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Contextual contrast and perceived knowledge: Exploring the implications for persuasion ☆

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Abstract

The present research tested the notion that perceived target knowledge can be affected by the amount of information one has about other recently encountered stimuli—whether that information is relevant or not. Furthermore, the present research tested the implications of this effect for persuasion. In 4 experiments, participants were presented with a persuasive message promoting a fictitious department store, but first received another message containing more or less information about something else (e.g., another store, a car, or a person). Regardless of the type or valence of initial information received, the initial message had a contrast effect on perceived target knowledge, which influenced target attitudes. The less information the initial message contained, the more persuasive knowledge participants thought they received from the target message, and the more their attitudes agreed with that message. These findings suggest that the perceived amount of persuasive information one has about a target stimulus can be manipulated to increase persuasion, even when the actual amount of information about the target stimulus does not vary.

Keywords: Attitudes; Persuasion; Knowledge; Contrast

Persuasion researchers have long been interested in the effect of amount of persuasive information on attitude change. It is now well-established that the more persuasive information a message contains (up to some reasonable limit), the more persuaded people tend to be (e.g. Calder, 1978; Calder, Insko, & Yandell, 1974; Chaiken, 1980; Maddux & Rogers, 1980; Norman, 1976). In fact, when people are not thinking very carefully, even providing large amounts of *specious* information can enhance persuasion (Petty & Cacioppo, 1984). Thus, this numerosity effect, whereby presenting more persuasive information leads to more persuasion, is quite pervasive (see also Pelham, Sumarta, & Myaskovsky, 1994). Despite the widespread interest in these effects, almost nothing is known the role of the *perceived* amount of information, or perceived knowledge, in this domain. The current research examines whether simply thinking one has received more persuasive information from a message can influence persuasion even when the actual amount of information received is held constant.

Although we could identify no prior studies measuring perceived knowledge obtained from persuasive messages, considerable research suggests that general perceptions of knowledge do play an important role in information processing. For instance, the greater one's "feeling of knowing" of an elusive item in memory, the more time one will spend searching for that item before giving up (e.g. Costermans, Lories, & Ansay, 1992; Johnson, 1994; Koriat & Goldsmith, 1996; Nelson & Narens, 1990; cf. Radecki & Jaccard, 1995). Perceived knowledge has also been found to have implications for behavior. For exam-

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ple, attitudes tend to be more predictive of behavior when they are associated with high rather than low levels of perceived knowledge on a topic (Davidson, Yantis, Norwood, & Montano, 1985).

In the current research, we examine whether perceived knowledge—defined as the amount of persuasive information in a particular direction one believes one has about a target stimulus—can determine the impact of a persuasive message. Before turning to our specific hypotheses, it is useful to consider the question of where perceived knowledge comes from. Surprisingly, very little is known about the origin of these perceptions. What we do know is that perceived knowledge is not entirely derived from the actual amount of information one possesses. Indeed, measures of perceived and actual knowledge tend to manifest very low correlations (e.g. Glenberg, Wilkinson, & Epstein, 1982; Krosnick, Boninger, Chuang, Berent, & Carnot, 1993; Radecki & Jaccard, 1995).

In the present research, we propose that the perceived knowledge one has about a target stimulus might be influenced, at least in part, by the amount of information one has about other recently encountered stimuli. For example, one may conclude that one knows a lot about sports, not because the amount of sports trivia one can recall is high in some absolute sense, but because one was just asked about art, about which one knows very little. Similarly, one might perceive that a persuasive message conveys a great deal of knowledge, not because the amount of information it contains is high in an absolute sense, but because one just received a persuasive message about something else with very little information. If perceived knowledge can be influenced in this manner, this would suggest that the persuasive context (in terms of prior persuasive messages) has great power to determine the impact of a given message or advocacy.

The context of persuasion

In general, context effects can be assimilative or contrastive in nature. Assimilation occurs when a person's judgment of a target stimulus (e.g., an attitude object) shifts toward the context (e.g., one's judgment of an earlier stimulus). Contrast occurs when a person's judgment of a target stimulus shifts *away* from the context. For instance, one might judge a target person as more (assimilation) or less (contrast) hostile after initial exposure to a hostile individual (Herr, 1986; Moskowitz & Skurnik, 1999). Over the years, researchers have made considerable headway in identifying moderators of assimilation versus contrast. For example, contrast is more likely than assimilation to occur when the standard of comparison (i.e., the context) is extreme (e.g. Herr, 1986; Sherif & Hovland, 1961), when the standard of comparison is an exemplar (e.g., Einstein) rather than a category (e.g., professor; Dijksterhuis et al., 1998), when the target stimulus is unambiguous rather than ambiguous (e.g. Herr, Sherman, & Fazio, 1983), when people have an initial perception that the context and target stimuli are different rather than similar (e.g. Brown, Novick, Lord, & Richards, 1992; Mussweiler & Bodenhausen, 2002), and when an assimilative effect of the context is expected and people overcorrect their judgments to remove the unwanted bias (e.g. Martin, Seta, & Crelia, 1990; Petty & Wegener, 1993).

Despite the theoretical and empirical scrutiny given to context effects over the years, they have received little attention in the persuasion literature (see Ostrom & Upshaw, 1968, for an exception). This is surprising given that persuasion rarely, if ever, occurs in isolation. On the contrary, people are typically exposed to attitude objects and persuasive messages in the context of other objects and other persuasive messages. When people are reading the newspaper, surfing the internet, or watching television, for instance, they are exposed to seemingly endless streams of persuasive messages. In less commercial settings as well (e.g., presidential debates), persuasive messages are often delivered in the context of other messages. Thus, understanding the impact of prior persuasive messages on subsequent persuasive messages is an important undertaking.

In the present research, we attempt to address this issue by exploring the effect of persuasive context on: (1) perceptions of knowledge received from target messages and (2) the resultant persuasiveness of those messages. Although we assume both contrast and assimilation effects are possible in this domain, we restricted our focus to contrast in our initial exploration. The rationale for doing so was that we assumed contrast would be more likely than assimilation to operate in the common situation in which people are exposed to multiple persuasive messages about different things. In these scenarios, people typically receive messages about very specific attitude objects (i.e., exemplars) that have little, if anything, to do with one another (e.g., a particular brand of computer, a new soft drink, a politician). As reviewed already, these are precisely the conditions under which contrast effects have proven most likely to emerge.[1]

Prior evidence

Although perceived knowledge was not assessed in this research, there is some evidence from the consumer domain that the amount of information in prior messages can have a contrastive influence on people's willingness to rely on subsequent messages. Sanbonmatsu, Kardes, Posovac, and Houghton (1997) presented participants with a small amount of persuasive information about one object immediately after receiving a larger amount of information about another object. Sanbonmatsu et al. found that attitudes toward the second object were "moderated" (i.e., became less favorable) when descriptions of that object followed descriptions of other objects with more information. They concluded that contextual information highlighted

[1] We do think it is interesting to consider the possibility that assimilation effects might also play a role in some multiple message persuasion situations, and we return to this idea in the *General discussion*.

the evidentiary limitations of the focal information and, thus, reduced its impact. In essence, prior persuasive statements could reduce the efficacy of subsequent persuasive messages by making them appear inadequate.

Sanbonmatsu et al.'s (1997) finding is clearly consistent with the current predictions, but there are some important differences between that research and our approach. Most importantly, we examine a broader impact of prior messages. We argue that prior messages need not be limited in scope to *reducing* the weight (and subsequent persuasiveness) of target messages. On the contrary, when a prior message contains less information than a target message (a condition not considered in the Sanbonmatsu et al. studies), we expect the persuasive impact of the target message to be augmented. Moreover, we focus on, and seek to provide evidence for, the mediational role of perceived knowledge in producing this effect.

The current research

In this research we explored the possibility that target messages might be more (less) persuasive to the extent that they are preceded by other messages containing less (more) information. Furthermore, we assessed the independence of this effect from the actual amount of information target messages contain. In four experiments, we presented participants with a persuasive message about a fictitious department store. Immediately before reading this message, participants received another message about something else containing either more or less information. Across experiments, we varied the content of the initial message, such that it contained information about another department store, an automobile, or a person. We also varied the valence of information presented across conditions. We predicted that regardless of the type or valence of *initial* information presented, participants would be more persuaded by the target message (i.e., have more favorable attitudes if the message was favorable and more unfavorable attitudes if the message was unfavorable) after first receiving a low rather than high amount of persuasive information about something else. We expected this effect to be mediated by perceived knowledge with respect to the target stimulus.

Experiment 1

In the first experiment, we sought to provide an initial test of perceived knowledge contrast. We had two main predictions. First, we predicted that participants would be more persuaded by a target message when they first received another message containing less rather than more information. Second, we predicted that this effect would be mediated by perceptions of how much knowledge or information one received from the target message. We also expected these effects to be independent of both the actual amount of information participants had about the target stimulus and the extent to which participants processed, or elaborated upon, the target message. This final issue was important as it could be that exposure to differing amounts of prior information affects people's ability to process, attend to, or engage the target message. For example, an initial message with much information might tax individuals and restrict their ability to elaborate upon the target message. Assuming a strong target message, reduced cognitive capacity could hinder persuasion (see Petty, Wells, & Brock, 1976). Thus, ruling out processing differences was an important secondary goal of this initial experiment.

Method

Participants and procedure

Forty-four undergraduate students at Ohio State University participated in the experiment in partial fulfillment of a course requirement. When participants arrived, they were greeted by an experimenter, and seated in one of eight partitioned personal computer stations. All sessions were conducted on computers using MediaLab Research Software (Jarvis, 2002). At the outset of the experiment, participants were led to believe they were taking part in a study on "consumer memory," and that researchers had recently discovered that "memory for this type of information is fundamentally different from memory for other kinds of information." Participants were told that to examine consumer memory, we would present them with information about two department stores, which we wanted them to study for a memory test later in the experiment.

Following these opening instructions, participants were presented with persuasive messages promoting two fictitious department stores—Smith's and Brown's (modeled after materials used by Sanbonmatsu & Fazio, 1990). For all participants, Smith's Department Store was the first (prior) stimulus and Brown's Department Store was the second (target) stimulus. The information about Smith's and Brown's was presented sequentially on a series of screens. After reading through both messages at their own pace, participants were told that to give the information a chance to "settle in" before testing their memory, we had a series of questions for them to answer. These instructions were followed by measures of perceived knowledge about Brown's and attitudes toward Brown's. After these measures, participants engaged in thought listing and free recall tasks. Finally, participants were thanked for their time, and debriefed.

Manipulation of prior information

As described above, the target stimulus was *Brown's Department Store*. Participants received information about Brown's in the form of a persuasive message. All of the information in this message was positive toward the store. The message began with introductory information about Brown's, including that it had the following departments: home maintenance, household appliances, automotive, music, apparel, landscaping and lawn care, cosmetics, and jewelry. Following this overview, participants received

more detailed information about three Brown's departments—home maintenance, music, and apparel. Thus, three out of eight departments were described. This information was presented over two computer screens. As an example, the description of Brown's home maintenance department was as follows:

> Brown's home maintenance department places a high priority on product quality. The department manager requires all departmental employees to stay up to date on the latest technological developments in the area, and quizzes them semi-annually to ensure their knowledge. Staff in the home maintenance department are also encouraged to read home maintenance journals and visit web sites containing information on new products and equipment. The home maintenance department guarantees its products, and offers free repair or replacement of any purchase for up to 30 days. In addition, the home maintenance department provides competitively priced repair services on products purchased at Brown's or any other store.

Prior to the information about Brown's, participants received either a high or low amount of information about *Smith's Department Store*. This information was also presented in the form of a persuasive message, and generally looked very similar to the Brown's message. In both the high and low prior information conditions, participants learned that Smith's had the following departments: household items, kitchenware, camera, automotive, clothing, gardening, sporting goods, and cosmetics. In the *high prior information* condition, participants then received more detailed information about six Smith's departments—camera, automotive, sporting goods, cosmetics, gardening, and kitchenware. Thus, six out of eight departments were described in this condition. This information was presented over a series of three computer screens. In the *low prior information* condition, however, participants received detailed information about just one Smith's department—the camera department. This information was presented on one screen. Of importance, each of the descriptions of each department in each store was pretested to be comparably positive to the others and equivalent in strength when examined in isolation.

Dependent measures

Perceived knowledge. Immediately following the messages, we assessed perceived knowledge. Three items, adapted from previous research (Davidson et al., 1985; Radecki & Jaccard, 1995; Visser & Krosnick, 1998), were used: How much information do you feel you have about Brown's Department Store? How knowledgeable do you feel you are about Brown's Department Store? To what extent do you feel you have enough information to make a sound decision about Brown's Department Store? Participants responded to these items on scales ranging from 1 to 9, anchored at *none at all–very much*, *not knowledgeable at all–extremely knowledgeable*, and *not at all–very much*, respectively. Responses displayed high internal consistency ($\alpha = .94$), so we averaged them to form a composite index of perceived knowledge.

Attitudes. Following the perceived knowledge measure, several items assessed attitudes toward Brown's. Participants were asked to rate Brown's on four scales ranging from 1 to 9, with the following anchors: *dislike very much–like very much*, *very negative–very positive*, *very bad–very good*, *very unfavorable–very favorable*. Each scale was preceded by a question, such as, "To what extent do you like or dislike Brown's Department Store?" or, "How good or bad would you say Brown's Department Store is?" Responses to these items had high internal consistency ($\alpha = .89$), so they were averaged to form a global attitude index.

Thought favorability. Immediately following the attitude items, participants were instructed to list the thoughts they had as they were reading the message about Brown's (see Cacioppo & Petty, 1981). Individual thoughts were entered into a series of boxes that appeared on the computer screen one at a time. Participants were told to list as many thoughts as they had, but to enter only one per box, and not to worry about spelling or grammar. At the end of the experiment, participants were presented with each of their thoughts and classified each one as positive, negative, or neutral with respect to Brown's or the Brown's message. As an index of amount of thinking for each participant, we simply counted the number of thoughts listed. As an index of thought favorability, we subtracted the number of unfavorable thoughts from the number of favorable thoughts and divided the difference by the total number of thoughts listed. Only 8% of all thoughts listed were neutral, so these were excluded from the favorability index.

Actual knowledge. After the thought listing procedure, we assessed participants' actual knowledge of Brown's using a free recall task (see Kallgren & Wood, 1986). We asked participants to list everything they could remember about Brown's in a series of boxes on the computer screen. Participants were instructed to enter only one item (i.e., one thing they could remember) in each box. Participants were encouraged to recall as much as they could, but were given no specific number of items to list, and were not constrained by time in any way during this task. Only accurate recall was included in the actual knowledge measure. Accuracy was determined using a loose gist criterion, meaning that if an item listed roughly captured the gist of one of the points from the Brown's message, it was coded as accurate.

Self-reported elaboration. At the end of the experiment, we assessed perceived elaboration. Participants were asked to think back to the information they had received about Brown's and report the extent to which they had thought deeply about it. Responses were provided on a scale ranging from 1 to 9, anchored at *not at all* and *very much.*

Results

Perceived knowledge and attitudes

We began by submitting the perceived knowledge and attitude data to analysis. As predicted, amount of prior information had a significant effect on perceived target knowledge, $t(42) = 3.46$, $p = .001$, such that participants thought they had more knowledge about Brown's when they first received less ($M = 5.62$, $SD = 1.12$) rather than more ($M = 4.23$, $SD = 1.52$) information about Smith's. The attitude data also revealed an effect of the prior information manipulation. Attitudes toward Brown's were more favorable in the low ($M = 6.66$, $SD = .84$) rather than high ($M = 5.47$, $SD = 1.46$) prior information condition, $t(42) = 3.32$, $p = .002$.

Mediation. To provide direct evidence that the attitude effect was mediated by perceived knowledge, we conducted a mediational analysis using the technique recommended by Baron and Kenny (1986). This analysis revealed the predicted outcome. There was a significant effect of prior information (dummy coded: 0 = low, 1 = high) on both perceived knowledge, $\beta = -.47$, $t(42) = -3.46$, $p < .002$, and attitudes, $\beta = -.46$, $t(42) = -3.32$, $p < .002$. In addition, perceived knowledge predicted attitudes, $\beta = .77$, $t(42) = 7.91$, $p < .001$. When amount of prior information and perceived knowledge were both included in a regression model predicting attitudes, however, the effect of perceived knowledge remained significant, $\beta = .72$, $t(41) = 6.49$, $p < .001$, but the direct effect of the prior information manipulation did not, $\beta = -.12$, $t(41) = -1.06$, $p > .29$. A Sobel test indicated a significant mediational pathway ($z = 3.03$, $p < .01$).

Actual knowledge

We next analyzed the actual knowledge data. To begin with, there was an unexpected marginal effect for the amount of prior information manipulation, $t(42) = 2.92$, $p < .06$. Participants tended to recall more information about Brown's after first receiving a low ($M = 5.95$, $SD = 3.37$) rather than high ($M = 4.14$, $SD = 2.61$) amount of information about Smith's. Not surprisingly, then, we also found that actual knowledge and perceived knowledge were significantly and positively correlated ($r = .36$, $p < .02$). However, actual knowledge was incapable of accounting for the perceived knowledge or attitude effect. When both amount of prior information and actual knowledge were placed in a regression model predicting perceived knowledge, for example, only the effect of manipulated prior information remained significant, $\beta = -.40$, $t(41) = -2.88$, $p < .007$. The effect of actual knowledge was reduced, $\beta = .24$, $t(41) = 1.70$, $p < .10$. Furthermore, although actual knowledge was positively correlated with attitudes ($r = .33$, $p < .03$), when both actual and perceived knowledge were placed in a regression model predicting attitudes, the relationship between actual knowledge and attitudes disappeared, $\beta = .06$, $t(41) = .61$, $p > .54$. Perceived knowledge, on the other hand, remained a strong predictor in this analysis, $\beta = .75$, $t(41) = 7.12$, $p < .001$.

Elaboration

It was also important to address the possibility that elaboration of the target message differed across conditions. We approached this issue from multiple angles. To begin with, we submitted the self-reported elaboration index to analysis. Although this measure has proven sensitive to differences in elaboration in prior research (see Wegener, Downing, Krosnick, & Petty, 1995), we found no differences across the low ($M = 5.32$, $SD = 1.59$) and high ($M = 4.91$, $SD = 1.74$) prior information conditions, $t(42) = .81$, $p > .42$.[2] We also analyzed the number of thoughts generated. Although this too has proven sensitive in prior research (Wegener et al., 1995), participants generated approximately the same number of thoughts in the low ($M = 3.50$, $SD = 1.87$) and high ($M = 2.86$, $SD = 1.73$) prior information conditions, $t(42) = 1.17$, $p > .24$. Finally, and of greatest importance, there were no differences in the ability of thoughts to predict attitudes across conditions. This is notable because attitude–thought correspondence is a well-established index of elaboration (see Petty & Cacioppo, 1986). Attitudes and thought favorability were significantly correlated overall ($r = .54$, $p < .001$), and were significantly correlated within the low ($r = .47$, $p < .03$) and high ($r = .51$, $p < .02$) prior information conditions. In short, none of the measures of elaboration differed between conditions. Thus, differential elaboration could not account for the effect of perceived knowledge on attitudes.

Discussion

As predicted, participants reported greater perceived knowledge when they received little rather than much prior information, and this effect had implications for persuasion. The more persuasive information people thought they had about Brown's, the more they liked Brown's. It is important to reiterate that everyone received the exact same information about Brown's, and although there were marginal differences in actual knowledge (i.e., recall) across conditions, they could not account for the perceived knowledge or attitude effect. Furthermore, the elaboration data suggested that the effects could not be explained by differences in processing of the target message. Particularly telling in this regard were the thought favorability analyses. The thought index was sensitive (i.e., it correlated with attitudes), but it did not reflect any differences in elaboration across conditions. Thus, the perceived knowledge and attitude effects did not depend on the extent to which participants processed, attended to, or remembered the information in the target message.

Experiment 2

Our interpretation of the findings from Experiment 1 is that prior persuasive messages, even when irrelevant, can

[2] We also included measures of self-reported elaboration in Experiments 2–4. There were never any effects on perceived elaboration that even approached significance, all Fs < 1. Thus, we do not present these data or discuss them further.

influence perceptions of the information received from subsequent messages. However, it is not entirely clear that the prior information in Experiment 1 was considered irrelevant. Given that both messages were about department stores, the Smith's message might have been perceived as quite relevant to the Brown's message. If true, it could be argued that the present effects are rather limited in scope, occurring only when the stimuli in question are both exemplars of the same category or otherwise relevant to understanding each other.

But what if the prior stimulus had been something other than a store? For example, what if the prior stimulus were a car? If the perceived knowledge contrast effect requires the subjective assessment that the first stimulus is relevant to the second, information about a car presumably would have no impact on judgments of a store. If, on the other hand, the contrast effect on perceived knowledge is more general in nature, information about a car might impact judgments of a store. In Experiment 2, we explored this issue by varying the prior stimulus. In addition to expanding our understanding of the effect in question, this study had practical import. In real life persuasion situations, people do not always receive consecutive persuasive messages about two different items from the same category (although sometimes this may be the case). It is much more common to receive consecutive messages about unrelated items. Thus, Experiment 2 extended the findings by assessing the generality of the contrast effect.

In Experiment 2, we also reversed the order of the perceived knowledge and attitude measures. In Experiment 1, perceived knowledge was measured before attitudes. In naturally occurring persuasion situations, people are rarely asked to report perceived knowledge after receiving persuasive messages. Furthermore, it is possible that when people are asked about their perceptions of how much knowledge they have about a target stimulus, this could create consistency or demand pressures with respect to their attitudes toward that stimulus. To address these issues in Experiment 2, we assessed attitudes before perceived knowledge.

Method

Participants and design

Eighty undergraduate students at Ohio State University participated in partial fulfillment of a course requirement. Participants were randomly assigned to conditions in a 2 (amount of prior information: low or high) $\times$ 2 (type of prior information: store or car) between participants factorial design.

Procedure

The basic procedure for this experiment was almost identical to that of Experiment 1. The primary exception was that instead of informing participants that they would be exposed to information about department stores, we told them they would be receiving information about 2 "consumer items." This change was made to accommodate our manipulation of type of prior information. All the information about both objects was positive.

Independent variables

Type of prior information. Prior to receiving the persuasive message about Brown's, participants received an initial persuasive message that was designed to vary in its perceived relevance to Brown's. In the *store condition*, participants received an initial message about Smith's Department Store. In this condition, participants received the exact same information about Smith's that they received in Experiment 1. In the *car condition*, participants received an initial message about a car—specifically the Mini Cooper.[3] In this condition, participants received some basic introductory information about the Mini, followed by a persuasive message that was similar in appearance and format to the messages presented about Brown's and Smith's.

Amount of prior information. Participants received a high or low amount of information about the prior stimulus. When the prior stimulus was Smith's, this manipulation was identical to Experiment 1. When the prior stimulus was the car, the manipulation was very similar. In the *high prior information* condition, participants received detailed information about six aspects of the Mini—exterior design, interior space and configuration, engine and performance, safety, economic utility, and dealer customer service—presented over a series of three computer screens. In the *low prior information* condition, participants were presented with detailed information about just one aspect of the Mini—its interior space and configuration—which was all presented on one screen. Each of the descriptions of each feature of the car was established in pretesting to be comparably positive to the others and equivalent in strength when examined in isolation.

Dependent measures. Immediately following the information about Brown's, we assessed *attitudes* toward Brown's using the same 4 items as in Experiment 1 ($\alpha = .93$). Following the attitude items, we measured *perceived knowledge* with respect to Brown's using the same items as before ($\alpha = .85$), and then assessed participants' *actual knowledge* of Brown's using the same free recall task.

Results

Perceived knowledge and attitudes

We began by submitting the perceived knowledge data to a 2×2 ANOVA, with amount and type of prior information as the independent variables. As illustrated in Table 1, there was no effect of type of prior information on perceived knowledge of Brown's, $F(1, 76) = .25$, $p = .62$. However, we did find the expected main effect of amount of

[3] This experiment was conducted shortly before the Mini Cooper had been re-released in the United States. Thus, participants' prior knowledge about the stimulus presumably was low.

Table 1
Experiment 2: Attitudes and perceived knowledge as a function of amount and type of prior information

Measure	Amount of prior information							
	Prior stimulus: store				Prior stimulus: automobile			
	Low		High		Low		High	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Attitudes	6.73	1.34	5.90	1.36	6.89	1.21	6.34	.93
Perceived knowledge	5.62	1.24	4.90	1.00	5.92	1.24	4.88	1.40

prior information, $F(1, 76) = 10.26$, $p < .002$. Participants felt more knowledgeable about Brown's when they first received a small ($M = 5.77$, $SD = 1.23$) rather than large ($M = 4.89$, $SD = 1.19$) amount of information about another stimulus. There was no amount × type interaction, $F(1, 76) = .36$, $p > .55$.

Next, we submitted the attitude data to the same 2 × 2 ANOVA. As illustrated in Table 1, type of prior information had no effect on target attitudes, $F(1, 76) = 1.19$, $p > .27$. There was, however, a significant main effect of amount of prior information, $F(1, 76) = 6.18$, $p < .02$. Attitudes were more favorable after participants first received a small ($M = 6.81$, $SD = 1.26$) rather than large ($M = 6.11$, $SD = 1.18$) amount of information about another stimulus. The interaction did not approach significance, $F(1, 76) = .25$, $p > .61$.

Mediation. As in Experiment 1, we conducted a mediational analysis of the attitude effect using the Baron and Kenny (1986) technique. There was a significant effect of amount of prior information (dummy coded: 0 = low, 1 = high) on both perceived knowledge, $\beta = -.34$, $t(78) = -3.23$, $p < .002$, and attitudes, $\beta = -.28$, $t(78) = -2.54$, $p < .02$. In addition, perceived knowledge predicted attitudes, $\beta = .57$, $t(78) = 6.09$, $p < .001$. When amount of prior information and perceived knowledge were both included in a regression model predicting attitudes, the effect of perceived knowledge remained significant, $\beta = .54$, $t(77) = 5.40$, $p < .001$, but the direct effect of amount of prior information did not, $\beta = -.09$, $t(77) = -.92$, $p > .35$. A Sobel test indicated that the mediational pathway was significant ($z = 2.74$, $p < .01$).

Actual knowledge

A 2 × 2 ANOVA on actual knowledge (free recall) failed to reveal any significant effects, Fs < 1. Furthermore, the relationship between actual and perceived knowledge of Brown's did not reach significance ($r = .17$, $p > .14$), and when both the amount of prior information (dummy coded) and actual knowledge were placed in a regression model predicting perceived knowledge, the effect of manipulated prior information was significant, $\beta = -.33$, $t(77) = -2.88$, $p < .004$, whereas the effect of actual knowledge was not, $\beta = .13$, $t(77) = 1.26$, $p > .21$. There was also no relationship between actual knowledge and attitudes ($r = .17$, $p > .14$).

Discussion

Replicating the first experiment, Experiment 2 revealed a contrast effect of prior information on target attitudes that was mediated by perceived knowledge. When participants first received a small amount of information about another stimulus, they perceived that they had more knowledge about Brown's, and they became more favorable toward Brown's. This effect was independent of actual knowledge. All participants received the same target information, and there were no differences in recall of this information. These results extend the findings of Experiment 1 in two important ways. First, participants completed the attitude items before the perceived knowledge items. As a consequence, consistency or demand pressures related to the perceived knowledge index cannot explain the attitude effect. Second, the contrast effect did not depend on the type of initial information received. Whether participants first learned about another store or a car, they contrasted their perceptions of how much knowledge they had about the target stimulus away from their perceptions of how much knowledge they had about the initial stimulus. Even when two stimuli have no logical relation, then, perceived knowledge of one can be contrasted from perceived knowledge of the other and, thus, have implications for persuasion.

Experiment 3

Experiment 3 had two primary objectives. First, we expanded our test of the generality of the effects. In this experiment, which again used Brown's as the target stimulus, participants were randomly assigned to receive a high or low amount of initial information about a person. Although the car condition in Experiment 2 used a stimulus that was clearly less relevant to Brown's than was Smith's, it could be that it was still relevant to understanding the store as both cars and stores are consumer items, which gives them some broad categorical connection.

The second objective of Experiment 3 was to better understand the mechanism behind the effect of perceived knowledge on attitudes. We propose that the effect involves a metacognitive assessment of how much knowledge in a given direction one has received from a target message. Greater perceived favorable knowledge suggests that more favorable attitudes are warranted. However, it could also be that as perceived knowledge increases, the feeling of

familiarity increases, which in turn makes attitudes more favorable. Indeed, there is a well-established link between perceived familiarity and positive evaluations (e.g. Jacoby & Kelley, 1990; Moreland & Zajonc, 1982; see also Monin, 2003). There is at least one notable difference between these explanations. Specifically, they make divergent predictions with respect to negative information. According to the former notion, increasing perceived knowledge should make attitudes more favorable when the information in a target message is positive, but less favorable when the information in a target message is negative. According to the latter notion, however, the valence of the target information should not matter. Whether the information is positive or negative, perceiving more of it should enhance attitude favorability, because the mere feeling of familiarity produces positivity. We examined this issue in Experiment 3 by manipulating information valence.

Method

Participants and design

Sixty-four undergraduate students at Ohio State University participated in partial fulfillment of a course requirement. They were randomly assigned to conditions in a 2 (amount of prior information: high or low) × 2 (valence of information: positive or negative) between participants factorial design.

Procedure

Overall, the procedure for Experiment 3 closely paralleled that of the first two experiments. At the outset, participants were led to believe they were taking part in a memory study, and that we were interested in whether consumer memory differed from person memory, or memory for individual persons or groups of people. Participants were then presented with initial information about a person, followed by the target information about Brown's Department Store. Finally, participants reported attitudes, after which they were thanked and debriefed.

Independent variables

Amount of prior information. All participants received an initial message about a fictitious person named David. The message began with a brief overview of his life. In the *high prior information* condition, participants then received further information about David's childhood, pre-college educational experiences, university experiences, hobbies, personal relationships, and career developments. This information appeared in several paragraphs over a series of three screens. In the *low prior information* condition, participants only received further information about David's pre-college educational experiences. This information appeared on a single screen. As in the first 2 experiments, we pretested the materials to make sure the information in the low prior information condition was rated as positively or negatively as the information in the high prior information condition, depending on condition.

Valence of information. Participants were also randomly assigned to the positive or negative information conditions. In the *positive* condition, participants received the same information about Brown's as in Experiments 1 and 2, after first receiving positive information about the person (e.g., he excelled in school). In the *negative* condition, participants received information about the same three departments in Brown's, but it was changed to be unfavorable. For example, participants received the following information about the home maintenance department:

> Brown's home maintenance department does not place a high priority on product quality. The department manager does not require departmental employees to stay up to date on the latest technological developments in the area, and does not hold them responsible for their knowledge of home maintenance products. Also, staff in the home maintenance department are encouraged to steer customers toward the more expensive products and equipment in the store. This ensures that the store makes more money, but does not usually lead to customers getting the best deals. The home maintenance department does not guarantee its products, or offer replacement of any purchases. In addition, the home maintenance department provides very high-priced repair services on products purchased at Brown's, but no service at all for products purchased at other stores.

Before receiving the information about Brown's, participants in the negative condition first received negative information about the person (e.g., he did not do well academically). Within condition, descriptions of the prior and target stimuli were always of the same valence.

Attitude measure

Having shown in the first two studies that perceived knowledge mediates the attitude effect regardless of whether it precedes or follows the attitude items, we dropped the perceived knowledge measure from this experiment. Attitudes toward Brown's were assessed using the same items as before ($\alpha = .92$).

Results

The attitude data were submitted to a 2 × 2 ANOVA with amount of prior information and valence of information as the independent variables. This analysis revealed the expected main effect for information valence, $F(1, 60) = 202.96$, $p < .001$. Attitudes toward Brown's were more favorable in the positive condition ($M = 6.44$, $SD = 1.40$) than in the negative condition ($M = 2.35$, $SD = 1.18$). There was no main effect for amount of prior information in this experiment, $F(1, 60) = 1.21$, $p > .27$, which we expected given that information was provided in different directions across conditions. Most important, there was a significant interaction between valence and amount of prior information, $F(1, 60) = 20.67$, $p < .001$. As illustrated in Fig. 1, when positive information was presented, we replicated our earlier

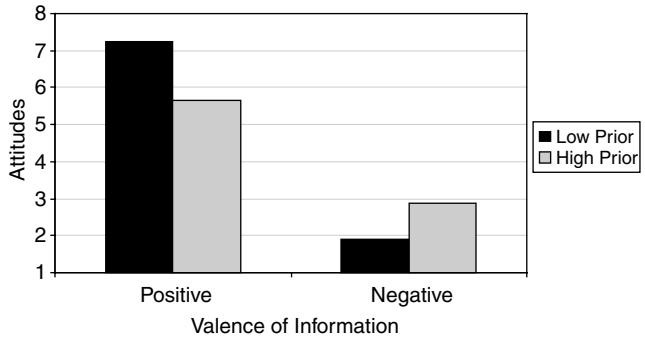

Fig. 1. Target attitudes in Experiment 3 as a function of amount and valence (direction) of prior information.

effects—that is, attitudes were more favorable in the low ($M = 7.25$) relative to high ($M = 5.64$) prior information condition, $F(1, 60) = 18.29$, $p < .001$. When negative information was presented, this effect was significantly reversed—that is, attitudes were *less* favorable in the low ($M = 1.89$) relative to high ($M = 2.87$) prior information condition, $F(1, 60) = 5.26$, $p < .03$.

Discussion

Experiment 3 had two major findings. To begin with, even prior information about a person affected attitudes toward a store. This finding suggests that the perceived knowledge contrast effect does not require the prior and target stimuli to be related in any logical way. Furthermore, we found an interaction between valence and amount of prior information. That the attitude effect was reversed under negative information conditions suggests the effect is not a function of perceived familiarity. On the contrary, when the information was negative, increasing perceived knowledge (which we can safely assume was affected given the results of the first 2 studies) produced more *negative* attitudes. It appears that participants relied not on perceived familiarity, but on a straightforward inference about the amount and direction of knowledge they had about the target stimulus based on their experience with an earlier unrelated stimulus.

Experiment 4

To this point, the findings suggest that prior messages can affect people's perceptions of how much persuasive information they have about a stimulus. These perceptions, in turn, have implications for persuasion. In Experiment 4 we sought to further explore the mechanism by examining an additional alternative explanation. Specifically, we assessed the role of *evaluative* contrast. It is possible that when participants receive a high amount of favorable information about an initial stimulus, they like that stimulus more and, thus, like the target stimulus less by comparison. If true, target attitudes could be influenced without any change in perceived target knowledge. We have provided mediational evidence for the role of perceived knowledge, but it is still possible that evaluative contrast was operating at some level. In Experiment 4, we examined this issue by varying the amount of *negative* information provided about an initial stimulus, and following it with *positive* information about a target stimulus. According to the perceived knowledge mechanism, if the target message is positive, people should still like the target stimulus more when it was preceded by a low rather than a high amount of negative information, because the key is how much information is perceived as coming from the target message. According to the evaluative contrast mechanism, however, the opposite effect should occur. A lot of initial negative information, for example, would make the initial stimulus more negative, which would then make the target stimulus more positive.

In Experiment 4, we also sought to gain further insight into the nature of the perceived knowledge effects by asking participants to estimate the number of positive and negative features the target stimulus had. According to some past research on numerosity effects (e.g. Petty & Cacioppo, 1984), people have been thought to essentially count the number of arguments in a message, such that more arguments would yield more persuasion. Past research has not explicitly argued that it is the precise number of arguments that matters (as opposed to a general assessment of there being a large or small number of them). Nevertheless, we thought it was interesting to consider the possibility that a target message or stimulus would actually be perceived to have a greater number of positive (or lesser number of negative) arguments or features in the low rather than high prior information condition. According to the perceived knowledge account, prior information need not affect these factors. Instead, it affects the perception of how much information *a given set of arguments* (or features) represents. In other words, the perceived knowledge account suggests that people are gauging the extent to which they have been informed by a message (in a given direction) in a relatively thoughtful manner, rather than simply estimating that a message has greater or fewer persuasive arguments.

Method

Participants, design, and procedure

Forty-four undergraduates at Indiana University participated in partial fulfillment of a requirement for their introductory psychology courses. Overall, the procedure for Experiment 4 closely resembled the procedures from the earlier experiments. Participants were randomly assigned to conditions in a 2 (amount of prior information: high or low) × 2 (type of prior information: store or person) between participants factorial design in which everyone received initial information that was negative and target information that was positive.

Independent variables

Type of prior information. As in the first 3 experiments, the target message for all participants was about Brown's

Department Store. This message was always positive, and was identical to the favorable Brown's message used in the earlier experiments. Prior to receiving the target information, participants were randomly assigned to receive initial information about either a person or a store. This information was always negative, but covered the same basic topics as the prior information in the earlier experiments. When the initial stimulus was a person (David), the information was identical to the information used in the negative condition in Experiment 3. When the initial stimulus was a store (Smith's), participants received information about the same departments as before, but it was negative. For example, participants read that the camera department was expensive and poor in customer service.

Amount of prior information. Participants were randomly assigned to receive either a high or low amount of information about the initial stimulus. This manipulation was the same as in the earlier experiments. We pretested materials in both the person and store conditions to make sure the information in the low prior information condition was rated as negatively as the information in the high prior information condition.

Dependent measures

Perceived knowledge. Because a key goal in this study was to establish mediation through perceived knowledge rather than perceptions of mere number of arguments, we measured perceived knowledge immediately following the Brown's message. Participants received one question: "How much information do you feel you have about Brown's Department Store?" Responses were provided on a scale ranging from 1 to 9, anchored at *none at all* and *very much*.

Target attitudes. Attitudes toward Brown's were then assessed using the same items as in the earlier experiments ($\alpha = .93$).

Attitudes toward prior stimuli. To determine if the amount of information participants received about the initial stimulus affected attitudes toward that stimulus (as it should), we measured attitudes toward the prior stimuli. Following the measure of attitudes toward Brown's, participants received the same attitude items toward the initial stimulus, but these items were framed in terms of David ($\alpha = .94$) or Smith's Department Store ($\alpha = .96$), depending on condition.

Number estimates. Two items were included at the end of the experiment to assess the potential role of argument/feature number estimates in our effects: How many *positive* things would you say there are about Brown's Department Store? How many *negative* things would you say there are about Brown's Department Store? Participants responded to both items on scales ranging from 1 to 9, anchored at *no positive* (*negative*) *things at all* and *very many positive* (*negative*) *things*.

Results

Perceived knowledge and target attitudes

We began by submitting the perceived knowledge data to a 2×2 ANOVA with amount and type of prior information as the independent variables. Replicating our previous findings, there was a significant main effect of amount of prior information, $F(1, 40) = 9.58$, $p < .01$. Participants thought they had more knowledge about Brown's when they first received less ($M = 7.05$, $SD = 1.29$) rather than more ($M = 5.82$, $SD = 1.33$) information about the initial stimulus. Type of prior information had no effect on perceived knowledge, $F(1, 40) = 1.68$, $p > .20$, and there was no interaction, $F < 1$.

The attitude data were submitted to the same analysis. This analysis revealed only a main effect for amount of prior information, $F(1, 40) = 3.91$, $p = .05$. Attitudes toward Brown's were more favorable when participants first received a low ($M = 7.52$, $SD = 1.04$) rather than high ($M = 6.81$, $SD = 1.24$) amount of negative information about something else. No other effects were significant in this analysis, Fs < 1.

Mediation. We again used the Baron and Kenny (1986) technique to assess mediation. There was a significant effect of amount of prior information (dummy coded: 0 = low, 1 = high) on both perceived knowledge, $\beta = -.43$, $t(42) = -3.10$, $p < .01$, and attitudes, $\beta = -.31$, $t(42) = -2.08$, $p < .05$. In addition, perceived knowledge predicted attitudes, $\beta = .56$, $t(42) = 4.35$, $p < .001$. When both amount of prior information and perceived knowledge were included in a regression model predicting attitudes, the effect of perceived knowledge remained significant, $\beta = .52$, $t(41) = 3.66$, $p < .01$, but the direct effect of amount of prior information did not, $\beta = -.08$, $t(41) = -.55$, $p > .58$. The mediational pathway was significant ($z = 2.49$, $p = .01$).

Attitudes toward the prior stimulus

Analysis of attitudes toward the prior stimulus revealed the expected pattern. That is, amount of prior information affected attitudes toward the prior stimulus, $F(1, 40) = 4.77$, $p < .04$, such that attitudes toward the prior stimulus were more favorable when participants received less ($M = 3.97$, $SD = 1.55$) rather than more ($M = 3.06$, $SD = 1.41$) negative information about it. There was also an effect of type of prior information on attitudes toward the prior stimulus, $F(1, 40) = 5.56$, $p < .03$. Overall, people liked the person ($M = 4.06$, $SD = 1.34$) more than they liked the store ($M = 3.05$, $SD = 1.56$). There was no interaction between amount and type of prior information, $F < 1$.

Even though the pattern of data for target attitudes was not compatible with the evaluative contrast interpretation, it is possible that target attitudes were affected by evaluative *assimilation*. Indeed, people liked both the initial and target stimulus less when there was a large rather than small amount of negative prior information. To explore this possibility, we conducted a mediational analysis of the target atti-

tude data using attitudes toward the prior stimulus as a potential mediator. There was a significant effect of amount of prior information on both prior attitudes, $\beta = -.30$, $t(42) = -2.04$, $p < .05$, and target attitudes, $\beta = -.31$, $t(42) = -2.08$, $p < .05$. However, evaluative assimilation would imply that prior attitudes should be positively related to target attitudes. In contrast to this prediction, attitudes toward the prior stimulus were negatively related to target attitudes, $\beta = -.44$, $t(42) = -3.14$, $p < .01$. Furthermore, when both amount of prior information and attitudes toward the prior stimulus were included in a regression model predicting target attitudes, both predictors remained significant, $\beta = -.48$, $t(41) = -3.77$, $p = .001$, and $\beta = -.58$, $t(41) = -4.56$, $p < .001$, respectively. In fact, the direct effect from amount of prior information to target attitudes showed a marginal *increase* in strength ($z = 1.65$, $p < .10$) in this analysis.

Number estimates

Finally, we analyzed participants' estimates of the number of positive and negative features Brown's had. Neither of the individual items showed any significant effects across conditions, Fs < 1.23, ps > .27, and measures that combined the two items (e.g., positive estimate − negative estimate) also showed no effects, Fs < 1.

Discussion

Even when prior information was negative and target information was positive, less prior information led to more favorable target attitudes than did more prior information. This effect is consistent with perceived knowledge contrast, but not with evaluative contrast. Bolstering this notion, perceived knowledge again mediated the effect of prior information on target attitudes. Additional analyses also eliminated the possibility of an evaluative assimilation explanation. Although we suspect that evaluative contrast and assimilation play a role in attitudes and persuasion under some conditions, these phenomena cannot explain the present findings.

Also important, there were no differences across conditions in participants' perceptions of the number of positive or negative features associated with the target object. This finding suggests that when prior information was low, participants inferred that they had more knowledge about Brown's, which affected attitudes, but they did not simply estimate that there were more positive or fewer negative things about Brown's. Presumably, participants knew about how many arguments the Brown's message had, or how many positive features Brown's itself had, but they inferred that they were more informed in the low rather than high prior information condition. As predicted, then, the mechanism appears to involve a relatively thoughtful metacognitive inference that one has gained much or little knowledge in a particular direction from a persuasive message. This inference stems from comparing one's knowledge of the target to one's knowledge about other items in the surrounding context.

General discussion

The present research demonstrates that prior persuasive messages can affect the persuasiveness of subsequent persuasive messages. Target messages had a greater impact on attitudes when they were preceded by an initial message about something else containing relatively less rather than more information, and this effect was mediated by perceived knowledge with respect to the target stimulus. These effects were quite robust in the present experiments, occurring regardless of the relevance or valence of the prior message. One of the most important features of the current research is that it demonstrates that attitudes can be influenced by the perceived amount of information or knowledge a message conveys in the absence of *any* differences in *actual* information or knowledge. This effect is inherently different from what we know about numerosity or amount-of-information effects from past research, in which it has always been the actual amount of information that has varied.

Across experiments we provided consistent mediational evidence for the role of perceived knowledge. We also ruled out a number of alternative mechanisms along the way. In Experiment 1, we measured self-reported elaboration, actual elaboration, and free recall, and found no differences along any of these dimensions across conditions (see also *footnote 2*). In Experiment 3, we tested a familiarity mechanism for our effects and found no support for this mechanism. In Experiment 4, we eliminated the possibility that our effects might have been driven by evaluative contrast or evaluative assimilation. Overall, then, the data are most consistent with the position that the metacognitive perception of knowledge gained from a message was the key variable.

How thoughtful are these processes?

One important question based on these initial findings involves the role of elaboration, or extent of thinking, in the current effects (see Chaiken, Liberman, & Eagly, 1989; Petty & Cacioppo, 1986). The current studies provided clear evidence across a variety of measures (i.e., amount of recall, attitude–recall correlations, number of thoughts, attitude–thought correlations, and self-reported elaboration) that elaboration did not differ as a function of our experimental manipulations. Nevertheless, an intriguing question remains: Do the current effects reflect a relatively high or low elaboration phenomenon? Interestingly, the persuasion literature points to both possibilities. On the one hand, people have been found to be particularly susceptible to amount of persuasive information under low elaboration conditions (e.g. Petty & Cacioppo, 1984; Tormala, Petty, & Briñol, 2002). On the other hand, there is considerable recent evidence that at least some metacognitive processes exert greater impact on persuasion under high elaboration conditions (e.g. Petty, Briñol, & Tormala, 2002; Tormala & Petty, 2004a, 2004b), even when those phenomena have

traditionally been viewed as operating at the low end of the elaboration continuum (e.g., head nodding, Briñol & Petty, 2003; ease of retrieval, Tormala et al., 2002).

Although our studies were not designed to address this particular issue, they do suggest that perceived knowledge contrast occurs when elaboration is high. In Experiment 1, attitudes were significantly and positively correlated with thought favorability, which is a hallmark of high elaboration (e.g. Petty & Cacioppo, 1986). Moreover, the failure of recall to account for the attitude effects in Experiments 1 and 2 suggests that people were evaluating the target store in an active, on-line, fashion rather than in a more memory-based way (see Hastie & Park, 1986; McConnell, 2001; Tormala & Petty, 2001).

Based on several markers in the present experiments, then, we view the perceived knowledge contrast effect as a kind of *metacognitive* numerosity inference, whereby people thoughtfully reflect upon the information received from a message, and determine whether it represents much or little knowledge. This, in turn, contributes to attitudes. When people believe that they have much rather than little favorable knowledge, they are more positive. When people believe they have much rather than little unfavorable knowledge, they are more negative. Thus, there is partial conceptual overlap with the classic cue-based numerosity heuristic, because we are interested in perceptions of amount of information, but there is also an important difference. Specifically, we have shown that people can perceive the *exact same* message as giving them more or less issue-relevant knowledge (a heretofore unexplored possibility in the persuasion literature), and then infer that more or less agreement with the message is warranted. Of course, while we submit that these effects are thoughtful in nature, we acknowledge that there was no low elaboration condition for comparison in any of our experiments. Consequently, future research more systematically examining the moderating role of elaboration would be useful.

Implications

One interesting contribution of the present research is that it sheds light on a new means of persuasion. By altering the amount of information people have about other recently encountered stimuli, a context can be created that is ripe for persuasion before the target message is even presented. Such an approach could help "grease the wheels" for change before people erect barriers and defenses in the service of resistance. Of course, whereas a prior message about something else with little support can increase the impact of a target message, a prior message with much support can *undermine* that impact. Carefully controlling the persuasive context, then, may be one key to maximizing the impact of target persuasive advocacies. In future research, we intend to examine a host of other kinds of context effects that might be observable in persuasion settings.

The present research may also speak to important issues in judgment and decision making. Fox and Weber (2002), for example, have found that people are more willing to place bets on moderately unfamiliar events after they have first been reminded of less rather than more familiar events. According to this research, decisions in uncertain contexts can be driven by comparative ignorance versus competence on other topics (see also Fox & Tversky, 1995). The current findings contribute to this literature by disentangling perceived familiarity per se (which should always make something more attractive) and perceived knowledge, which could make something more or less attractive depending on the nature of the knowledge. Furthermore, the current work indicates that prior information can be taken into account and affect judgments even when it bears no logical connection whatsoever to the target issue or information.

Assimilation

In this research we emphasized the role of contrast in persuasion. Our focus on contrast was driven by the observation that contrast effects in general tend to occur under conditions common to persuasion situations. For example, contrast is more likely than assimilation to occur when the standard of comparison is an exemplar rather than a category, when the target stimulus is clear rather than ambiguous, and when the context and target stimuli are different in some salient way (see Mussweiler, 2003, for a review). These conditions are generally reflected in many real life persuasion situations, as well as in the current research. It is quite likely, however, that context effects in persuasion situations are sometimes more assimilative in nature. For example, if the prior and target stimuli were similar in some salient way (e.g., two department stores that belong to the same chain or corporation), perceptions of the second message might assimilate to perceptions of the first message. Under these circumstances, a low amount of information in an initial message might *reduce* perceived target knowledge, thereby undermining persuasion. We think this is an intriguing possibility, and a useful avenue for future work.

Coda

The current research demonstrates a new phenomenon in persuasion. At the same time, this research speaks to issues of longstanding interest in social psychology. In particular, our findings reaffirm the need to consider the context in which persuasion, or attitude formation and change more generally, occurs (see Sherif & Hovland, 1961). After all, persuasion does not typically occur in isolation from other messages or attitude objects. On the contrary, people very frequently receive persuasive messages in the context of other messages. As the present research attests, both relevant and irrelevant prior messages can affect perceptions of target persuasive messages and, thus, determine the impact of those messages. Our

hope is that our work will stimulate new research on the context of persuasion, and innovative applications of these findings to practical problems in the persuasion domain.

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