Persuasion, Interrupted: The Effect of Momentary Interruptions on Message Processing and Persuasion

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Marketers often seek to minimize or eliminate interruptions when they deliver persuasive messages in an attempt to increase consumers' attention and processing of those messages. However, in five studies conducted across different experimental contexts and different content domains, the current research reveals that interruptions that temporarily disrupt a persuasive message can increase consumers' processing of that message. As a result, consumers can be more persuaded by interrupted messages than they would be by the exact same messages delivered uninterrupted. In documenting this effect, the current research departs from past research illuminating the negative effects of interruptions, and delineates the mechanism through which and conditions under which momentary interruptions can promote persuasion.

Keywords: interruption; persuasion; attitude change.

> "We have gone from the Iron Age to the Industrial Age to the Information Age to the Age of Interruption. All we do now is interrupt each other or ourselves with instant messages, e-mail, spam or cellphone rings. Who can think . . . under such conditions?"
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> —Thomas L. Friedman, *New York Times,* 2006

People are constantly interrupted. For example, when consumers read news articles, watch advertisements, or scan product reviews, they can be interrupted by any number of events or tasks that take their attention away from the information they are processing. Imagine a consumer who begins to watch a news report online describing the potential benefits of a new product. After a few moments, the report is interrupted with a period of loading or video buffering. Following this momentary interruption, the report resumes and the consumer finishes watching it. The current research explores the effect of this interruption on persuasion—for example, the effect of the news report on consumers' attitudes or behavioral intentions toward the new product it featured. More generally, when a consumer is temporarily interrupted while processing a persuasive message, does that message have more or less impact on attitudes and behavioral intentions than it would have had if it was processed without interruption?

Intuitively, it seems reasonable to surmise that interruptions would undermine persuasion. For instance, perhaps interruptions reduce processing activity by taking attention away from the focal (interrupted) message. Indeed, if a message recipient's attention is momentarily drawn away by an interruption, his or her ability to continue processing the original message may be compromised, reducing elaboration on, and retention of, the message's core arguments. Consistent with this intuition, marketers and other influence practitioners often seek or request their targets' undivided attention while delivering their messages, presumably to maximize processing of those messages and thus increase their likelihood of influencing recipients' attitudes

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and behaviors. For example, marketing executives teach salespeople to "minimize interruptions and disruptions" during sales pitches (Novak 2013), and marketing textbooks advise marketers to seek consumers' "undivided attention" when delivering promotional messages (Belch and Belch 2011). Although we do not contest the notion that more attention to a persuasive message can enhance its impact (e.g., Petty and Cacioppo 1986), the current research questions the conventional wisdom to always eliminate interruptions. More specifically, we hypothesize that, under specifiable conditions, message interruptions can *increase* processing and thus promote rather than undermine persuasion.

INTERRUPTIONS

There are different forms of interruptions. Some are events that occur concurrently with a focal task and thus pull attention away and reduce the amount of thinking about that task. For example, research reveals that mentally rehearsing an eight-digit number or visually tracking the location of a moving stimulus reduces processing of persuasive messages as well as other types of information (e.g., Aydinoğlu and Krishna 2011; Festinger and Maccoby 1964; Mao and Krishnan 2006; Petty, Wells, and Brock 1976; Tormala and Petty 2004). Generally speaking, because this type of interruption happens concomitantly with the focal task, it functions as a distraction that creates cognitive load and lowers people's processing resources. A second type of interruption is one in which an intervening event disrupts a task and permanently prevents individuals from returning to it, even if they had wanted to do so. Research investigating this type of interruption reveals that when an individual is prevented from completing a task, that task is better remembered later on (Zeigarnik 1927). Zeigarnik argued that this effect occurs because an impediment to task completion fosters unresolved tension and a need for completion. Recent research suggests that such interruptions can prompt individuals to satisfy this need for completion in domains unrelated to the interrupted task (Kupor, Reich, and Shiv 2015).

The current research takes a different tack. Our interest is in events or tasks that momentarily prevent an individual from completing an activity, but whose conclusion allows the individual to resume the original activity and complete it (Coraggio 1990; Silvera et al. 2005; Speier et al. 1999). Like distraction or cognitive load, this type of interruption is pervasive in daily life. For example, the ubiquitous spinning wheel displayed during a momentary pause for video loading routinely interrupts individuals' receipt of information online. Likewise, while reading or thinking about a focal topic, people are regularly asked to pause and do something else. For instance, while reading a report at work, an employee might be asked to halt briefly and help with another task before returning to the original activity. The present research seeks to understand the impact that a momentary interruption of this nature might have on message processing and persuasion. Unlike continual distraction and cognitive load, which have received substantial empirical attention in social and consumer psychology, scant research has been devoted to this type of interruption—that is, to the momentary pause that allows a person to return to the original activity.

Some research has examined the effects of these kinds of momentary interruptions in other domains, and in general the effects have been observed to be negative. For example, frequent momentary interruptions have been shown to lead to performance errors among airline pilots (Latorella 1996), mistakes among hospital nurses (Drews 2007), dispensing errors among pharmacists (Flynn et al. 1999), and planning errors among lab participants (Speier et al. 1999). Consequently, a great deal of research on interruptions concludes with recommendations on how to minimize them (e.g., Bailey and Konstan 2006; Speier et al. 1999).

INTERRUPTIONS AND PERSUASION

Departing from past research, we explore the possibility that a single momentary interruption can sometimes have positive consequences for persuasion. Previous research has not examined the effect of this kind of interruption on persuasion, let alone documented its positive effects. Thus we know virtually nothing about the differential effects of momentarily interrupted versus uninterrupted messages on consumers' attitudes and behavioral intentions. This is surprising given both the frequency of this sort of interruption in everyday life and the long-standing importance of persuasion in the consumer behavior literature.

As noted, researchers have investigated the consequences of other types of interruptions on persuasion. For example, a wealth of research has explored cognitive load and related manipulations that simultaneously compete for consumers' attention while they process persuasive messages. This literature reveals that these kinds of interruptions tend to reduce message processing (e.g., Festinger and Maccoby 1964; Petty et al. 1976; Tormala and Petty 2004). One study also provided evidence that the second type of interruption described earlier—in which an individual is interrupted during a task and never allowed to return to it—can play a role in persuasion (Worchel and Arnold 1974). In this study, a taped recording appeared to break during the final sentence of a counterattitudinal message, preventing participants from receiving the message's conclusion. In a control condition, participants heard the full message with no interruption. The researchers found that when the interruption was paired with a cognitive dissonance induction (in which participants were induced to choose to listen to the counterattitudinal message in the first place), it elicited greater attitude change. However, when the interruption was not accompanied by a cognitive dissonance induction, it did not

impact attitude change. The authors conjectured that the interruption amplified the arousal participants were already experiencing after choosing a counterattitudinal message, and this elevated arousal increased participants' need to change their attitudes in line with the message they had selected. Although Worchel and Arnold did not test the effect of interruptions as we define them (i.e., momentary pauses in message processing), their work provides the only evidence to date that a discrete interruption event might sometimes promote the persuasive impact of a message. The current research dives deeper into exploring this possibility.

Specifically, in contrast to research suggesting that continuous interruptions (à la cognitive load) can *decrease* message processing, we explore the possibility that momentary interruptions can exert the opposite effect and *increase* processing. We hypothesize that when an interruption disrupts a message and temporarily prevents a consumer from receiving the rest of the information, it can initiate feelings of curiosity about what the rest of the message might say. This prediction is grounded in classic and contemporary research on goal pursuit. For example, research suggests that any task that one intends to complete can constitute a goal, and that individuals who have initiated goal pursuit find the goal to be more attractive and are more motivated to complete it (Jhang and Lynch 2015). Moreover, an interruption that temporarily impedes goal pursuit heightens the attractiveness of the goal even further (Mischel and Masters 1966).

Drawing from this research, we predict that when an interruption momentarily prevents message processing, completing message processing becomes more attractive. We examine a particular manifestation of this increased attractiveness in the context of message processing—curiosity (see also Lowenstein 1994). We submit that a momentary message interruption can make consumers more curious about what the rest of a message might say. When the consumer returns to the message after the interruption concludes, we predict that this increased curiosity causes the individual to process the rest of the message more deeply than if he or she had not been interrupted in the first place. Consistent with this reasoning, research suggests that curiosity prompts an intrinsic motivation to obtain further information, which in turn boosts information seeking and processing (Hunt 1963; Lowenstein 1994; Olson, Camp, and Fuller 1984; Peters 1978). This increased processing, in turn, should increase the persuasive impact of the message.

If such an interruption effect does exist, and if increased processing—or elaboration—drives it, a variety of constraints on the effect seem likely. First, the timing of the interruption should be an important determinant of its effect. For example, if an interruption pauses the final moments of a persuasive message (when there is little persuasive information remaining), elevated processing following that interruption is unlikely to boost persuasion. Generally speaking, the less (compelling) information there is to process, the less an increase in processing would be expected to boost persuasion. When there is more information remaining to process, elevated processing has greater potential impact. Hence our elaboration account suggests that momentary interruptions will be more likely to increase persuasion when they are inserted during the beginning of a persuasive message (when there are compelling arguments remaining) rather than at the end (i.e., after the delivery of the persuasive arguments has concluded). Of course, if an interruption pauses the ending of a message that contains a compelling persuasive argument in its conclusion, interruptions could still enhance persuasion. To shed light on our mechanism (and highlight a boundary condition on the effect), however, a more informative test involves an interruption that follows all core persuasive arguments in a message. Thus we hypothesize:

> **H1:** Momentary interruptions increase persuasion when they are inserted during the beginning of a persuasive message, but not when they occur at the end (i.e., when there is little or no compelling persuasive information remaining).

Drawing on the same core logic, because increased elaboration increases discrimination between strong and weak arguments, a momentary interruption should only increase persuasion when the interrupted message is strong, or compelling. Indeed, considerable research reveals that increased elaboration increases persuasion in response to strong arguments but tends to have no effect or even reduces persuasion (i.e., backfires) when arguments are weak (e.g., Karmarkar and Tormala 2010; Petty and Cacioppo 1979, 1986; Petty, Cacioppo, and Goldman 1981; Petty, Cacioppo, and Schumann 1983; Sanbonmatsu and Kardes 1988). This increased sensitivity to argument quality occurs because increased elaboration augments the proportion of favorable (unfavorable) thoughts generated in response to strong (weak) arguments, which in turn increases (decreases) agreement with the persuasive message (Petty and Cacioppo 1979).

> **H2:** Momentary interruptions increase persuasion under strong but not weak argument conditions.

Finally, if the proposed interruption effect is driven by increased elaboration, it should be most likely to occur under conditions in which elaboration is not already maximally high. After all, if a consumer is already engaging in high levels of elaboration, there might be little additional room for elaboration to increase as a result of a message interruption (for similar arguments and findings, see Petty, Cacioppo, and Heesacker 1981; Priester and Petty 1995). For instance, considerable research reveals that individuals differ in their general need for cognition (NFC; Cacioppo, Petty, and Kao 1984), or their intrinsic motivation to engage in thoughtful processing. Whereas individuals high in NFC enjoy and frequently engage in effortful thought, individuals low in NFC tend to be cognitive misers and avoid

effortful cognitive activities (see Cacioppo et al. 1996). Synthesizing this logic, we predict that momentary interruptions will not impact the degree of elaboration of high-NFC individuals because they are chronically motivated to process information irrespective of the situational factors that encourage or discourage it. In contrast, we suspect that interruptions will boost message elaboration among low-NFC individuals. Again, if interruptions increase processing of the remaining content of a message, they should be especially likely to influence individuals who are not already highly motivated to process that content.

H3: Momentary interruptions are more likely to increase processing and persuasion among low-NFC individuals than among high-NFC individuals.

OVERVIEW

In sum, past research has examined numerous types of interruptions. For example, research examining the simultaneous completion of multiple tasks reveals that such distraction produces cognitive load that undermines information processing. Other research has investigated the consequences of interruptions that permanently prevent individuals from returning to a focal task. In neither of these cases would we expect the predicted effects to emerge: the first type (continual distraction/multitasking) results in cognitive load that reduces processing, and the second type by definition prevents individuals from processing the remaining information in the interrupted message. Therefore, we focus our investigation on a third type of interruption: an event or task that momentarily prevents individuals from completing an activity, but whose conclusion allows individuals to resume their exclusive focus on the original activity and complete it. We test the effects of this type of interruption on persuasion.

STUDY 1

Study 1 offered an initial test of our interruption hypothesis. Specifically, we investigated whether an interruption during the processing of promotional product information (containing strong arguments) would increase willingness to pay for the promoted product, which we employed as a behavioroid measure of persuasion (see Ajzen, Brown, and Rosenthal 1996; Snyder and DeBono 1985).

Method

Participants and procedure. Sixty-three people at a large West Coast university participated in exchange for monetary payment. An experimenter blind to our hypothesis approached individuals on campus and asked them if they would be willing to participate in a market research study. The experimenter informed assenting participants that the goal of the study was to find out consumers' reactions to promotional materials designed by a new chocolate company called "GoHealthy Dark Chocolate Company" (although participants were led to believe this was a real brand, it was fictitious and created solely for the purposes of the study). The experimenter explained that the company had created promotional materials to market a recently developed dark chocolate truffle and that numerous health professionals had begun to investigate the health effects of the truffle's ingredients. The experimenter also explained that this research was forthcoming in the *Journal of the American Medical Association*. The experimenter stated that this research was described in greater detail in the promotional materials, and that she would now give the participant these materials. The experimenter next removed a piece of paper from her clipboard as if she was preparing to give the participant the promotional materials.

At this moment, in the Interruption condition, a confederate approached the experimenter and asked her for directions to a museum on campus. The experimenter provided directions, and the confederate walked away in the specified direction. This exchange lasted approximately 15 seconds. In order to hold constant any potential effect of simply observing a request for directions, the confederate in the No Interruption condition asked the experimenter for directions at the very outset of the experimenter's interaction, before she began delivering any information regarding the chocolate truffle or promotional materials. In short, participants in both conditions experienced all of the same events, but in the No Interruption condition the request for directions preceded the receipt of information about the focal topic (the chocolate truffle), whereas in the Interruption condition the request for directions interrupted the receipt of information about the focal topic.

Next, the experimenter gave each participant the promotional materials that featured strong arguments promoting the truffle. For instance, the materials noted that the truffle was very tasty and had numerous health benefits. After reading the materials, participants were queried for their willingness to pay for the truffle. Specifically, they were informed that "one Godiva truffle costs about 75 cents and one Hershey's Kiss costs about 5 cents," and were asked to indicate the most that they would be willing to pay for one GoHealthy truffle. Finally, participants were debriefed.

Results and Discussion

As predicted, participants reported a higher willingness to pay in the Interruption condition ($M = \$0.94$, standard deviation [SD] $= .60$) than in the No Interruption condition ($M = \$0.62$, $SD = .28$), $t(61) = 2.78$, $p = .007$ (Cohen's $d = .68$). This result provides initial evidence for the notion that interruptions can at least sometimes increase a message's persuasive impact. Again, all participants received the exact same message in this study; the only thing that

varied was the timing of the confederate's request for directions. When the request interrupted the delivery of the message, that message had greater impact.

STUDY 2

Our central hypothesis is that interruptions can increase the persuasive impact of a message because interruptions boost elaboration on the remaining message content. To permit an initial test of this process, study 2 included a traditional thought-listing procedure (Cacioppo and Petty 1981). Past research reveals that increased (decreased) elaboration produces a higher (lower) proportion of positive thoughts in response to strong arguments (Petty and Cacioppo 1986). Hence this procedure allowed us to measure participants' cognitive responses and compute a thought-favorability index to assess the role of cognitive responses in mediating the effect of interruptions on persuasion. If thought favorability mediated this outcome, as predicted, it would provide evidence for the mediating role of information-processing differences in the current effect (see Karmarkar and Tormala 2010; Wegener et al. 1995).

We also tested a potential boundary on the interruption effect. In accord with our elaboration account, we predicted that interruptions boost persuasion when they occur at the beginning of, or early on in, a persuasive message. By contrast, we postulated that interruptions occurring at the end of a persuasive message (e.g., after the presentation of the core arguments) would fail to yield the same persuasive impact. Indeed, if interruptions impact persuasion by increasing processing of subsequent message content, they should be less likely to increase persuasion when they follow the core argumentation. Study 2 explored this possibility.

Study 2 also had several additional goals. First, we aimed to address a potential alternative account for our findings. It could be argued that interruptions boost persuasion because they induce negative affect or mood that can increase information processing (Schwarz 1990). In study 2, we assessed mood to investigate this possibility. Second, we tested the interruption effect in a different context. To that end, we showed participants a portion of an actual *NBC News* clip from 2013 describing the health benefits of nuts. During this video, we inserted a common and ecologically valid form of interruption online: the loading of Internet content. Specifically, as participants viewed the video, the video froze and a typical loading wheel appeared to indicate that the video was loading.

Also important, whereas we administered a single measure assessing willingness to pay in study 1 (to stay in keeping with the study's market research cover story), study 2 employed a multi-item measure of behavioral intentions. In addition, we modified our control condition in study 2 to establish a pure baseline. In the first study, the control condition commenced with the event that interrupted the message in the interruption condition, before any message-relevant information had been shared with participants. This was done to hold constant any potential effect of simply observing the interruption event. Doing so enabled us to isolate the causal impact to the interruption as such, rather than to the event we happened to employ as an interruption. In other words, this design enabled us to conclude that it is not observing a request for directions that boosts message impact but having that request interrupt message delivery. However, this design also introduced a minor cost, which is that it did not provide a pure baseline allowing us to gauge message impact in the complete absence of the interruption event. For instance, could it be that the effect in study 1 was driven by the control condition, such that interference right before a message somehow reduced processing or increased negativity? Although this alternative seems unlikely, demonstrating the hypothesized interruption effect with a pure baseline control condition would empirically undermine the tenability of this alternative. Thus in study 2, we administered a true baseline control condition.

Method

Participants and procedure. A total of 117 undergraduates were recruited from a large West Coast university to participate in an in-lab study in exchange for monetary payment. When they arrived at the lab, all participants watched a message promoting the consumption of nuts. In particular, they watched 80 seconds of an actual *NBC News* report describing the results of a scientific study that found the consumption of nuts yielded substantial health benefits (Costello and Williams 2013). The NBC report contained several strong arguments in favor of nuts. For example, the segment noted that Harvard researchers found that the consumption of one ounce of nuts seven times a week reduced the likelihood of dying from heart disease, stroke, and cancer.

We used video editing software to insert a 4-second pause for loading (i.e., a spinning wheel) during the news report. In the Early Interruption condition, this loading wheel was inserted immediately before the reporter announced the study's findings and provided the core arguments promoting nuts (about 25 seconds into the news report). In the End Interruption condition, the loading wheel appeared after the presentation of the strong arguments had concluded (about 15 seconds from the end of the news report). Participants in the No Interruption condition did not experience any period of loading during the news report. We randomly assigned participants to one of these three conditions.

Dependent Variables

Behavioral intentions. After the video concluded, participants completed a four-item index of their behavioral intentions with respect to nuts. Specifically, participants were asked how likely they would be to purchase nuts in the future, how likely they would be to eat some nuts every day, and how likely they would be to recommend nuts to a friend or family number. Participants responded to each of these items on a 7-point scale (*1: Extremely unlikely; 7: Extremely likely*). Then participants read that the price of one ounce of nuts can vary from $1 to $7 as a function of the store and type of nut. Participants entered how much money they would be willing to pay for one ounce of nuts into an empty field. A factor analysis of these items yielded only one factor with an eigenvalue greater than one, so responses were standardized and then averaged into a composite index of behavioral intentions ($\alpha = .70$).

Thought favorability. Next, we measured cognitive responses by asking participants to list the thoughts they had as they watched the video. The instructions emphasized that participants should list only the thoughts that occurred to them while they watched the video, but not the thoughts that they had after the video concluded (instructions adapted from Cacioppo and Petty 1981). Below these instructions, participants typed all of the thoughts that they had while watching the video. On the ensuing screen, we presented participants with the thoughts they had listed and asked them to indicate whether each one was positive, negative, or neutral with respect to nuts and/or the video that they saw about nuts. We computed a thought-favorability index for each participant by subtracting the number of negative thoughts listed from the number of positive thoughts listed, and dividing that difference by the total number of positive and negative thoughts listed. Higher values thus reflected a greater frequency of positive relative to negative thoughts. This approach was adopted from past work on cognitive responses and persuasion (Briñol, Petty, and Tormala 2004; Petty, Ostrom, and Brock 1981).

Mood. Finally, mood was measured using the Positive and Negative Affect Schedule (Watson, Clark, and Tellegen 1988). We computed positive ($\alpha = .89$) and negative ($\alpha = .87$) mood indexes by averaging all of the positive and all of the negative items, respectively.

Results and Discussion

Behavioral intentions. We submitted each dependent measure to a one-way analysis of variance (ANOVA) with interruption condition as a three-level independent variable. As predicted, this analysis revealed a significant effect on behavioral intentions, $F(2, 114) = 3.80$, $p = .025$. Planned contrasts revealed that participants in the Early Interruption condition ($M = .24$, $SD = .71$) had more favorable behavioral intentions than participants in both the No Interruption condition ($M = -.11$, $SD = .77$; Fisher's LSD: $p = .031$; Cohen's $d = .47$) and the Late Interruption condition ($M = -.17$, $SD = .68$; Fisher's LSD: $p = .013$; Cohen's $d = .59$), which did not differ from each other (Fisher's LSD: $p = .702$).

Thought favorability. Analysis of participants' cognitive responses produced the same outcome as behavioral intentions. Again, we found a significant effect of interruption condition, $F(2, 114) = 7.06$, $p = .001$. Participants in the Early Interruption condition ($M = .41$, $SD = .61$) had a greater proportion of favorable thoughts than participants in both the No Interruption condition ($M = .06$, $SD = .70$; Fisher's LSD: $p = .025$; Cohen's $d = .53$) and the End Interruption condition ($M = -.16$, $SD = .70$; Fisher's LSD: $p < .001$; Cohen's $d = .87$), which did not differ from each other (Fisher's LSD: $p = .139$).

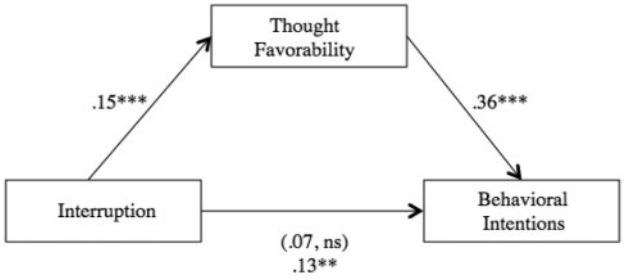
Mood. The same analysis on the mood indexes revealed no effect on either positive or negative mood ($F[2, 113] = 1.15$, $p = .321$; $F[2, 113] = .17$, $p = .848$). Moreover, each of the planned contrasts was also not significant (Fisher's LSDs: $p > .136$). These data are inconsistent with the notion that variations in mood underlie the current results.

Mediation. To test the mediating role of thought favorability in determining the effect of the interruption on behavioral intentions, we conducted a mediation analysis with orthogonal contrast coding (Rosenthal and Rosnow 1985) and following the bootstrapping procedures recommended by Hayes (2013). The first contrast compared the Early Interruption condition to the two other conditions. The second contrast compared the Late Interruption condition to the No Interruption condition. As hypothesized, thought favorability mediated the effect of the first contrast on behavioral intentions (95% confidence interval [CI], .0175 to .1083; see figure 1). Moreover, consistent with the finding of no differences in behavioral intentions or thought favorability between the No Interruption and Late Interruption conditions, thought favorability did not mediate the effect of the second contrast on behavioral intentions (95% CI, −.0098 to .1141).

In sum, these results conceptually replicate the results from study 1 with a different type of interruption, target topic, and experimental context. Also important, this study extends the findings in study 1 by providing direct evidence for the role of elaboration in guiding the effects of interruptions on behavioral intentions. In short, this experiment demonstrated that differences in participants' message-relevant thinking played a crucial role in driving the effect of interruptions on persuasion. Also important, by demonstrating the predicted effects with a pure baseline condition in the design, we can confidently infer that the

FIGURE 1

MEDIATION ANALYSIS (STUDY 2)



Note. The path coefficients are unstandardized betas. Values in parentheses indicate the effect of interruption on the dependent variable after controlling for the mediator. *$p<.05$ **$p<.01$ ***$p<.001$

interruption effect was driven by increased favorability in the Early Interruption condition.

STUDY 3

The results of studies 1 and 2 were consistent with our hypothesis that interruptions can increase the impact of a persuasive message and that this effect is driven by differences in elaboration. As noted earlier, we postulate that this increase in elaboration occurs because an interruption that temporarily disrupts a message initiates feelings of curiosity about what the rest of the message might say. We predict that this increased curiosity causes the interrupted individual to process the rest of the message more deeply than if he or she had not been interrupted in the first place. We test this curiosity hypothesis in study 3. In addition, we further gauged the robustness of the observed effect by testing it with a different message topic.

Method

Participants and procedure. A total of 250 participants recruited from Amazon's Mechanical Turk (MTurk) took part in an experiment in exchange for monetary payment. As in study 2, all participants viewed a real news clip. Unlike study 2, however, this time participants viewed 60 seconds of an *ABC News* video reporting the health benefits of coffee (Hubbard and Sawyer 2011). The video contained several strong arguments in favor of coffee. For example, the segment noted that Harvard and Swedish researchers discovered that coffee could reduce the likelihood of prostate cancer and breast cancer. As in study 2, we inserted a brief pause for loading (i.e., a spinning wheel) during the news report in the Interruption condition. This loading wheel was inserted immediately before the reporter announced the findings from the research study and delivered the core message content. Participants in the No Interruption condition experienced no pause for loading.

Dependent Variables

Curiosity. Immediately after the video, participants completed a four-item curiosity index. Specifically, they were asked to think back to the moment during the video in which they felt most curious about what the rest of the video would say, and then indicate how curious they had been at that moment (*1: Not at all curious; 9: Extremely curious*), how much they had wanted to see the rest of the video (*1: Not at all; 9: Very much*), how eager they had been to find out what the rest of the video might say (*1: Not at all; 9: Very much*), and how much they had wanted to know more information about the health benefits of coffee (*1: Not at all; 9: Very much*). A factor analysis of these items yielded only one factor with an eigenvalue greater than one, so responses were averaged into a composite curiosity index ($\alpha = .93$).

Behavioral intentions. Next, participants completed a four-item index of their behavioral intentions, as in study 2. Specifically, participants were asked how likely they would be to drink coffee tomorrow, how likely they would be to drink some coffee every day, and how likely they would be to recommend coffee to a friend or family member. Participants responded to each of these items on a 7-point scale (*1: Extremely unlikely; 7: Extremely likely*). Then participants read that the price of one cup of coffee can vary from $1 to $5 as a function of the coffee store and type of coffee. Participants entered how much they would be willing to pay for one cup of coffee into an empty field. A factor analysis of these items yielded only one factor with an eigenvalue greater than one, so responses were standardized and then averaged into a composite behavioral intentions index ($\alpha = .83$).

Thought favorability. Next, we measured thought favorability using the same procedure described in study 2.

Results and Discussion

Curiosity. As hypothesized, self-reported curiosity was greater among interrupted ($M = 6.82$, $SD = 2.00$) rather than uninterrupted ($M = 6.08$, $SD = 2.41$) participants, $t(248) = 2.65$, $p = .008$ (Cohen's $d = .34$).

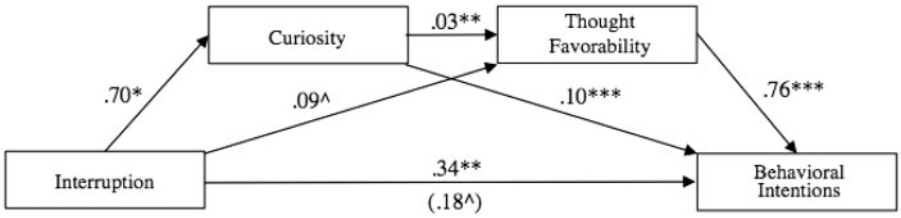
Behavioral intentions. Interrupted participants ($M = .14$, $SD = .74$) also reported more favorable behavioral intentions than did uninterrupted participants ($M = -.16$, $SD = .86$), $t(248) = 3.00$, $p = .003$ (Cohen's $d = .38$).

Thought favorability. Interrupted participants ($M = .65$, $SD = .33$) also had a greater proportion of favorable thoughts than did uninterrupted participants ($M = .54$, $SD = .37$), $t(221) = 2.39$, $p = .018$ (Cohen's $d = .32$).

Mediation. We predicted that interruptions enhance the persuasive impact of a message by fostering curiosity about the interrupted information, which in turn boosts

FIGURE 2

MEDIATION ANALYSIS (STUDY 3)



Note. The path coefficients are unstandardized betas. Values in parentheses indicate the effect of interruption on the dependent variable after controlling for the mediators. *^p<.10 *p<.05 **p<.01 ***p<.001*

message processing. Consistent with this prediction, a serial mediation model (Hayes 2013) revealed that the interruption increased the video's persuasive impact because the interruption boosted curiosity, which in turn boosted thought favorability, which enhanced behavioral intentions (95% CI for the indirect effect, .0495 to 2738; figure 2).

STUDY 4

The results of studies 1, 2, and 3 were consistent with our hypothesis that interruptions can increase the impact of a persuasive message by boosting curiosity about the interrupted information and thus actual processing of that information. Study 4 tested an important implication of this elaboration account. As noted earlier, relative differences in argument quality effects are a well-established indicator of differential processing of persuasive messages (Aaker and Lee 2001; Batra and Stayman 1990; Karmarkar and Tormala 2010; Petty et al. 1983). This is because people are more sensitive to the quality of arguments contained in persuasive messages when they process those messages more deeply (Karmarkar and Tormala 2010; Petty et al. 1983). Thus if interruptions boost persuasion by increasing message processing, the effect should emerge only when the interrupted message contains strong arguments. When the message contains weak arguments, this effect should attenuate or reverse. To test this hypothesis in study 4, we manipulated the strength of arguments contained in the persuasive message.

Also important, if the interruption effect is driven by *increased* elaboration, it should be especially likely to emerge when people are not already engaging in high levels of elaboration (see also Petty et al. 1981; Priester and Petty 1995). In other words, we predicted that the interruption effect is more likely to emerge when baseline levels of elaboration are relatively low (or moderate) and thus have ample room to increase. Conversely, when baseline elaboration levels are relatively high, the interruption effect should be less likely to emerge because there is less room for elaboration to grow.

We examined this hypothesis by investigating whether the interruption effect is moderated by NFC (Cacioppo et al. 1984). As described earlier, low-NFC individuals tend to be unmotivated to process information deeply; hence we predicted that interruptions would be most likely to boost processing among low-NFC individuals. Again, these are the individuals who have room for increased processing. In contrast, because high-NFC individuals are generally motivated to process information more deeply, we predicted that an interruption would not further augment processing among high-NFC individuals. High-NFC individuals' intrinsic motivation to engage in effortful thought should foster thorough elaboration regardless of interruption condition.

To examine these hypotheses, we presented high and low-NFC individuals with strong or weak arguments that were interrupted or not. We predicted a three-way interaction among these variables. More specifically, among low NFCs we expected to observe an interaction between interruption condition and argument quality, suggesting greater sensitivity to argument quality among interrupted than uninterrupted participants. Among high NFCs, we expected a main effect of argument quality, reflecting generally extensive message processing.

Finally, study 4 also had two other goals. First, we shifted our focus from measuring behavioral intentions to measuring attitudes, a traditional focus of persuasion research. Second, we changed the nature of our interruption event. In this study, participants were interrupted with instructions to complete a brief unrelated task. In daily life, individuals are frequently disrupted with brief questions, requests for favors, calls for assistance, and so on, from their coworkers, family members, and a variety of other sources. In study 4, we examined whether the interruption effect from studies 1, 2, and 3 would persist when we simulate this form of interruption.

Method

Participants and procedure. A total of 291 participants recruited from Amazon's MTurk took part in an experiment in exchange for monetary payment. Participants were randomly assigned to one cell of a 2 (Interruption vs. No Interruption) × 2 (Strong vs. Weak Arguments) design. All participants were asked to imagine that they were an administrator at a nutritionist's office, and that their boss asked them to read an article and let him know their opinion. Participants were informed that the article was on two separate screens. Next, participants read a brief introduction to an ostensible *USA Today* news story. Specifically, participants read that numerous health professionals were reporting that one of the single best things that one could do for one's health was to eat at least one box of GoHealthy cereal a week. Below this information, participants were prompted to click an arrow to read the full article. After participants read the full article, they completed measures assessing their attitudes. Finally, participants completed the NFC scale (Cacioppo et al. 1984).

Independent Variables

Interruption. Following the presentation of the administrative office scenario and a brief introduction to the message topic, and after clicking to continue to the article, participants in the Interruption condition were interrupted with instructions to complete a task for an unrelated one-minute survey. Paintings were displayed below these instructions, and participants were asked to list similarities and differences between the paintings. After completing this task, participants in the Interruption condition read the full article about GoHealthy cereal on the ensuing page. In contrast, participants in the No Interruption condition completed this same filler task at the beginning of the survey (prior to the presentation of the administrative office scenario), and then read the article introduction and full article without interruption. In short, participants in the No Interruption and Interruption conditions received all of the same information and completed the same tasks, but in the former condition the interruption task preceded the article introduction and full article, whereas in the latter condition it interrupted the article introduction and full article.

Argument quality. Participants in the strong argument condition read strong arguments in favor of GoHealthy cereal. For example, these arguments asserted that researchers at a prestigious university had discovered that GoHealthy cereal reduces the likelihood of cancer and heart disease. In contrast, participants in the weak argument condition read weak arguments in favor of GoHealthy cereal. For instance, these arguments noted that a group of high school students believed that GoHealthy may have prevented the flu among their classmates.

Need for cognition. Participants completed the 18-item version of the NFC scale (Cacioppo et al. 1984). The scale contains statements such as "I find satisfaction in deliberating hard and for long hours" and "Thinking is not my idea of fun" (reversed scored). Participants indicated the extent to which each statement characterized them on a 5-point scale (*1: Extremely uncharacteristic; 5: Extremely characteristic*). Responses were averaged to create a composite NFC score ($\alpha = .91$).

Dependent Variables

Attitudes. After participants read the article, they reported their attitudes toward GoHealthy cereal. Specifically, participants rated the cereal on a series of scales ranging from 1 to 9 with the following anchors: bad—good, unfavorable—favorable, negative—positive, and beneficial—harmful (reversed scored; items adapted from Briñol et al. 2004; Tormala and Petty 2002). A factor analysis of these items yielded only one factor with an eigenvalue greater than one, so responses were averaged into a composite attitudes index ($\alpha = .92$).

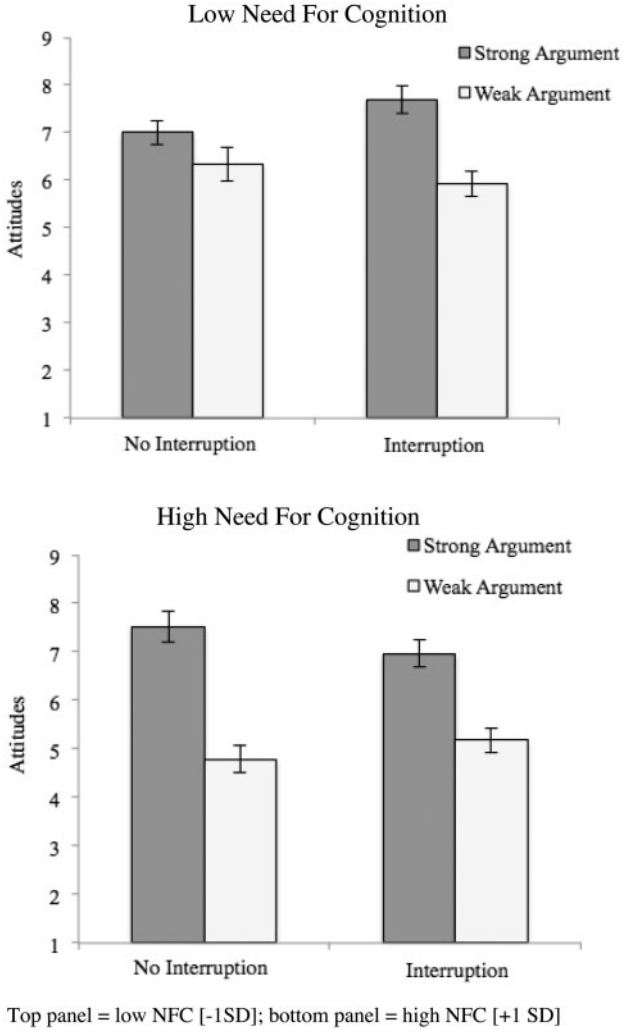
Results and Discussion

The attitude data were submitted to a multiple linear regression, with NFC (continuous), argument quality condition, and interruption condition as predictors. The regression revealed a main effect of argument quality, such that stronger arguments led to more positive attitudes, $b = 1.70$, $t(283) = 5.80$, $p < .001$. There also was a main effect of NFC, such that individuals with higher NFC had less favorable attitudes, $b = -1.09$, $t(283) = -3.01$, $p = .003$. A two-way interaction between NFC and argument quality also emerged, $b = 1.46$, $t(283) = 3.19$, $p = .002$, but there were no other main effects or two-way interactions (p values $> .22$). Most germane to our primary concerns, we found a significant three-way interaction, $b = -1.45$, $t(283) = -2.45$, $p = .015$.

As shown in figure 3, we decomposed this interaction using a spotlight analysis at 1 SD above and below the mean of NFC. At 1 SD below the mean of NFC (i.e., low NFC), there was a marginal interaction between interruption condition and argument quality on attitudes, $b = 1.10$, $t(283) = 1.86$, $p = .064$. Specifically, when arguments were strong, low-NFC participants were marginally more persuaded when they were interrupted rather than uninterrupted, $b = .70$, $t(283) = 1.80$, $p = .073$. Under weak argument conditions, this tendency was not observed, $b = -.40$, $t(283) = -.90$, $p = .371$. Viewed differently, when interrupted, low-NFC participants had more positive attitudes under strong rather than weak argument conditions, $b = 1.77$, $t(283) = 4.46$, $p < .001$. This argument quality effect became nonsignificant when low-NFC

FIGURE 3

ATTITUDES AS A FUNCTION OF INTERRUPTION CONDITION, ARGUMENT QUALITY, AND NEED FOR COGNITION (STUDY 4)



Top panel = low NFC [-1SD]; bottom panel = high NFC [+1 SD]

participants were uninterrupted, $b = .67$, $t(283) = 1.52$, $p = .130$.

At 1 SD above the mean of NFC (i.e., high NFC), the interaction between interruption condition and argument quality did not reach significance, $b = -.95$, $t(283) = -1.64$, $p = .101$. Both interrupted ($b = 1.79$, $t(283) = 4.70$, $p < .001$) and uninterrupted ($b = 2.73$, $t(283) = 6.33$, $p < .001$) high-NFC participants had more positive attitudes under strong rather than weak argument conditions. Moreover, for high-NFC participants, there was no effect of the interruption manipulation under strong ($b = -.56$, $t(283) = -1.46$, $p = .146$) or weak ($b = -.38$, $t(283) = -.90$, $p = .369$) argument conditions.

In sum, interruptions produced greater argument quality effects among low- but not high-NFC individuals. Specifically, interrupted low-NFC participants were more persuaded under strong (vs. weak) argument conditions, whereas uninterrupted low-NFC participants did not show this argument quality effect. By contrast, high-NFC participants only showed a main effect of argument quality. Thus, people inclined to think more deeply, by default, generally processed the persuasive message carefully across conditions. It was those who were initially disinclined to think deeply that responded to the interruption, processing more deeply when they were interrupted versus when they were uninterrupted. This pattern provides further evidence for the role of *increased* processing as a driver of the interruption effect on persuasive message impact.

STUDY 5

Taken together, the first four studies provide converging evidence that momentary interruptions can increase persuasion in response to strong arguments by boosting elaboration. In study 5, we take an initial step toward reconciling this finding with previous literature that demonstrated the opposite result—that interruptions can decrease processing and thus decrease persuasion in response to strong arguments (e.g., Petty et al. 1976). As we noted earlier, previous studies have examined interruptions that occur concomitantly with the receipt of the focal information (i.e., cognitive load, or what we refer to as "distractions" in the current research). By contrast, our interest is in the consequences of momentary interruptions that temporarily obstruct message processing but then allow a person to return to the persuasive message and continue processing it unhindered. We theorize that it is this crucial difference in the temporal structure of the interrupting event that underlies our opposing effects. That is, we postulate that momentary interruptions as we define them can foster deeper processing, whereas more constant and concomitant interruptions (like those from past research) distract individuals and prevent deep processing.

We test this prediction in study 5. To do so, we examine relative differences in argument quality effects when individuals are momentarily interrupted versus continuously distracted. As noted, relative differences in argument quality effects are a well-established indicator of differential processing of persuasive messages. Hence if our effects depart from previous research because momentary interruptions boost processing while distractions hinder it, we would expect to observe greater argument quality effects under momentary interruption rather than distraction conditions.

Method

Participants and procedure. A total of 201 participants recruited from Amazon's MTurk took part in an experiment in exchange for monetary payment. Participants were randomly assigned to conditions in a 2 (Momentary

Interruption vs. Distraction) × 2 (Strong vs. Weak Arguments) between-participants design.

As in study 4, all participants viewed an ostensible *USA Today* news story. Unlike in study 4, however, this time the article featured arguments in favor of lowering the drinking age. Participants in the strong argument condition read strong arguments in favor of lowering the drinking age. For instance, these arguments asserted that the current minimum drinking age fuels hazardous binge drinking among underage individuals during the brief times that they have access to alcohol. Participants in the weak argument condition read weak arguments in favor of lowering the drinking age. For instance, the weak message noted that a group of high school students found no decrease in highway fatalities on a local two-lane highway since the minimum drinking age law had been instituted. While they read the arguments, participants in all conditions also listened to an audio recording of a male voice reading the arguments.

Participants were randomly assigned to experience a momentary interruption or continuous distraction. In the Momentary Interruption condition, participants were interrupted with instructions to complete an unrelated task following the introduction to the message. This time, however, the unrelated task required participants to count the number of times a red box and a blue box flashed on their computer monitor during a 150-second period. After 150 seconds elapsed, participants in the Momentary Interruption condition entered the number of times that each box color flashed. Next, these participants received the full arguments about lowering the drinking age on the ensuing screen. Participants in the Distraction condition completed the same 150-second box counting task while simultaneously receiving the focal message, which took about 150 seconds to deliver. Hence participants in all conditions counted the same number of boxes over an equivalent 150-second period; however, participants in the Distraction condition completed this task during their receipt of the focal information, whereas participants in the Momentary Interruption condition completed this task during a discrete period of interruption, after which they returned to the focal information uninterrupted.

Dependent Variables

Attitudes. Attitudes toward lowering the drinking age were measured as in study 4. A factor analysis of these items yielded only one factor with an eigenvalue greater than one, so responses were averaged into a composite attitudes index ($\alpha = .98$).

Behavioral intentions. Participants also completed a three-item index of their behavioral intentions with respect to lowering the drinking age. Specifically, they were asked how willing they would be to sign a petition in favor of lowering the minimum drinking age (*1: Not at all willing; 7: Completely willing*); how willing they would be to let us add their name to a list of people in favor of lowering the minimum drinking age (*1: Not at all willing; 7: Completely willing*); and whether they would vote for or against lowering the minimum drinking age (*1: Definitely vote for; 7: Definitely vote against;* reverse coded). A factor analysis of these items yielded only one factor with an eigenvalue greater than one, so responses were averaged into a composite behavioral intentions index ($\alpha = .88$).

Results and Discussion

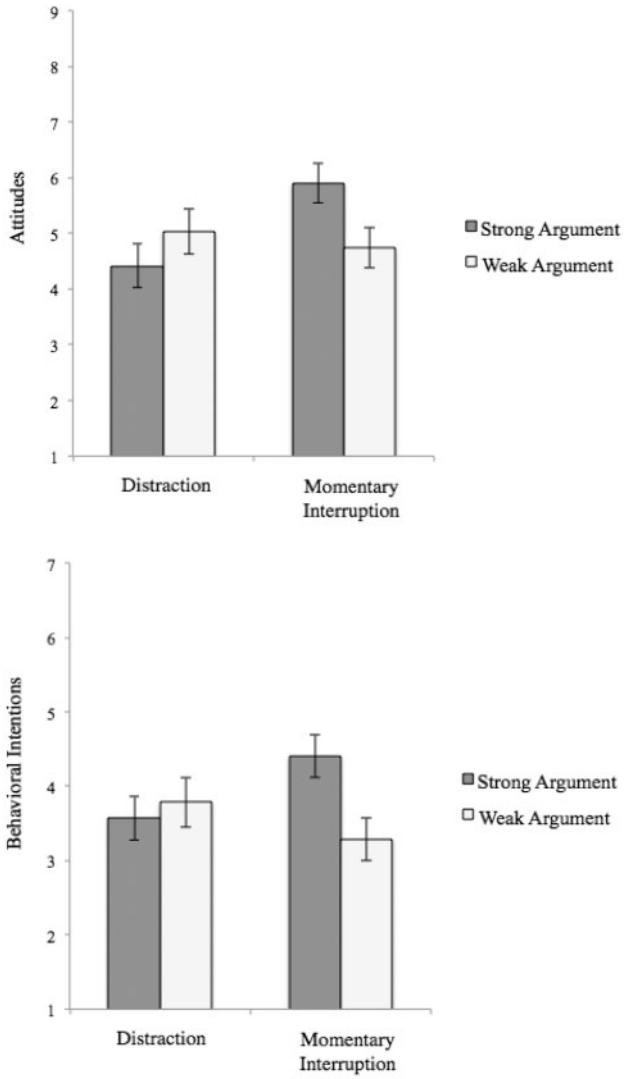
Attitudes. We submitted the attitude data to a 2×2 ANOVA with interruption condition and argument quality as the independent variables. This analysis revealed no main effects, F values < 2.44, p values $> .120$, but the predicted interaction emerged, $F(1, 197) = 5.47$, $p = .020$. As illustrated in figure 4, under strong argument conditions, participants who were momentarily interrupted ($M = 5.91$, standard error [SE] $= .35$) had more favorable attitudes toward lowering the drinking age than did their distracted counterparts ($M = 4.42$, SE $= .39$), $F(1, 197) = 8.09$, $p = .005$ (Cohen's $d = .55$). Under weak argument conditions, interruption condition did not impact attitudes; momentarily interrupted participants ($M = 4.75$, SE $= .37$) reported attitudes that were equivalent to those of distracted participants ($M = 5.04$, SE $= .41$), $F(1, 197) = .28$, $p = .595$. Viewed differently, the interaction revealed an argument quality effect on attitudes when participants were momentarily interrupted, $F(1, 197) = 5.06$, $p = .026$ (Cohen's $d = .43$), that disappeared when they were distracted, $F(1, 197) = 1.23$, $p = .268$.

Behavioral intentions. The same 2×2 ANOVA on behavioral intentions revealed no main effects, F values < 2.23, p values $> .137$, but the predicted interaction again emerged, $F(1, 197) = 4.94$, $p = .027$. As illustrated in figure 4, under strong argument conditions, participants who were momentarily interrupted ($M = 4.40$, SE $= .29$) had more favorable behavioral intentions with respect to lowering the drinking age than did distracted participants ($M = 3.57$, SE $= .29$), $F(1, 197) = 4.14$, $p = .043$ (Cohen's $d = .40$). Under weak argument conditions, the behavioral intentions of momentarily interrupted participants ($M = 3.29$, SE $= .29$) were equivalent to those of distracted participants ($M = 3.79$, SE $= .34$), $F(1, 197) = 1.29$, $p = .258$. Viewed differently, the interaction revealed an argument quality effect when participants were momentarily interrupted, $F(1, 197) = 7.56$, $p = .007$ (Cohen's $d = .53$), that disappeared when they were distracted, $F(1, 197) = .25$, $p = .622$.

In sum, the exact same (box counting) task produced an argument quality effect when it functioned as a momentary interruption that disappeared when it functioned as a simultaneous distraction. As previously noted, argument quality

FIGURE 4

ATTITUDES (TOP PANEL) AND BEHAVIORAL INTENTIONS (BOTTOM PANEL) AS A FUNCTION OF INTERRUPTION CONDITION AND ARGUMENT QUALITY CONDITION (STUDY 5)



differences are a well-established indicator of increased processing (e.g., Karmarkar and Tormala 2010; Petty and Cacioppo 1979). Hence these results help reconcile our findings with previous literature documenting the negative consequences of interruption tasks on message processing. Specifically, the current results suggest that the temporal nature of the interruption shapes its persuasive consequences. Interruptions that are constant distractions are well known to decrease processing; our studies demonstrate that momentary interruptions can have the opposite effect.

GENERAL DISCUSSION

Across five studies, we found that momentary interruptions can increase message processing and persuasion. We demonstrated that interruptions increased processing by heightening curiosity (study 3), and that these processing differences mediated the effect of interruptions on persuasion (studies 2 and 3). Also consistent with this elaboration account, we found that interruptions did not increase persuasion when they occurred after the core message content had been presented (study 2), and that interruption-induced argument quality effects (a well-established indicator of differential processing of persuasive messages) were especially likely to emerge when individuals were not by default highly likely to process (study 4). Finally, we contrasted the effects of momentary interruptions versus continuous distractions (study 5), underscoring the difference between the current findings and past research on interruption effects in persuasion.

Importantly, we observed consistent effects across studies despite numerous changes in study context and materials. For instance, we found the predicted interruption effect in a field context (study 1), an in-lab experimental setting (study 2), and in online studies (studies 3, 4, and 5). We found it using different operationalizations of interruptions including a human interruption (study 1), a pause for video loading (studies 2 and 3), and two different interrupting tasks (studies 4 and 5). We also found evidence for the interruption effect across different content domains including a public policy issue (study 5) and four different products (studies 1, 2, 3 and 4).

Taken together, these results suggest that momentary interruptions can play an important and generalizable role in increasing processing. Whether that processing translates into persuasion depends on the stimuli (e.g., argument quality, interruption timing). In sum, we offer a novel take on interruptions that often have been viewed in terms of distraction effects or sources of error in judgment. Along with Nelson and Meyvis (2008), who found that momentary interruptions can intensify positive (as well as negative) hedonic experiences by disrupting adaptation, our research demonstrates that interruptions can sometimes yield positive consumer consequences. Our hope is that this research will encourage scholars to delve deeper into understanding the psychology of interruptions that act as momentary pauses in information processing.

Alternative Explanations

In the majority of our studies we made an effort to hold constant the potential consequences of the specific interruption event (i.e., the request for directions in study 1, the picture task in study 4, and the counting task in study 5) by administering the event in all conditions. In other words, those studies varied not the presence of the interruption

event but rather the *timing* of that event. Could it be that the current results stem from arousal produced by the timing of the interruption event? Past research suggests that interruptions can induce arousal (Worchel and Arnold 1974). Of importance, however, past research suggests that arousal *decreases* processing (e.g., Rydell et al. 2008; Sanbonmatsu and Kardes 1988). For example, arousal decreases discrimination between strong and weak arguments (Sanbonmatsu and Kardes 1988), which is precisely the opposite of the pattern revealed in studies 4 and 5.

Nevertheless, to directly examine the possible role of arousal in our findings, we ran a separate study in which 81 participants were interrupted or not while reading strong arguments. Immediately after reading the arguments, all participants indicated their mood and arousal on the Affect Grid (Russell, Weiss, and Mendelsohn 1989). The Affect Grid is a 9×9 matrix that treats mood and arousal as orthogonal dimensions. The vertical axis corresponds to arousal and ranges from low (bottom) to high (top); the horizontal axis corresponds to mood and ranges from unpleasant feelings (left) to pleasant feelings (right). Participants selected the cell that represented their current feelings of mood and arousal. Our analysis revealed that interrupted participants ($M_{Arousal} = 4.80$, $SD_{Arousal} = 1.98$; $M_{Affect} = 5.30$, $SD_{Affect} = 1.67$) and uninterrupted participants ($M_{Arousal} = 5.10$, $SD_{Arousal} = 2.15$; $M_{Affect} = 5.46$, $SD_{Affect} = 1.73$) experienced equivalent levels of arousal ($t[79] = .65$, $p = .519$) and affect ($t[79] = .43$, $p = .667$). Thus it appears unlikely that arousal played a key role here.

Although we can only speculate why arousal did not drive the current results, it could be that our specific interruption manipulations simply did not produce arousal, or at least not enough arousal to affect the results. Of course, we investigated the consequences of a *single* interruption; perhaps arousal would increase with a greater number of interruptions (Xia and Sudharshan 2002). Indeed, research suggests that multiple momentary interruptions can produce negative consequences because numerous momentary interruptions can foment arousal as well as information overload (Speier et al. 1999; Xia and Sudharshan 2002). If true, it is possible that multiple interruptions would produce attenuated processing and a depressed or even reversed interruption effect on persuasion.

As another alternative account, could it be that need for cognitive closure plays a role? Although we do not contest the notion that interruptions can produce a need for closure (Silvera et al. 2005), it is unlikely that this need underlies the current results. First, a substantial literature suggests that high (vs. low) need for closure reduces elaboration (e.g., Kruglanski 1989; Webster, Richter, and Kruglanski 1996). This is precisely the opposite of what we observed in the current studies. Moreover, our data are inconsistent with this possibility. Indeed, need for cognition and need for closure are negatively correlated (Cacioppo et al. 1996). If the current effects operate by boosting need for closure, we would expect the effect to emerge at low levels of trait (i.e., baseline) need for closure, where there is ample room for need for closure to grow, which would correspond with *higher* levels of need for cognition. This is the opposite of the pattern revealed in study 4.

In general, high (vs. low) need for closure individuals tend to engage in more heuristic (rather than elaborative) processing (Kruglanski, Webster, and Klem 1993). Past research does indicate that high need for closure individuals tend to process more when they do not (vs. do) have a heuristic cue available, but they still process less than all of their low need for closure counterparts (Klein and Webster 2000). In sum, extensive research reveals that high need for closure is associated with less processing than low need for closure. Because we found that momentary interruptions can increase message processing, it appears unlikely that need for closure drives the observed effects.

Nevertheless, we tested this possibility in a separate study. Following the logic of study 4, we predicted that if the interruption effect is driven by increased need for closure, it should be more likely to emerge when baseline levels of need for closure are relatively low (or moderate) and thus have ample room to increase. Conversely, when baseline need for closure levels are relatively high, a need for closure account would suggest that the interruption effect might be less likely to emerge because there is less room for need for closure to grow. To test this possibility, we ran a study in which 80 participants were either interrupted or not while reading strong arguments. Results indicated that interrupted participants reported more favorable attitudes toward the focal topic ($M_{Interruption} = 5.83$, $SD_{Interruption} = 2.47$; $M_{Control} = 4.65$, $SD_{Control} = 2.72$; $t(78) = 2.02$, $p = .046$) and more curiosity about what the interrupted information might say ($M_{Interruption} = 7.05$, $SD_{Interruption} = 1.53$; $M_{Control} = 5.50$, $SD_{Control} = 2.08$; $t(78) = 3.85$, $p < .001$). However, trait Need For Closure (Roets and Van Hiel 2011; $\alpha = .91$) did not moderate these effects, F values $(1, 76) < .62$, p values $> .497$. Thus it is unlikely that need for closure played a key role in our results.

Future Directions

We encourage future research to investigate the conditions under which momentary interruptions decrease persuasion. We observed positive or null effects in our studies (depending on condition), but it seems reasonable to assume that momentary interruptions will sometimes create negative effects. For instance, as noted already, perhaps frequent or numerous interruptions undermine persuasion via their effect on load and arousal. Further, it could be that the valence of the interrupting event plays a role. The interruptions employed in our studies were relatively

neutral in valence (e.g., a request for directions, a brief pause for video loading). What effect would a pleasant or unpleasant interruption have? Pleasant and unpleasant affect can influence message processing, bias thoughts, or even directly shape attitudes in a cue-based fashion (Petty et al. 1993). Thus manipulating the valence of the interruption itself could help expand our understanding of the diverse effects of interruptions on message processing and persuasion.

We also think it would be useful to examine the downstream consequences of interrupted persuasive messages. For instance, it is well documented that elaboration, and even perceived elaboration, can increase attitude strength (e.g., Barden and Petty 2008; Petty, Haugtvedt, and Smith 1995). This effect can occur because as people think more about an object or issue, they activate more working knowledge from memory, realign their thoughts and beliefs to make them consistent, or simply perceive that they have been more thoughtful and infer that their resulting attitude must be more accurate or valid (Barden and Tormala 2014). Linking that research to the current findings (i.e., that interruptions can promote persuasion through increased processing), perhaps interruptions also increase attitude strength. If true, this would be an important insight because strong attitudes are more persistent over time (e.g., Bassili 1996), more resistant to persuasion (Bassili 1996; Eagly and Chaiken 1995; Haugtvedt and Petty 1992; Tormala and Petty 2002), and influence thought and behavior more strongly (e.g., Pomerantz, Chaiken, and Tordesillas 1995; Tormala and Petty 2002).

Also relevant to future research, the current studies revealed that the interruption effect was more likely to emerge when baseline levels of elaboration were relatively low, and less likely to emerge when baseline levels of elaboration were relatively high. However, it is worth noting that we observed this moderation effect in domains of at least moderate curiosity. That is, message recipients were likely at least somewhat curious about our message topics (chocolate truffles, the health benefits of nuts and coffee, drinking-age legislation, and a health cereal). We suspect that in domains in which baseline curiosity tends to be lower for the average person (e.g., esoteric tax laws or electrical wiring), interruptions would be less likely to provoke curiosity and elaboration. Stated differently, it is possible that the interruption effect is most likely to emerge when message recipients' baseline curiosity about a topic is not so low that an interruption fails to heighten it and motivate processing, but also not so high that the recipient processes information deeply regardless of the interruption. Thus there may be a sweet spot, as it were, of a priori curiosity (neither too high nor too low) at which the current interruption effects manifest. Exploring this possibility would be a useful direction for future research to help delineate the conditions under which the interruption effect does and does not occur.

Coda

While little research has examined the consequences of momentary interruptions, significant literature has documented the (often harmful) consequences of other types of interruptions. For example, research examining interruptions resulting from the simultaneous completion of multiple tasks reveals that these types of interruptions produce cognitive load and negative arousal, and consequently undermine processing. Other research has investigated the consequences of interruptions that permanently prevent individuals from returning to a focal task. However, research has not yet investigated the persuasive consequences of a different type of interruption that punctuates daily life—interruptions that temporarily disrupt the receipt of information before enabling the message recipient to return to the interrupted information unencumbered. The current research provides the first insight into this domain, and it suggests that these interruptions can play a powerful role in increasing message processing and persuasion.

DATA COLLECTION INFORMATION

The first author supervised the collection of data for the first and second study by research assistants at Stanford University's Behavioral Lab in the fall of 2013. The first author analyzed these data. The first author managed the collection of data for studies 3–5 using an online pool in 2013–2015. The first author analyzed these data.

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