeals (e.g., Hovland, Janis, & Kelly, 1953). In the former, only positive information is given, whereas in two-sided messages, a source discloses not only positive information, but some negative information as well (e.g., Bohner, Einwiller, Erb, & Sibler, 2003; Kamins & Marks, 1987; Pechmann, 1992; Sawyer, 1973).

Although research on one-sided versus two-sided persuasion easily occupies volumes, there is an interesting caveat to this body of work. Prior investigations have not considered the effects of separating whether a message is simply *framed* as one-sided versus two-sided from the actual content of the message. That is, relative to a one-sided message, a two-sided message is accompanied by negative information, which gives it the label “two-sided,” though sometimes this information is also discounted (e.g., Lumsdaine & Janis, 1953). However, what if the same message is simply framed as being based on the consideration of one or two sides, but presents the same substantive information? For example, consider a movie that receives only praise from movie critics Ebert and Roeper.

Should the movie be marketed by simply highlighting the positive opinions of these critics, or might there be a benefit to reminding the audience that Ebert and Roeper are critics who consider both the positives and negatives of the films they view?

Similarly, there is clear variance in how websites provide shoppers with other consumers' opinions about a product. At *Epinions.com*, feedback about the product is separated into the pros and cons for each user, making it clear that both the good and bad points of the product have been solicited and taken into consideration. *Amazon.com* lists general user feedback making it less clear whether users were encouraged to provide both their positive and negative responses. Consequently, two reviews can contain substantively equivalent information but differ in how salient it is that both positive and negative information about the product has been considered. An interesting question for consumer research is, if the same substantive product attributes are to be presented, does it matter whether a consumer perceives the message to be a result of considering one versus both sides? We refer to how the message is presented, as opposed to the actual content of the message, as *one-sided versus two-sided framing*.

To our knowledge, evidence for the effects of one-sided versus two-sided framing of the same message is absent. This might be due in part to a) an emphasis on differences in the content of one-sided versus two-sided messages, b) a failure to consider that consumers' perceptions of how others *reached* an attitude or

* Corresponding author.

E-mail addresses: d-rucker@kellogg.northwestern.edu (D.D. Rucker), petty.1@osu.edu (R.E. Petty), pablo.brinnol@uam.es (P. Briñol).

opinion could influence persuasion, and c) the lack of any theoretical framework for predicting differences due to this type of message framing. Nevertheless, we hypothesized consumers are sensitive to the format of messages with respect to one-sided versus two-sided framing and this framing can play a crucial role in persuasion. Furthermore, we propose that this type of message framing can have important implications for the amount of certainty people attach to their attitudes.

A meta-cognitive perspective on one versus two sided framing

Advances in meta-cognition—thinking about thinking (e.g., Alba & Hutchinson, 2000; Lee, 2004; Petty, Briñol, Tormala, & Wegener, 2007; Schwarz, 2004; Wright, 2002)—can potentially shed light on how consumers might respond to one-sided versus two-sided framing. Work on meta-cognition has begun to examine consumers' beliefs about how they reached an attitude or opinion. This work has shown that such beliefs can influence the underlying certainty people express in their attitudes. Attitude certainty is a meta-cognition, as it is a secondary cognition (i.e., “How certain am I of my attitude?”) about a primary cognition (i.e., “My attitude towards this product is positive.”). For example, Tormala and Petty (2002) found that individuals who successfully defended their attitudes reported greater certainty in their attitudes when they perceived themselves to have resisted a strong, as opposed to a weak, attack. Rucker and Petty (2004) found that when persuaded by a very strong message, people reported being more certain of their attitudes when they had made an effort to consider the faults as opposed to having processed the message in a more objective fashion. Common to both paradigms is that consumers' beliefs about how they reached their attitudes influenced the certainty they attached to those attitudes. The inference process itself is meta-cognitive in nature as it reflects consumers' perceptions of their own cognitive processes in reaching their attitudes (Petty et al., 2007).

Since it matters how consumers think they formed their own opinions, we argue that consumers might also consider how *others* have reached an opinion. Specifically, making it salient to consumers that both sides have been considered by *someone else* (i.e., a two-sided-frame) could lead consumers to make a conscious and thoughtful inference that their attitudes are based upon greater knowledge (i.e., they reached their evaluation by knowing not only the positives, but also the potential negatives). We predicted that a two-sided frame would influence how certain individuals would be regarding the attitudes they reached. In particular, when it is clear that a source has considered the negatives as well as the positives, and the negatives presented are either absent or few and inconsequential, we propose consumers may intuit that there must be few remaining unknown negative attributes; therefore they can be confident in the positive evaluation of the message position. If there is no indication of consideration of negative factors, people might intuit their attitudes are based on less complete knowledge, and thus will be less certain of the attitude formed. We propose this reflects a thoughtful inference process whereby people consider the completeness of their knowledge in determining their certainty.

Indeed, recent research suggests that when a message only presents one-sided attributes (positive or negative), people some-

times assume that there might be opposite attributes of which they are unaware (Priester, Petty, & Park, 2007). In one study, for example, Priester et al. varied the amount of univalent information participants received such that either one or seven pieces of positive or negative information was presented. Priester and colleagues found that participants reported feeling more ambivalent/uncertain when they received one piece of information as opposed to seven, and this uncertainty was mediated by beliefs about the existence of missing information of the opposite valence. Furthermore, when people are directly prompted to consider potentially missing information, they evince less confidence in their evaluations (Sanbonmatsu, Kardes, & Herr, 1992). An alternative way to view these findings is that if increasing perception of missing information increases ambivalence or uncertainty, then any variable that reduces perception of missing information should increase certainty.

Although we expected our two-sided framing manipulation to affect perceptions of certainty for the reasons outlined above, we did not expect effects on the extremity of the attitude for three reasons. First, and perhaps most obviously, in past research varying knowledge about a topic, attitude extremity was tied largely to the actual content of the information provided. For example, when people were exposed to more positive attributes about a product or issue, they were more knowledgeable and more persuaded (e.g., Petty & Cacioppo, 1984). In our research, only perceptions of knowledge will be varied since the one and two-sided messages present the same content to message recipients. Second, prior research has suggested that when arguments are unambiguously strong, mere perceptions of knowledge in the absence of actual knowledge differences are less likely to influence the extremity of one's evaluation (e.g., Rucker & Petty, 2004). This is because when arguments are clearly strong and are easily processed, individuals are readily able to determine their evaluative reaction. However, whether one can trust that evaluation might require input from additional sources (e.g., “Do I have all the information?”). Third, in general, perceptions of knowledge have been shown to be more strongly associated with the certainty of attitudes rather than the extremity of attitudes (Krosnick, Boninger, Chuang, Berent, & Carnot, 1993). The logic for this is that feeling one is better informed does not signal that one should take a more extreme position but that one can be more confident in the attitude reached. Thus, our effects were expected to be found primarily on attitude certainty. The finding of effects on attitude certainty in the absence of extremity differences is also a methodological advantage because if our manipulation affected both extremity and certainty, inferences of certainty could plausibly stem from the extremity of the attitude itself.

In short, we argue that when a source indicates that negatives have been considered, concern over possibly missing negative information can be put aside and people can feel more knowledgeable and therefore more certain. Put differently, even though consumers' actual thoughts about a product might be similar in one and two-sided framing conditions, leading to similarly valenced attitudes toward the product, their perception of how the message was developed might prompt them to reach different conclusions about their knowledge regarding their evaluation, which might lead them to become more or less certain in the evaluation formed. Positive attitudes will be held

with greater certainty when consumers can infer that their attitudes are based not only on the positive information they are aware of but also the fact there are likely to be few negative features of a product of which they are unaware.

The study of attitude certainty is an important domain of inquiry in the persuasion literature because of the numerous consequences of certainty. Attitudes held with certainty exert a stronger influence on behavior than attitudes held with less certainty (Berger, 1992; Fazio & Zanna, 1978; Krishnan & Smith, 1998; Rucker & Petty, 2004), are more likely to persist over time (Bassili, 1996) and are more likely to be resistant to attempts to change them (Petrocelli, Tormala, & Rucker, 2007; Tormala & Petty, 2002). If a company wishes to create loyal customers or politicians wish to create dedicated voters who are less likely to be swayed by competitors, instilling attitudes with certainty is one means of accomplishing this.

Of course, it first remains to be seen whether our reasoning is correct. It could be, for instance, that consumers are insensitive to manipulations of message framing involving whether others have focused on one or both sides of an issue, or, even if sensitive, framing might not affect people's assessments of their knowledge and certainty. Similarly, given a manipulation of message framing highlights what another person has done, or purported to have done, a message recipient might not be inclined to use this information as they would use information about their own attempts to consider both sides (Rucker & Petty, 2004). Thus, the first goal of our research was to examine if framing a message as one or two sided influences attitude certainty.

Experiment 1 tests the proposition that framing a message as two-sided enhances attitude certainty. Experiment 2 examines the moderating role of a consumer's self-reported category knowledge. Experiment 3 directly manipulates the perception both sides have been considered and examines a potential alternative interpretation. Experiment 4 examines whether the effects are due to a simple cue or a more complex association process. Finally, Experiment 5 tests whether two-sided framing enhances attitude-behavior correspondence over one-sided framing, a classic consequence associated with attitude certainty.

Pilot testing

Although we did not anticipate changes in the extremity of people's evaluations as a result of our framing manipulation, we conducted pilot-testing to further guard against changes in extremity. Past research has shown that presenting a substantive two-sided message (i.e., presenting arguments against one's position) can increase attitude change by increasing the credibility of the source (Kamins & Marks, 1987). Although it was not clear whether simply framing a message as two-sided, where no negative information is actually presented, would affect the perceived credibility of the source, we nonetheless did two things to mitigate this possibility. First, we attempted to hold credibility constant by selecting sources that we felt would be perceived as relatively constant in credibility regardless of message framing. In particular, the source of the information for Experiments 1, 2, 3, and 5 was portrayed as either product-testers for, or employees of, *Consumer Reports*. In Experiment 4, the sources of the message

were students who were reported to have used the product for an extended period of time. In both of these cases we used individuals who were portrayed as knowledgeable about the product and who had little reason to be biased in their reporting of the information.

To further ensure our manipulation did not influence source credibility, we conducted a pilot test in which we exposed two separate groups of participants to each of our messages and asked them to evaluate the credibility of the sources. Specifically, participants were asked how credible and how trustworthy the individuals providing the feedback were (7-point scales). These items were highly correlated ($r = .71$ for student testers (Experiment 4), $r = .86$ for product testers (Experiments 1, 2, 3, and 5) and combined to form an aggregate measure of credibility. When a message came from product testers ($N = 33$), participants perceived the source of the feedback as equally credible regardless of whether the message was framed as one-sided ($M = 4.00$, $SD = 1.03$) or two-sided ($M = 3.50$, $SD = 1.72$; $t(31) = 1.00$, $p = .32$). For the student testers ($N = 52$), sources were also seen as equally credible for both the one-sided ($M = 4.10$, $SD = 1.52$) and two-sided framing conditions ($M = 3.83$, $SD = .94$; $t(50) = .77$, $p = .44$). Thus, our initial pilot testing confirmed that the message conditions used in the present research were unlikely to influence credibility of the source in a positive or a negative fashion.

Experiment 1

Experiment 1 tested the effect of one versus two-sided framing on attitude certainty. In addition, we tested whether the effect required that others find nothing wrong with the product or that others made an effort to consider both sides. That is, consumers might feel more certain following two-sided framing because they perceive *others* to have considered both sides, or they might feel more certain only if the others report finding absolutely nothing wrong. Based on the logic that the key input into consumers' perception of knowledge is the feeling that *others* have considered both the potential pros and cons of a message, we suspect that the findings will hold even when a slight negative is present. This assumption is tested in Experiment 1.

Method

Participants and design

One-hundred and nineteen undergraduates from a Midwestern university participated in exchange for partial course credit. The design of the experiment was a 2 (message frame: one-sided, two-sided) X 2 (degree of negativity: none, slight) between-participants design.

Procedure

Participants were given a packet of materials and asked to complete them as part of a study on advertising research. Participants read a page explaining the nature of the task followed by a presentation of the product description, a cordless telephone. Participants were told all information in the present experiment was taken from product testers in a study conducted by *Consumer Reports*. Finally, we assessed participants' attitudes and attitude certainty.

Independent variables

Message frame. In the one-sided framing condition participants read a brief blurb about the product that included mention of the extent of positive reviewer feedback. In the two-sided framing condition, participants learned of the positive reviewer feedback, but also received information about the extent, if any, of negative feedback.

Degree of negativity. All participants were told that there were 30 individuals who had used the product. In the absolutely no negative condition participants learned that all individuals were positive towards the product, whereas in the slight negative condition they learned that 29 were positive. We intentionally used only a slight amount of negative information in an effort to maintain equivalency in attitudes across conditions. In the one-sided framing condition participants were told that either all 30 reviewers were positive (no negatives condition), or that of the 30 reviewers, 29 were positive (slight negative condition). No mention was made of negatives. In contrast, in the two-sided framing condition they were told that 30 reviewers were positive and 0 were negative (no negatives condition), or of the 30 reviewers 29 were positive and 1 was negative (slight negative condition). Thus, all participants received the same substantive information, but the fact that negative reviews were possible was made salient in the two-sided framing condition.

Dependent variables

Attitudes. Attitudes were assessed using a composite of three semantic differential scales (good-bad, favorable-unfavorable, positive-negative; $\alpha = .92$). All scales ranged from 1 to 7 with negative descriptors anchored at 1 and positive descriptors anchored at 7.

Attitude certainty. Attitude certainty was assessed with a composite of two items ($\alpha = .81$). Participants were asked, “How certain are you of your attitude toward this product?” and “How convinced are you that your attitude toward this product is correct?” Both items were completed on 7-point scales with 1 = “not at all” and 7 = “extremely.” These items were adapted from past research (see Fazio & Zanna, 1978; Rucker & Petty, 2004).

Results

Attitudes

The data were analyzed using a series of 2 (message frame: one-sided, two-sided) X 2 (degree of negativity: none, slight) ANOVAS. Individuals tended to like the product more when there were no negatives ($M = 5.51$, $SD = .94$) as opposed to one negative ($M = 5.26$, $SD = .88$), but this difference was not reliable, $F(1, 115) = 2.44$, $p = .12$. This finding reinforces the idea that the slight negative was, as intended, weak. Participants had equally positive attitudes regardless of whether they received the one-sided ($M = 5.35$, $SD = .87$) or two-sided frame ($M = 5.42$, $SD = .97$), $F < 1$, *ns*. There was no message framing by degree of negativity interaction, $F < 1$, *ns*.

Attitude certainty

On the certainty measure, only a significant main effect of message framing emerged such that individuals who received the two-sided frame held their attitudes with greater certainty ($M = 5.30$, $SD = .81$) than individuals who received the one-sided frame ($M = 4.93$, $SD = 1.15$; $F(1, 115) = 4.08$, $p < .05$). There was no main effect of degree of negativity on attitude certainty ($F < 1$, *ns*) or an interaction ($F(1, 115) = 1.18$, $p = .28$).

Discussion

Experiment 1 found that message frame (one versus two-sided) significantly influenced consumers' attitude certainty. Participants reported greater certainty in their attitudes when the message highlighted that reviewers could have presented both sides, suggesting that both the positives and the negatives of the product were considered. Importantly, this was not simply a manifestation of differences in attitudes as there were no reliable differences on the attitude measure. Finally, the effect was not modified by whether there were zero negatives or one negative presented. This suggests the certainty effect does not rest solely upon highlighting the absolute absence of negatives in others' reports, but rather with the two-sided framing.

Experiment 2

Experiment 2 was designed to examine a potential moderator based on our framework. If framing a message as having presented both sides is influencing consumers' certainty via enhancing consumers' more general perception of their own knowledge, then our effects should be most likely to be observed when participants do not already have reason to perceive themselves to have knowledge. For instance, for those who perceive themselves to be knowledgeable about the product category, their perceptions of knowledge regarding their evaluation towards a particular product, and thus their certainty, can be derived from their own perceptions of knowledge about the category. Therefore, their knowledge about their evaluation should be less influenced by message framing. However, those who are low in general perceived knowledge about the product category, and are likely to need other inputs into how knowledgeable they are, should be more prone to be affected by message framing. To examine this possibility, we included an item to assess consumers' general self-perception of knowledge about the product category. Importantly, based on our perspective, it is not necessarily actual knowledge that should be as important in deriving one's certainty as is perceived knowledge. Finally, we used a bicycle as our target category to increase the generalizability of our results. Otherwise, the design of Experiment 2 was conceptually identical to Experiment 1.

Method

Participants and design

Ninety-three undergraduates from a Midwestern university participated in exchange for partial course credit. Participants were randomly assigned to conditions in a 2 (message framing):

one-sided, two-sided) X 2 (degree of negativity: none, slight), with self-reported category knowledge assessed continuously.

Procedure

Participants arrived to take part in a project on evaluating advertisements. All participants then received product information for the “Davinci” Bike. The information featured a description of the product purported to be supplied by *Consumer Reports*. The information by *Consumer Reports* indicated features of the product such as “lightweight titanium frame.” Next, participants were asked to report their attitudes and attitude certainty. Participants then engaged in approximately 15-minutes of unrelated tasks before finally being asked how much they generally knew about bicycles. Participants were then thanked and debriefed.

Independent variables

Message framing. The one-sided frame contained two columns labeled with a single header, “product specifications.” The two-sided frame also contained two columns but one was labeled “product pros” and the other labeled “product cons.” A sample of the one and two-sided message frame conditions for those who received one negative, is provided in the Appendix.

Degree of negativity. In the absolute no negative condition there was no negative information supplied about the product. Thus, the column labeled “product cons” was left blank in the two-sided frame condition. In the slight negative condition, the message indicated the product did not come with a water bottle, a feature pilot-testing indicated was slightly negative. In the one-sided frame condition this was placed at the start of the 2nd column under the overall heading of “product specifications.” This information occupied the same physical space in the two-sided frame condition, but the information fell under the “product cons” column. Thus, both groups received slightly undesirable information, but the two-sided frame condition highlighted more blatantly that both sides had been considered by *Consumer Reports*.

Self-reported category knowledge. To assess participants’ perception of how knowledgeable about the bike category they were, we asked participants, “In general, how much do you know about bicycles?” Participants’ responses were assessed on a 7-point scale anchored at 1=I know very little about bicycles, and 7=I know a lot about bicycles.

Dependent variables

Attitudes ($\alpha=.93$) and attitude certainty ($\alpha=.80$) were assessed as in Experiment 1.

Results

Analyses were conducted with ANOVA or, when the effects of self-reported category knowledge were examined, using regression with variables mean centered. Regression analyses were conducted in a hierarchical fashion, entering main effects in the first step, two-

way interaction in the second step, etc. First, because self-reported category knowledge was being used as an independent variable, we made sure this variable was not affected by the manipulations. There was no main effect of message framing ($F(1, 89)=2.79, p=.10$) or degree of negativity ($F(1, 89)=1.43, p=.23$) on reported category knowledge. Furthermore, there was no interaction between message framing and degree of negativity ($F<1, ns$).¹

Attitudes

There was no effect of message framing on attitudes as participants held positive attitudes in both the one ($M=5.04, SD=.84$) and two-sided ($M=5.37, SD=1.28$) framing conditions, $F(1, 89)=2.24, p=.14$. Furthermore, replicating Experiment 1, the inclusion of a slight negative did not influence attitudes ($F<1, ns$). There were no interactions of message framing with attitudes, message framing with knowledge, or a 3-way (all p 's $>.40$).

Attitude certainty

As in Experiment 1, participants reporting being more certain when receiving the two-sided frame ($M=5.29, SD=1.16$) compared to the one-sided frame ($M=4.78, SD=1.28; F(1, 89)=4.03, p<.05$). There was no effect of degree of negativity on attitude certainty or an interaction between message framing and degree of negativity (F 's $<1, ns$). However, as anticipated, regression analyses revealed the main effect of message framing was qualified by a significant message framing by self-reported category knowledge interaction ($t(89)=2.01, p<.05$). The interaction, depicted in Fig. 1, indicates the effect of message framing was more prevalent for those low in self-reported category knowledge. In fact, simple slopes analyses, using the procedures described by Aiken and West (1991), indicated the effect of message framing on certainty was significant for those low in self-reported category knowledge ($-1 SD; t(89)=2.60, p=.01$), but was not significant for those high in self-reported category knowledge ($+1 SD; t(89)=.26, p=.80$). There was no significant 3-way interaction ($p>.90$).

Discussion

Replicating Experiment 1, consumers were more certain when presented with a two-sided frame. This effect was qualified by consumers’ perceptions of knowledge about the product category. Those low in perceived category knowledge showed a differential influence of message framing. Those high in perceived category knowledge showed no effect of message framing suggesting they did not rely on whether others had considered both sides to determine their certainty, but presumably relied on the fact they felt knowledgeable about the category.

Experiment 3

Experiment 3 was conducted to provide a more direct test of the hypothesis that the first step in our proposed reasoning

¹ Because the question asked about the product category rather than the particular bicycle, we expected this measure to be more stable and unaffected by the message frame or degree of negativity for the particular bicycle.

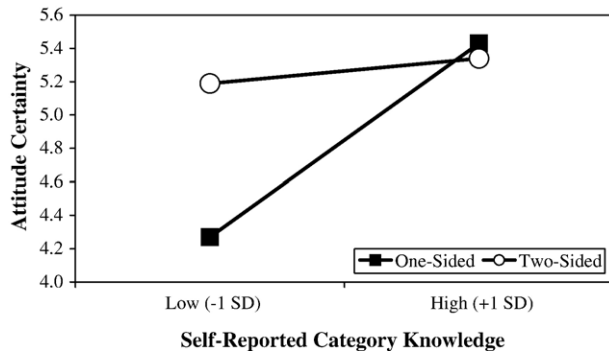


Fig. 1. Experiment 2 message framing by self-reported category knowledge on attitude certainty.

process is indeed the perception others have considered both sides. Specifically, we manipulate the perception that others have considered both sides by informing participants, in the two-sided condition, that consumers had been explicitly asked to consider both the positive and negatives of the product. This manipulation allows us to test the notion certainty is increasing from the fact others had considered both sides rather than any other qualities of the message itself. In addition, we examine whether our effects might be explained by the perception that people view the source as less biased when both sides appeared to have been considered. On the one hand, people might be more certain of their evaluation because they view the source as less biased when both sides are presented. On the other hand, given sources in our study ultimately make the same recommendation, people might not view any differences in the bias (or view them as equal in bias). Indeed, our pilot testing of the framing manipulation described earlier indicated that this manipulation did not lead to differential perceptions of source credibility (i.e., the sources' expertise or trustworthiness). Nonetheless, Experiment 3 examined source credibility and also included more specific measures of perceived bias.

Method

Participants and design

Twenty-eight undergraduates from a private Midwestern university participated in the experiment in exchange for partial course credit. Participants were randomly assigned to a one-sided frame or two-sided frame condition.

Procedure

Participants were informed they would be participating in a market research study interested in examining consumers' perceptions of new products that would soon be in their area. Participants then received the product tester reactions that consisted of a 177-word summary of the reaction of three product testers for a new brand of toothpaste. The responses were positive and consisted of statements such as "This is easily one of my favorite toothpastes I have tried," and "I was extremely impressed with its whitening power." Finally, participants' attitudes, certainty, and potential mediators were assessed.

Independent variable

Message framing. Participants who received the one-sided frame were told that all feedback was provided by product testers who had been asked to use the product for a trial period and provide their thoughts about the product. In the two-sided frame condition, participants were told that, during the trial period, participants were explicitly asked to consider any positive as well as any negative reactions they had to the product. That is, it was made clear that, in the process of using the product, product testers were encouraged to focus on both their positive and negative reactions. In both conditions participants subsequently received the same identical information from product testers. Thus, the manipulation occurred outside of the delivery of the message itself.

Dependent variables

Attitudes. Attitudes were assessed as in prior experiments ($\alpha = .92$).

Attitude certainty. Attitude certainty was measured as in prior experiments ($\alpha = .73$).

Manipulation check. To assess whether participants perceived that both sides had been carefully considered, they were asked to respond to three items. Specifically, participants were asked to report their agreement on 7-point scales (1 = Disagree strongly, 7 = Agree strongly) with the statements, "The product testers' assessment was based on a consideration of both their potential negative and potential positive reactions"; "The product testers had the opportunity to list both their positive and negative reactions"; "The product testers could have provided either positive or negative reactions to the product." These items were combined to form an aggregate measure of participants' perceptions that both sides have been considered ($\alpha = .78$).

Source bias. To assess participants' perception of the source's bias, participants were asked, "How biased do you think the product testers are," "How biased do you think the product testers were in evaluating the product." Both items were completed on 7-point scales (1 = Not at all biased, 7 = Extremely biased) and combined to form an aggregate measure of bias ($\alpha = .60$).

Source credibility. To assess source credibility, participants were asked, "How credible are the product testers," "How much expertise do the product testers have," and "How trustworthy do you think the product testers are." Items were all completed on 7-point scales (1 = not at all, 7 = extremely) and combined to form an aggregate measure ($\alpha = .90$).

Results

Manipulation check

As anticipated, two-sided framing led to greater perceptions of both sides being considered relative to the one-sided framing, $F(1, 27) = 6.05, p = .02$.

Attitudes

In line with the previous studies, participants' attitudes did not differ as a function of receiving one ($M=5.69$, $SD=1.07$) or two-sided framing ($M=5.67$, $SD=1.10$), $F<1$, *ns*.

Attitude certainty

Replicating prior experiments, there was a main effect of framing on attitude certainty such that participants reported greater certainty from the two-sided framing ($M=5.57$, $SD=1.19$) compared to the one-sided framing ($M=4.54$, $SD=1.31$), $F(1,27)=4.80$, $p=.04$.

Source bias and credibility

Message frame did not affect perceived bias of the source in the one-sided framing ($M=4.57$, $SD=1.19$) compared to the two-sided framing ($M=5.21$, $SD=1.01$), $F(1,27)=2.37$, $p=.14$. If anything, the means were in the direction opposite to a perceived bias account. Similarly, source credibility did not differ in the one-sided framing ($M=3.05$, $SD=1.20$) compared to the two-sided framing condition ($M=3.35$, $SD=1.70$, $F<1$, *ns*).

Discussion

Experiment 3 found manipulating framing outside of the content of the message had a similar effect upon certainty. This provides more direct evidence that the difference in certainty resulted from the perception both sides had been considered rather than some other aspect of framing. Furthermore, framing did not affect the credibility or bias associated with the source.

Experiment 4

Experiment 4 examined the inference we postulated to influence knowledge and thus certainty. Because two-sided framing reflects a situation where the message or sources contained within the message have apparently considered not only the positives associated with the message, but the potential negatives as well, people are less likely to think that there are negatives of which they are unaware. We hypothesized that participants' reasoning would thus be captured in differential perceptions of knowledge of negative features, but not knowledge of positive features since attention to positive information was clear in both conditions.

Our framework suggests that the changes in certainty are not stemming from differences in participants' message-relevant thoughts or recall of the message they received, but from inferences about their knowledge tied to information that was not presented (i.e., how much negative information might there be about the message topic). Nonetheless, to examine this possibility, we measured participants' actual message-relevant thoughts and recall of information as these can both serve as measures of extent of message elaboration (Petty & Cacioppo, 1986).

Finally, Experiment 4 tested two competing interpretations of our results. Specifically, one explanation for the present effects is that message framing operates as a simple cue. A second explanation is that the framing of the message affects certainty in a more thoughtful way such as by affecting inferences about missing information. To test these accounts, the present research measured

participants' natural proclivity to engage in thinking assessed via individual differences in need for cognition (NFC; Cacioppo & Petty, 1982; Cacioppo, Petty, & Kao, 1984). If framing is used as a simple cue to certainty, differences in certainty should occur primarily for those low in NFC; however, if the effects are more related to careful thinking and meta-cognition about the basis of one's attitude, the differences in certainty should occur primarily for those high in NFC (see Briñol, Petty, & Tormala, 2004; Tormala & Petty, 2004; Tormala, Petty, & Briñol, 2002).

Method

Participants and design

Forty-three undergraduates from a Midwestern university participated in the experiment in exchange for extra credit in their courses. Participants were randomly assigned to a one-sided frame or two-sided frame condition and NFC was assessed.

Procedure

Participants read about a portable DVD player called the *Praxis*. Individuals first received a screen that contained a picture of the DVD player along with a brief description of the product and a note about its features (e.g., 9" LCD screen, rechargeable battery, and stereo speakers). On subsequent screens participants received three reviews of the product that were ostensibly from students who had used the product for a month. Finally, participants completed measures to assess their attitudes, attitude certainty, perceptions of missing information, actual thoughts, message recall, and NFC.

Independent variable

Message framing. In the one-sided frame condition participants read feedback under the general heading "feedback" from three individuals who were very favorable towards the product. For example, participants read feedback from one user who said, "I really love this portable, with the jog circular pad, it makes finding any portion of the DVD movie so easy."

The remaining user feedback was also positive and commented on aspects of the product such as the size and clarity of the screen and the high quality of the battery life. In the two-sided frame condition, participants received the same positive feedback under the heading "positive feedback" but also had a heading called "negative feedback." The negative feedback consisted only of a brief comment indicating the person had no negative responses (e.g., "I have none."). Thus, the actual arguments for liking the product were held constant.

Need for cognition (NFC). Participants' NFC was assessed using the short form of the NFC scale ($\alpha=.87$; Cacioppo et al., 1984). Scores on the scale ranged from 43 to 85, with a median of 61.

Dependent variables

Attitudes. Attitudes were assessed as in prior experiments ($\alpha=.94$).

Attitude certainty. Attitude certainty consisted of the same items as in prior studies ($\alpha = .82$).

Perceptions of missing information. To assess participants' perceptions of information not presented they were asked, "How many negative features do you think there are about this DVD player that were not mentioned?" and, "How many positive features do you think there are about this DVD player that were not mentioned? Both items were assessed on 7-point scales (1 = Few negative/positive features, 7 = Many negative/positive features). As expected, these items proved to be independent ($r = -.16$, $p = .30$) and thus were analyzed separately.

Thoughts. Participants were asked to list the thoughts they had about the product (see Cacioppo & Petty, 1981 for details on the thought-listing procedure; see also Batra & Ray, 1986 and Wright, 1973 for illustrative examples). Message-relevant thoughts were coded as favorable or unfavorable by two independent coders. Interrater agreement was above 90% and disagreements were resolved by discussion. Finally, a valenced thought index was created by subtracting the number of unfavorable message-related thoughts from the number of favorable message-related thoughts and dividing this difference by the total number of message-related thoughts (see Briñol et al., 2004). Participants' thoughts were also coded for references to the source, potential missing information, the time the source spent developing arguments, the source's credibility, and general meta-cognition (e.g., "I wonder if this thought is correct?").

Recall. Participants were instructed to recall as many of the product features as they could remember. Specifically, participants were given seven boxes for listing any attributes of the product contained in the product description or mentioned by the users. Participants' total number of unique features recalled was used to index recall.

Results

Given the continuous nature of NFC, results were analyzed using regression procedures as discussed in Experiment 2.

Attitudes

There was no effect of message framing on attitudes, $\beta = .07$, $t(39) = .41$, $p = .68$, nor was there an effect of NFC on attitudes, $\beta = .11$; $t(39) = .71$, $p = .48$, or a message frame X NFC interaction, $\beta = .10$; $t(39) = .58$, $p = .57$. Participants had generally positive attitudes in both the one-sided ($M = 5.79$, $SD = .68$) and two-sided ($M = 5.92$, $SD = .93$) conditions.

Attitude certainty

Replicating our previous experiments, there was a main effect of message framing on attitude certainty, $\beta = .35$, $t(39) = 2.39$, $p = .02$, such that participants reported greater certainty when the message professed to portray both the positives and the negatives. Importantly, a reliable message frame by NFC interaction also emerged, $\beta = .30$, $t(39) = 2.06$, $p < .05$. As seen in the top panel of Fig. 2, the difference in attitude certainty was

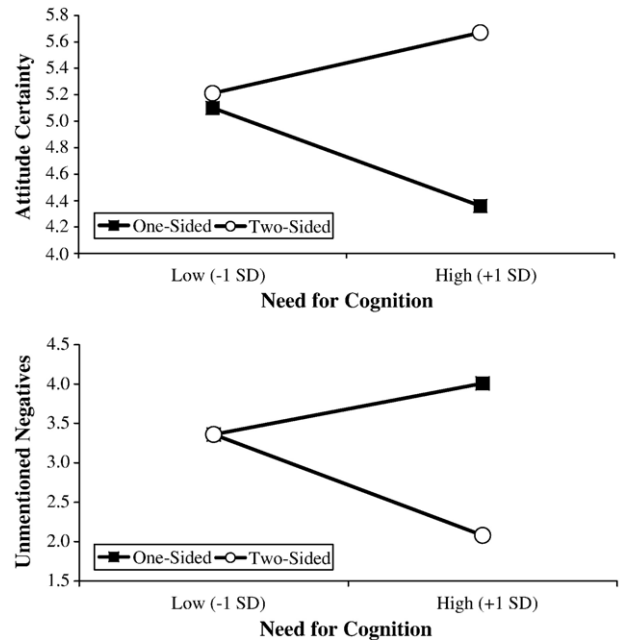


Fig. 2. Experiment 4 framing by NFC interaction on attitude certainty (Top panel) and unmentioned negatives (Bottom panel).

pronounced among those high in NFC, $t(39) = 3.20$, $p = .003$, but not those low in NFC, $t(39) = .27$, $p = .79$.

Thoughts

There were no differences in participants' message-relevant thoughts towards the product as a function of condition as assessed via the thought favorability index, $t(39) = .62$, $p = .54$. Participants had a positive thought index whether exposed to the one-sided ($M = .53$, $SD = .66$) or two-sided frame ($M = .67$, $SD = .53$), indicating generally favorable thoughts across conditions. There were also no differences in participants' total number of message-relevant thoughts, $t(39) = 1.40$, $p = .17$. Furthermore, NFC did not interact with message framing to influence the thought index or number of thoughts (p 's $> .25$). We also found no difference in participants' thoughts on any of the dimensions examined (all p 's $> .10$).

Recall

There were no differences in participants recall as a function of message framing, NFC, or a message framing X NFC interaction (p 's $> .20$).

Perceptions of missing information

When it came to participants' perceptions of the amount of missing positive information they did not receive there were no effects of message frame, NFC, or a message framing X NFC interaction (p 's $> .19$). However, when it came to participant's perception of the amount of missing negative information there was a main effect of message framing such that participants reported perceiving fewer negative pieces of missing information when they received the two-sided framed message, $\beta = -.32$, $t(39) = 2.10$, $p = .04$. There was no effect of NFC on participants' perception of missing negative information, $\beta = -.01$, $t(39) = .06$, $p = .96$.

Importantly, there was a reliable message framing by NFC interaction, $\beta = -.33$, $t(39) = 2.13$, $p = .04$. As seen in the bottom panel of Fig. 2, high NFC individuals (i.e., +1 SD on the NFC scale) perceived there to be a smaller amount of undisclosed negative information available in the two-sided compared to the one-sided condition, $t(39) = 3.06$, $p = .004$, but low NFC (i.e., -1 SD on the NFC scale) individuals reported no differences, $t(39) = .01$, $p = .99$.

Mediated moderation analysis

We examined whether the observed differences in certainty were mediated by the differences in the perceived amount of negative information missing about the product. Given the presence of moderation in the form of NFC, we conducted a mediated moderation analysis as suggested by Baron and Kenny (1986) using software provided by Preacher and Hayes (2004). We have already shown there to be a significant direct effect of the interaction (message framing \times NFC) on both the dependent measure (attitude certainty) and the proposed mediator (perceptions of missing negative information). The results of the simultaneous regression revealed that, controlling for the mediator, the effect between the independent variable (message framing \times NFC) and the dependent variable (attitude certainty) was no longer significant, $\beta = .18$, $t(38) = 1.24$, $p = .22$. However, the relationship between the mediator (undisclosed negative information) and the dependent variable was, $\beta = -.38$, $t(38) = 2.65$, $p = .01$.

Finally, to conduct a formal test of the significance of the indirect effect, the path through the mediator, we applied Bootstrap procedures suggested by Shrout and Bolger (2002) and used applications provided by Preacher and Hayes (2004). Bootstrapping computes a confidence interval around the indirect effect, and if zero falls outside of that interval the indirect effect can be said to be significant. We used a 95% confidence interval and found zero did indeed fall outside of the provided range (95% CI = .003 to .089). Thus, the mediated moderation analysis depicted in Fig. 3 was successful.

Discussion

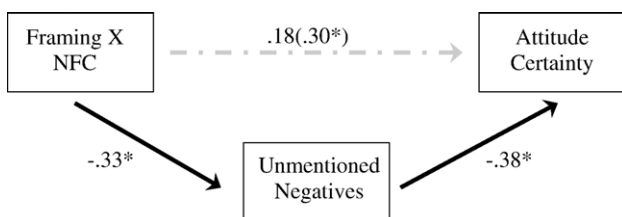
Experiment 4 provided evidence that framing had its effect by a relatively high thought process as only those high in NFC showed the effect. Experiment 4 also provided evidence of mediation in the form of participants' thoughts about undisclosed negative information. Because perceptions of missing positive information did not differ, this suggests our mediator

was uniquely sensitive to the specific inference about negative information. Also, because participants' actual thoughts did not differ as a function of message condition, differential elaboration seems an unlikely alternative explanation for our results.² It is important to note that although meta-cognition tends to operate under high thinking conditions, this does not mean that meta-cognitive factors are necessarily salient in people's thoughts or the exact meta-cognitive processes relied upon are explicitly articulated. For example, work on the ease of retrieval effect (Tormala et al., 2002) suggests that examining participants' thoughts does not reveal an explicit mention or discussion of ease or difficulty. However, the psychological process of ease can be detected by asking participants direct questions. Similarly, people's thought did not contain specific mentions about the framing of the message, or missing information, but this mechanism can be detected through direct inquiry, as done in the present experiment.

Finally, some readers might view the present findings as conflicting with those of Experiment 2. Specifically, given amount of thinking is governed by both one's *motivation* (e.g., need for cognition) and *ability* (e.g., knowledge) to think (Petty & Cacioppo, 1986), one might argue that having low knowledge could reduce one's ability to process the message and foster low elaboration conditions. Thus, at first blush, it might seem that the effects should have been observed for high knowledge individuals rather than low knowledge individuals in Experiment 2. We submit, however, that Experiment 2 used a message that we intentionally designed to be comprehensible by low knowledge participants. Indeed, the fact that all participants reported equally positive attitudes is partial evidence they were all able to process the message. Thus, given all participants were able to comprehend the message, the question is who is most in need of relying on others to ascertain the certainty with which they can place in their evaluation. According to our perspective it should be those who cannot derive knowledge from themselves (i.e., those low in knowledge). To better understand our explanation, assuming a message can be understood by all, we suspect those low in knowledge should be more likely to rely on others to ascertain their knowledge and thus their certainty; furthermore, this outcome should be more likely when those with low knowledge are motivated to process the message carefully. Future research could address this issue by examining if our effects are most likely to occur for those low in knowledge but high in NFC (or under conditions of situationally induced elaboration).

Experiment 5

One consequence of increasing attitude certainty is to increase attitude-behavior correspondence (Berger, 1992; Krishnan &



Note: Numbers in Parentheses Represent Direct Effect Before Controlling for Mediator.
* = $p < .05$

Fig. 3. Mediated moderation analysis experiment 4.

² It is worth noting that prior research suggests that low and high NFC individuals might sometimes display different thought patterns. However, in the present research participants were all told to treat the task seriously. Apparently this was sufficient to encourage equivalent processing, but not sufficient to motivate low NFC individuals to engage in the higher level of processing required for meta-cognitive activity.

Smith, 1998; Rucker & Petty, 2004). That is, if individuals hold their attitudes with greater certainty, those attitudes are more likely to guide and influence behavior. Experiment 5 was designed to demonstrate that two-sided framing can increase attitude-behavior correspondence over one-sided framing.

Importantly, in studying the influence of attitude certainty on behavior (or behavioral intentions), what is crucial is the attitude-behavior correspondence rather than mean behavior/intentions. For example, if two consumers have equally positive attitudes towards a product, but one consumer is more certain of his attitude, this more certain consumer should be more inclined to act on this attitude (i.e., make a purchase). This would lead to both greater attitude-behavior correlations and greater purchase behavior by the consumer certain of his evaluation. However, if the product is on sale, consumers who are relatively uncertain of their attitude might purchase the product as the sale serves as a catalyst for purchase. In this situation, behavior might be equivalent (i.e., purchase behavior) for those who are certain and uncertain of their attitudes, but for different reasons (i.e., reliance on one's attitude versus the promotion). In short, the more diagnostic test of the impact of attitude certainty on behavior/intentions is the strength of the correlation between attitudes and behavior rather than mean behavior/intentions.

Finally, we did not measure certainty in the present experiment. This allowed us to examine whether two-sided message framing could have consequences without making certainty salient by measuring it. If behavioral consequences depended on explicitly alerting participants' to their certainty, the practical implications of our findings would be more limited.

Method

Participants and design

Forty undergraduates at a Midwestern university participated in return for partial course credit. Participants were randomly assigned to receive a one or a two-sided message frame.

Procedure

Participants were exposed to a one or two sided- message for a pain reliever, *Kedinol-PR*. We assessed participants' behavioral intentions in addition to attitudes. Certainty was not assessed to demonstrate that two-sided framing could have consequences without explicitly forcing participants to consider their certainty.

Dependent variables

Attitudes. Attitudes were assessed using the same 3-items as in prior studies ($\alpha = .94$).

Behavioral intentions. Participants were asked what they intended to do when the product became available. Participants' were asked, "Will you purchase *Kedinol-PR*," and "Will you use *Kedinol-PR*?" Both items were completed on 7-point scales with 1 = "Definitely Will Not" and 7 = "Definitely Will." These items were combined to form a measure of behavioral intent ($\alpha = .98$). Behavioral intention items such as these are the single

best predictors of actual behavior (Fishbein & Ajzen, 1981; Sheppard, Hartwick, & Warshaw, 1988).

Results

Attitudes

Results were analyzed with ANOVA. As in prior studies, there were no differences in attitudes between one-sided ($M = 5.91$, $SD = 1.01$) and two-sided frames ($M = 6.21$, $SD = .83$; $F < 1$).

Behavioral intentions

Individuals receiving the two-sided frame reported a greater willingness to purchase the product than those receiving the one-sided frame. That is, individuals who formed favorable attitudes as a result of the two-sided frame were more likely to report intentions to behave in a favorable manner toward the product ($M = 5.60$, $SD = 1.23$) than were individuals who formed equally favorable attitudes as a result of a one-sided frame ($M = 4.63$, $SD = 1.38$; $F(1, 38) = 5.44$, $p = .03$). More importantly to the hypothesis of interest, an examination of the attitude-intention correlations revealed attitudes were more predictive of behavioral intentions following a two-sided frame ($r = .74$, $p < .01$) compared to the one-sided frame ($r = .27$, $p = .27$). Furthermore, a comparison of the correlations revealed a reliable difference in magnitude ($z = 1.98$, $p < .05$).

Discussion

Experiment 5 demonstrated that attitudes following a two-sided frame were more predictive of behavioral intentions than attitudes following a one-sided frame. In addition, individuals who received a two-sided frame were more inclined to report being likely to act in accordance with their favorable attitudes (i.e., more likely to purchase the product and stronger attitude-behavior correspondence). This provides additional support for our hypothesized effects of message framing, and suggests that even without alerting consumers to their certainty, there are indeed observable and practical consequences of this sort of message framing for persuasion.

General discussion

The current research suggests a new strategy to increase attitude certainty: framing messages as two sided. Across five experiments, explicitly highlighting that both sides of an issue were considered by others led to attitudes held with greater certainty (Experiments 1–4) and attitudes that were more likely to influence behavioral intentions (Experiment 5). Individuals apparently do not make the inference that two sides were considered in the absence of an explicit statement. In accordance with our hypothesis, these observed differences did not appear to result from any difference in consumers' actual thoughts about the product itself, but stemmed from consumers' inferences regarding possessing greater knowledge about information not directly provided (e.g., amount of negatives). Finally, moderation of these effects was observed via both category knowledge and individuals' propensity to engage in thinking (i.e., NFC).

Implications for meta-cognition in persuasion

Prior research on meta-cognitive processes in persuasion has focused on people's perceptions of their own thoughts or thought processes (Alba & Hutchinson, 2000; Briñol et al., 2004; Petty, Briñol, & Tormala, 2002; Rucker & Petty, 2004; Wright, 2002). In contrast, in the current work we show that consumers are sensitive to the type of information that has been considered by others. This extends prior work and theorizing on meta-cognition by demonstrating meta-cognitions (such as the certainty with which one holds an attitude) do not seem to stem only from a reflection of how a message is processed by oneself, but can also be invoked by information stemming from the thoughts of other people. Subsequent research could examine other types of inferences tied to how consumers believe a source arrived at a message. Such inferences might include whether a source invested a little or a lot of thinking into considering the message and whether the source is confident in the position being presented. We think this offers a novel framework for understanding source effects in consumer persuasion.

The present research might also hold implications for specific work on meta-cognition, discussed earlier, by Rucker and Petty (2004). Specifically, these researchers found individuals instructed to process a message by considering the faults of the message were more certain in their attitudes than individuals instructed to process the same message by considering the thoughts that naturally came to mind. In that research, the message contained very strong arguments so that individuals would be unsuccessful in finding fault. Unclear from that prior work is whether the increases in certainty stemmed from consumers' awareness that they had considered both sides or from the complete inability to find fault. Based on the present research, we believe it is likely the case that directing consumers to find fault increases attitude certainty, at least in part, because of the perception one has considered both sides (and thus there is little missing information). This suggests the effects observed by Rucker and Petty might be applicable in a wide variety of situations, not solely those where individuals are unable to find fault. Of course, this does not mean that the absence of negatives did not further contribute to increases in certainty in that research, only that this is unlikely to be required.

Implications for classic research on one-sided versus two-sided communications

The present research can be used as a springboard for revisiting classic research on one-sided versus two-sided communication (e.g., Kamins & Marks, 1987; Hovland et al., 1953; Lumsdaine & Janis, 1953; Sawyer, 1973). For example, when one-sided and two-sided communications yield equivalent attitude change, there might still be significant differences in the certainty of the underlying attitudes. Two-sided communications might lead people to feel their attitudes are based on more complete knowledge, and thus produce greater certainty in their attitudes. This, as in the present research, could have implications for behavior/intentions.

In fact, the present results and theorizing might well explain some classic research on two-sided communications.

Lumsdaine and Janis (1953) found that people were less likely to change their attitudes to a subsequent attack if they had initially been given a two-sided message. It seems plausible that individuals who received the initial two-sided message, even after controlling for differences in actual knowledge, may have perceived their attitudes to be based on greater knowledge since the source had given them both sides. This in turn would lead to greater attitude certainty as in the present research. Certainty could then explain the differential resistance of these attitudes to a subsequent message as certainty has been postulated to give rise to defensive processing (Gross, Holtz, & Miller, 1995) and to prevent attitude change (Tormala & Petty, 2002). This is an interesting and potentially fruitful possibility for future research.

Attitudes versus attitude certainty

The present research also speaks to the importance of recognizing the distinction between attitude certainty and attitude extremity. Collapsing across Experiments 1–4, as predicted, there was a reliable effect of message framing on attitude certainty, $F(1, 282) = 17.02, p < .001$, but no significant effect on attitudes, $F(1, 282) = 2.33, p = .13$. Furthermore, the effects of certainty remained significant even after controlling for attitudes, $F(1, 281) = 14.53, p < .001$, whereas attitudes remained non-significant, $F(1, 281) = .007, p = .93$. Several past research findings have documented the distinctiveness of the constructs (e.g., Rucker & Petty, 2004; Tormala & Petty, 2002), and earlier we reviewed reasons why this would be likely in the current work. However, future research could more fully examine whether such framing effects might sometimes affect the extremity of an evaluation. For example, perhaps if framing alerted people to negative or positive aspects of a message they normally would not have paid attention to (e.g., when elaboration is low and they are unmotivated to read information carefully), framing might influence how positive or negative participants' evaluations are. Similarly, if a message is more ambiguous, directing people's attention to negative information might influence extremity. These represent interesting directions for future research.

Practical implications

In closing, the present research offers some practical implications as well. First, in cases where a product largely has positive information associated with it and few negative pieces of information, the present research suggests it would be worth drawing consumers' attention to the fact that potential negatives were considered in developing the message. For example, advertisements employing testimonials might include clips not only of what people enjoyed about the product, but also highlight that these consumers found little they disliked as well. Second, the present research has implications for the structure of websites offering consumer feedback. Providing user feedback that clearly outlines both the positives and the negatives associated with the product might lead consumers to hold their evaluations with greater certainty, which might facilitate their decision process. Finally, even when ads foster attitudes of

equivalent valence, additional insight into the effectiveness of ads can be gauged by also including measures of attitude certainty. Ultimately, our work suggests that attitude certainty can serve as a measure of hidden effects of persuasion.

Acknowledgments


The authors would like to thank Nidhi Agrawal and Brian Sternthal as well as the members of the 2004–2005 Group for

Attitudes and Persuasion at Ohio State University and members of the 2005–2006 Kellogg on Attitudes, Motivation, and Processing group at Northwestern University for helpful comments on this research. This research was supported in part by funding from the National Institute of Mental Health individual grant no. 5F31MH12849-03, a Kraft Research Professorship, and an honorable mention award from the Society for Consumer Psychology's Sheth dissertation proposal competition, to the first author.

Appendix A

Experiment 2 Sample Messages: one-sided (top) and two-sided (bottom) message frames

Review of the Davinci



Frame: Alpha SL aluminum
Suspension: RockShox Pilot C
Wheels: Alloy F, Shimano R hub; Maverick rims
Sizes: 13, 16, 18, 19.5, 21, 22.5"
Colors: Starry Night Black/Ball Burnished, Baja Blue/Starry Night Black

Product Specifications

- Lightweight titanium frame
- The 21-gear easy-shift mechanism allows for higher elevation climbs with minimal effort.
- Comes with 2-inch studded tires for maximum traction and shock absorption
- The specially engineered handlebars are easy to adjust to proper height without tools
- Features especially designed disc brakes that allow for precise stops.
- Three year warranty

- The bike does not come with a water bottle.

Review of the Davinci



Frame: Alpha SL aluminum
Suspension: RockShox Pilot C
Wheels: Alloy F, Shimano R hub; Maverick rims
Sizes: 13, 16, 18, 19.5, 21, 22.5"
Colors: Starry Night Black/Ball Burnished, Baja Blue/Starry Night Black

Product Pros

- Lightweight titanium frame
- The 21-gear easy-shift mechanism allows for higher elevation climbs with minimal effort.
- Comes with 2-inch studded tires for maximum traction and shock absorption
- The specially engineered handlebars are easy to adjust to proper height without tools
- Features especially designed disc brakes that allow for precise stops.
- Three year warranty

Product Cons

- The bike does not come with a water bottle.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Alba, J. W., & Hutchinson, W. (2000). Knowledge calibration: What consumers know and what they think they know. *Journal of Consumer Research*, 22, 62–74.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 52, 1173–1182.
- Bassili, J. N. (1996). Meta-judgmental versus operative indexes of psychological attributes: The case of measures of attitude strength. *Journal of Personality and Social Psychology*, 71, 637–653.
- Batra, R., & Ray, M. L. (1986). Affective responses mediating acceptance of advertising. *Journal of Consumer Research*, 13, 234–249.
- Berger, I. E. (1992). The nature of attitude accessibility and attitude confidence: A triangulated experiment. *Journal of Consumer Psychology*, 1, 103–123.
- Bohner, G., Einwiller, S., Erb, H. P., & Sibler, F. (2003). When small means comfortable: Relations between product attributes in two-sided advertising. *Journal of Consumer Psychology*, 13, 454–463.
- Briñol, P., Petty, R. E., & Tormala, Z. L. (2004). Self-validation of cognitive responses to advertisements. *Journal of Consumer Research*, 30, 559–573.
- Cacioppo, J. T., & Petty, R. E. (1981). Social psychological procedures for cognitive response assessment: The thought listing technique. In T. V. Merluzzi, C. R. Glass, & M. Genest (Eds.), *Cognitive Assessment* (pp. 309–342). New York: Guilford.
- Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology*, 42, 116–131.
- Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of “need for cognition”. *Journal of Personality Assessment*, 48, 306–307.
- Fazio, R. H., & Zanna, M. P. (1978). Attitudinal qualities relating to the strength of the attitude-behavior relationship. *Journal of Experimental Social Psychology*, 14, 398–408.
- Fishbein, M., & Ajzen, I. (1981). Acceptance, yielding, and impact: Cognitive processes in persuasion. In R. E. Petty, T. M. Ostrom, & T. C. Brock (Eds.), *Cognitive responses in persuasion* (pp. 339–359). Hillsdale, NJ: Erlbaum.
- Gross, S., Holtz, R., & Miller, N. (1995). Attitude certainty. In R. E. Petty, & J. A. Krosnick (Eds.), *Attitude Strength Antecedents and Consequences* (pp. 215–245). Mahwah, NJ: Erlbaum.
- Hovland, C. L., Janis, I. L., & Kelley, H. H. (1953). *Communication and Persuasion*. New Haven, CT: Yale University Press.
- Kamins, M. A., & Marks, L. J. (1987). Advertising puffery: The impact of using two-sided claims on product attitude and purchase intention. *Journal of Advertising*, 16, 6–15.
- Krishnan, H. S., & Smith, R. E. (1998). The relative endurance of attitudes, confidence and attitude-behavior consistency: The role of information source and delay. *Journal of Consumer Psychology*, 7, 273–298.
- Krosnick, J. A., Boninger, D., Chuang, Y., Berent, M., & Carnot, C. (1993). Attitude strength: One construct or many related constructs. *Journal of Personality and Social Psychology*, 65, 1132–1151.
- Lee, A. Y. (2004). The Prevalence of Meta-Cognitive Routes to Judgment. *Journal of Consumer Psychology*, 14(4), 345–355.
- Lumsdaine, A. A., & Janis, I. L. (1953). Resistance to “counterpropaganda” produced by one-sided and two-sided “propaganda” presentations. *Public Opinion Quarterly*, 17, 311–318.
- Pechmann, C. (1992). Predicting when two-sided ads will be more effective than one-sided ads: The role of correlational and correspondent inferences. *Journal of Marketing Research*, 29, 441–453.
- Petrocelli, J. V., Tormala, Z. L., & Rucker, D. D. (2007). Unpacking attitude certainty: Attitude clarity and attitude correctness. *Journal of Personality and Social Psychology*, 92, 30–41.
- Petty, R. E., & Cacioppo, J. T. (1984). The effects of involvement on response to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality and Social Psychology*, 46, 69–81.
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In Leonard Berkowitz (Ed.), *Advances in experimental social psychology* (vol. 19, pp. 123–205). New York: Academic Press.
- Petty, R. E., Briñol, P., & Tormala, Z. L. (2002). Thought confidence as a determinant of persuasion: The self-validation hypothesis. *Journal of Personality and Social Psychology*, 82, 722–741.
- Petty, R. E., Briñol, P., Tormala, Z. L., & Wegener, D. T. (2007). The role of meta-cognition in social judgment. In E. T. Higgins, & A. W. Kruglanski (Eds.), *Social psychology: A handbook of basic principles* (2nd ed., pp. 254–284). New York: Guilford Press.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36, 717–731.
- Priester, J. R., Petty, R. E., & Park, K. (2007). Whence univalent ambivalence? From the anticipation of conflicting reactions. *Journal of Consumer Research*, 34, 11–21.
- Rucker, D. D., & Petty, R. E. (2004). When resistance is futile: Consequences of failed counterarguing for attitude certainty. *Journal of Personality and Social Psychology*, 86, 219–235.
- Sanbonmatsu, D. M., Kardes, F. R., & Herr, P. M. (1992). The role of prior knowledge and missing information in multiattribute evaluation. *Organizational Behavior and Human Decision Processes*, 51, 76–91.
- Sawyer, A. G. (1973). The effects of repetition of refutational and supportive advertising appeals. *Journal of Marketing Research*, 10, 23–33.
- Schwarz, N. (2004). Metacognitive experiences in consumer judgment and decision making. *Journal of Consumer Psychology*, 14, 332–348.
- Sheppard, B. H., Hartwick, J., & Warshaw, P. R. (1988). The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research. *Journal of Consumer Research*, 15, 325–343.
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, 7, 422–445.
- Tormala, Z. L., & Petty, R. E. (2002). What doesn’t kill me makes me stronger: The effects of resisting persuasion on attitude certainty. *Journal of Personality and Social Psychology*, 83, 1298–1313.
- Tormala, Z. L., & Petty, R. E. (2004). Source credibility and attitude certainty: A meta-cognitive analysis of resistance to persuasion. *Journal of Consumer Psychology*, 14, 426–441.
- Tormala, Z. L., Petty, R. E., & Briñol, P. (2002). Ease of retrieval effects in persuasion: A self-validation analysis. *Personality and Social Psychology Bulletin*, 28, 1700–1712.
- Wright, P. (1973). The cognitive processes mediating acceptance of advertising. *Journal of Marketing Research*, 10, 53–62.
- Wright, P. (2002). Marketplace meta-cognition and social intelligence. *Journal of Consumer Research*, 28, 677–682.