

The Meaning of Distraction: How Metacognitive Inferences from Distraction Affect Brand  
Attitudes

DANIEL M. ZANE\*

\*Daniel M. Zane is a Ph.D. Candidate at the Fisher College of Business, The Ohio State University, 2100 Neil Avenue, 530 Fisher Hall, Columbus, OH 43210, zane.7@osu.edu. He would like to thank his co-authors Robert W. Smith, and Rebecca Walker Reczek. Robert W. Smith is an Assistant Professor of marketing at the Fisher College of Business, The Ohio State University, 2100 Neil Avenue, 514 Fisher Hall, Columbus, OH 43210, smith.9990@osu.edu. Rebecca Walker Reczek is an Associate Professor of marketing at the Fisher College of Business, The Ohio State University, 2100 Neil Avenue, 538 Fisher Hall, Columbus, OH 43210, reczek.3@osu.edu. This article is based on the first author's doctoral dissertation. The work is supported in part by a grant from the Decision Sciences Collaborative at The Ohio State University. The authors would like to thank Cait Lamberton, Pat West, and Norbert Schwarz for their helpful comments on this research and Adam Smith for technical assistance.

## Abstract

Consumers often encounter advertisements in the background while primarily focused on other stimuli. In this research, we show that the distraction consumers experience from these background ads serves as a metacognitive cue from which inferences are drawn. Across five studies, we demonstrate that when consumers find themselves more distracted than expected by a background advertisement, they draw on an underlying lay theory that distraction implies interest in the contents of the distracting stimulus to make the metacognitive inference that they are interested in the advertised brand. We identify important moderators for this effect, including accessibility and diagnosticity of the distraction = interest lay theory, the extent to which consumers perceive distraction from a focal task to have negative consequences, and an individual's explicit level of belief that distraction implies interest. Thus, this research uncovers a new metacognitive cue that consumers use to form evaluations of brands and explores attitudinal consequences of distraction beyond its impact on performance or memory-related measures. Our work also provides practical insight into how consumers are influenced by advertisements they encounter while primarily focused on a concurrent but unrelated task.

Keywords: lay theories, metacognitive inferences, distraction, background advertisements

Consumers often encounter advertisements in the background while primarily focused on other stimuli. For example, a consumer may listen to the radio while using the Internet to read an article, check social media, or perform a variety of other tasks. In this context, an Internet radio ad is encountered as a background stimulus as the consumer primarily focuses on other stimuli or tasks. Even television ads may be heard as background audio as consumers' mobile devices become focal points of attention; a 2010 Nielsen report indicated that 84% of Americans use a second device while watching television at least occasionally (Nielsen 2010). In this research, we examine how consumers are impacted by background advertisements when their attention is primarily directed toward a task other than the advertisement.

Past research has shown that consumers frequently become more distracted than they expect to be by background stimuli as they try to pay attention to a focal task (Ophir et al. 2009; Sanbonmatsu et al. 2013). We explore whether consumers draw metacognitive inferences when they experience background stimuli to be more distracting than expected (i.e., when the background stimulus draws more attention than expected away from a focal task). We focus on background ads, which we define as advertisements that individuals are exposed to while primarily focused on a concurrent but unrelated task.

Across five studies, we show that when consumers find themselves more distracted than expected by a background advertisement, they draw on an underlying lay theory that distraction implies interest to make the metacognitive inference that they are interested in the advertised brand. We also illustrate five moderators for the effect that unexpected distraction leads to more positive brand attitudes: diagnosticity of the distraction = interest lay theory, accessibility of alternative lay theories, an individual's explicit level of belief in the distraction = interest lay theory, whether distraction from the focal task has negative consequences, and interest in the

product category featured in the background ad. These moderators provide evidence for the proposed metacognitive inferential process and present important boundary conditions.

This research therefore makes several theoretical and practical contributions. We introduce distraction as a new metacognitive experience from which consumers draw inferences, in line with previously established metacognitive cues such as ease-of-recall and information-processing-fluency (Labroo, Dhar, and Schwarz 2008; Lee and Labroo 2004; Schwarz et al. 1991; Wänke, Bohner, and Jurkowitsch 1997; Winkielman et al. 2003). We also add to a large and growing literature about how distraction and interruption affect judgments. However, unlike past work, which focuses on attitudinal reactions toward focal messages and experiences that are driven by processing depth (Isikman et al. 2016; Kupor and Tormala 2015; Petty, Wells, and Brock 1976), our work focuses on attitudinal reactions toward secondary messages that are driven by metacognitive inferences. We also contribute to the literature documenting the influence of lay theories on a variety of consumer behaviors (Broniarczyk and Alba 1994; Deval et al. 2013; Luchs et al. 2010; Labroo and Mukhopadhyay 2009; Mukhopadhyay and Johar 2005; Posavac et al. 2010; Raghunathan, Naylor, and Hoyer 2006; Smith and Schwarz 2016). Finally, our findings provide insight into how background advertisements can shape consumers' opinions of brands, a finding with important practical implications as marketers search for ways to influence consumers who often encounter ads while primarily focused on other stimuli.

## **THE EFFECTS OF NON-FOCAL ADVERTISEMENTS**

While intuition might suggest that an ad that is not the primary focus of a consumer's attention may not influence brand attitudes, prior research has shown that this is not the case. For

example, research on preattentive processing shows that even advertisements which never enter consumers' conscious thoughts can still affect brand evaluations via subconscious processing (Janiszewski 1988, 1990a, 1990b). Mere exposure to an advertisement outside of one's focal visual field can also improve brand evaluations (Janiszewski 1993) or increase the likelihood of a brand's inclusion in a consideration set (Shapiro, MacInnis, and Heckler 1997). Information from an ad that is consciously processed, but done so under low involvement (in that consumers are allocating little attention toward processing the information) can also drive consumer brand attitudes through peripheral cues like attractive visuals or pleasant music (per the Elaboration Likelihood Model; MacInnis and Jaworski 1989; MacInnis, Moorman, and Jaworski 1991; Petty and Cacioppo 1986).

In this research, we focus not on how cues in a non-focal ad can impact brand attitudes, but instead on whether consumers' evaluations of brands in background advertisements are influenced by how distracted by the non-focal ad consumers perceive themselves to be relative to their expectations. As such, we focus on how a background advertisement can affect consumers' judgment of the advertised brand through metacognitive inferences from distraction.

## **DISTRACTION AND METACOGNITIVE INFERENCE-MAKING**

Distraction is a rich topic to study because it can have multiple meanings. Just as there are two types of attention, voluntary and involuntary (Bettman, Luce and Payne 1998; Kahneman 1973), being distracted by a stimulus could mean that one is particularly interested in that stimulus (as in voluntary attention) or that the stimulus is particularly distracting or even annoying (as in involuntary attention). Consumers can interpret their experience of being

distracted in various ways and attach different meanings to their thoughts about being distracted. The inferred meaning of one's mental experiences (i.e., what being distracted by a background ad signals) is referred to as a metacognitive inference.

In simple terms, metacognition refers to individuals' "thoughts about their thoughts or thought processes" (Briñol, Petty, and Tormala 2004; Petty et al. 2007). The broader topic of metacognition includes an investigation of what people infer about the world around them from their cognitive processes ("I'm thinking/experiencing X about an object. What can I infer about an object since I'm thinking/experiencing X in regards to that object?" Schwarz 2015).

Consumers often infer their attitudes toward objects from metacognitive experiences with those objects instead of based solely on relevant accessible knowledge about the objects or directly observable qualities of those objects. For example, consumers infer greater enjoyment of tasks when they perceive time to pass quickly relative to their expectations (Sackett et al. 2010).

The metacognitive inferences that consumers form stem from underlying lay theories that are accessible at the time of evaluation (Schwarz 2004; Schwarz 2015). Lay theories (also known as naïve theories or lay beliefs) reflect people's understanding of the world; they are the common-sense explanations people use to understand their experiences and environment and have been shown to impact a variety of behaviors (Molden and Dweck 2006; Schwarz 2004). For example, the metacognitive inference about enjoyment of tasks based on the perceived speed of time passage is rooted in the common lay theory that "time flies when you're having fun" (Sackett et al. 2010). In other words, consumers mentally acknowledge that time seems to pass unexpectedly quickly while they complete certain tasks and attach meaning to this cognition by accessing a lay theory about the relationship between time and enjoyment.

Individuals are increasingly likely to form metacognitive inferences as their thoughts or experience with a given object deviate more from expectations. As notable examples, consumers' judgments of objects are often influenced by how easy or difficult it is to retrieve information about that object from memory relative to their expectations (Schwarz et al. 1991; Wänke et al. 1997) and how easy or difficult it is to process new information about that object relative to their expectations (Lee and Labroo 2004; Winkielman et al. 2003).

Distraction is an abundant source of violated expectations. Consumers tend to believe that they are able to effectively perform two tasks, or attend to more than one stimulus, simultaneously (Crenshaw 2008; Ophir et al. 2009; Rosen 2008; Sanbonmatsu et al. 2013). In reality, however, consumers are quite prone to being distracted away from a focal task by background stimuli (Crenshaw 2008; Finley, Benjamin, and McCarley 2014; Rosen 2008). This mistaken belief that one can effectively attend to multiple stimuli simultaneously is colloquially referred to as "the myth of multitasking" (Crenshaw 2008; Rosen 2008). Thus, when consumers find their attention moving away from a focal task toward a secondary stimulus, they experience distraction, and this distraction is often unexpected given consumers' beliefs that they can successfully perform more than one action simultaneously (Crenshaw 2008; Ophir et al. 2009; Rosen 2008; Sanbonmatsu et al. 2013). In this research, we propose that this unexpected distraction produces metacognitive inferences.

Specifically, we predict that when consumers are more distracted by a background advertisement than expected, they look to explain the unexpected experience of distraction. In order to do so, they turn to a lay theory about the relationship between distraction and interest in the contents of that distractor, which ultimately results in the formation of metacognitive inferences about their attitude toward the advertised brand. Further, we propose that the

dominant lay theory about distraction is that it implies interest in the contents of the distractor (i.e., that people are distracted by things they find inherently interesting). More formally:

H1: When consumers find themselves more distracted than expected by a background advertisement, they draw on an underlying lay theory that distraction implies interest to make the metacognitive inference that they are interested in the advertised brand.

#### MODERATING THE INFLUENCE OF THE “DISTRACTION = INTEREST” LAY THEORY

*Diagnosticity of the Lay Theory.* Past research has shown that consumers will only make a particular metacognitive inference when the underlying lay theory is both accessible and diagnostic (Feldman and Lynch 1988; Herr, Kardes, and Kim 1991; Menon, Raghurir, and Schwarz 1995). If the diagnosticity of the lay theory is called into question, inferences will change (Schwarz et al. 1991; Sanna and Schwarz 2003). Therefore, if consumers come to believe that distraction is not diagnostic of interest in the contents of the distractor (i.e., if the diagnosticity of the “distraction = interest” lay theory is challenged), they will be unlikely to form and incorporate metacognitive inferences about distraction into their evaluations of the advertised brand. We therefore propose that if consumers are exposed to information that directly challenges the diagnosticity of the distraction = interest lay theory, then unexpected distraction will not yield positive attitudinal consequences.



H2a: The effect in hypothesis 1 will not obtain when the underlying distraction = interest lay theory about the relationship between distraction and interest in the contents of the distractor is not perceived as diagnostic due to information directly challenging its diagnosticity.

In addition to information directly challenging the diagnosticity of the distraction = interest lay theory, perceived diagnosticity of the lay theory may also be undermined in situations where there are negative consequences of being distracted from one's focal task. Although distraction always diverts attentional resources from a focal task (Kahneman 1973; Lynch and Srull 1982; Pashler 1994), this diversion of attention will not necessarily be perceived by consumers as having negative consequences. Specifically, when consumers are not trying to accomplish a specific goal in their focal task, we propose that negative consequences of distraction are not salient, and the distraction = interest lay theory is considered appropriately diagnostic for the context, resulting in metacognitive inferences as hypothesized above. In contrast, when consumers are trying to achieve a specific goal in the focal task, negative consequences of failure to achieve that goal become salient (Heath, Larrick, and Wu 1999; Zhang, Huang, and Broniarczyk 2010). Therefore, we predict that during active goal pursuit, the lay theory that distraction = interest is less diagnostic to the task at hand and is therefore unlikely to be applied, as consumers are now likely to interpret any distraction in relation to achieving (or not achieving) the goal (Jhang and Lynch 2015; Mischel and Masters 1966) instead of using distraction to draw conclusions about their interest in the contents of the distractor. Thus, the distraction = interest lay theory becomes less diagnostic during active goal pursuit due to

consumers' focus on the negative consequences of distraction for goal attainment. We therefore predict the following:

H2b: The effect in hypothesis 1 will not obtain when the underlying distraction = interest lay theory about the relationship between distraction and interest in the contents of the distractor is not perceived as diagnostic due to the negative consequences of distraction for goal attainment.

*Accessibility of the Lay Theory.* Metacognitive experiences (e.g., processing fluency or distraction) often have multiple potentially applicable lay theories that can be brought to bear on a specific experience (Deval et al. 2013; Schwarz 2004; Smith and Schwarz 2012; Winkielman and Schwarz 2001). We suggest that the distraction = interest lay theory is dominant given that throughout one's life, attention is generally correlated with interest. That is, experience and learning have probably taught most people that attention is most often voluntary and driven by interest in an object. However, consumers likely realize that not all attention is voluntary, and that some stimuli are distracting for reasons outside of one's interest in them. Crying babies and intrusive conversations can be incredibly distracting, and consumers likely realize that high distraction is occasionally associated with high annoyance. If this alternative lay theory (i.e., distraction = annoyance) is more accessible at the time of judgment about the meaning of an unexpected distraction, a consumer would not infer interest from distraction, and may even arrive at an opposite conclusion about their interest in the advertised brand. In other words, this consumer may infer that he or she has little interest in the advertised brand because he or she found the ad distracting and associates this distraction with being annoyed. We therefore predict:

H3: Consumers will infer more interest in a brand in a background advertisement when a distraction = interest lay theory is accessible than when a distraction = annoyance lay theory is accessible.

*Individual Differences in Belief in, and Application of, the Lay Theory.* Additionally, while we have proposed that distraction = interest is the dominant lay theory except as noted above, there are likely to be individual differences in the extent to which consumers hold this lay theory. This is because lay theories develop over time through both personal experiences and sociocultural messages (Morris, Menon, and Ames 2001; Ross and Nisbett 1991). Past research has shown that the effects of a given lay theory are generally weaker when consumers do not espouse explicit belief in the lay theory (e.g., Raghunathan et al. 2006). Such a finding is consistent with the metacognitive inference making process we propose. An individual who does not chronically espouse explicit belief in a given lay theory does not perceive that lay theory as diagnostic and will therefore not apply it to draw inferences about their experience of distraction.

Similarly, consumers might not perceive the distraction = interest lay theory to be diagnostic regarding a product category in which they have little interest. If someone who is generally not interested in the product category of automobiles found themselves unexpectedly distracted by an advertisement for a specific car brand, they probably would not assume that they wanted to buy that car. The distraction = interest lay theory would not be enough to overpower the consumer's general lack of interest in cars. In other words, the normally dominant lay theory is non-diagnostic in that particular situation, and the consumer would come to a variety of other

possible conclusions about why they were distracted (e.g., annoyance, the marketer's tactics, etc.). We therefore predict the following:

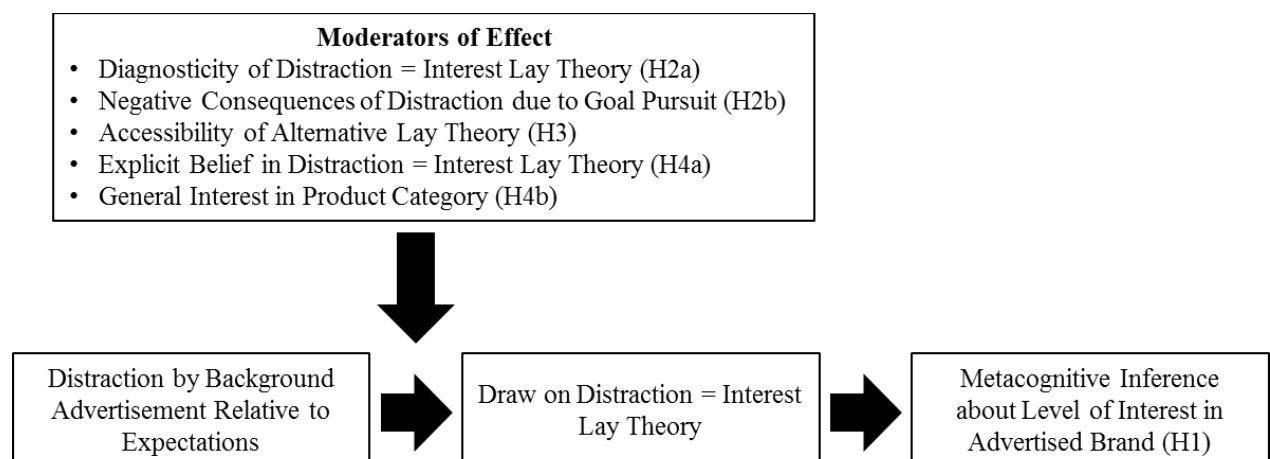
H4a: Individuals who do not express at least moderate levels of agreement with the distraction = interest lay theory will not infer greater interest in a brand advertised in a background ad when more distracted than expected by the ad.

H4b: Individuals who do not express at least moderate levels of interest in the product category to which the advertised product belongs will not infer greater interest in the brand advertised in a background ad when more distracted than expected by the ad.

We test our hypotheses, summarized in figure 1, across five studies.

FIGURE 1

CONCEPTUAL FRAMEWORK



## OVERVIEW OF STUDIES

In study 1, we demonstrate that consumers are more interested in a brand after being unexpectedly distracted by a background ad for that brand. Due to the difficulty of consumers introspecting and self-reporting mediation measures in the metacognitive inferences domain (Haddock et al. 1999; Kupor, Tormala, and Norton 2014; Schwarz 1998; Smith and Schwarz 2012), we provide process-by-moderation evidence (Spencer, Zanna, and Fong 2005) in subsequent studies to demonstrate that this effect is driven by metacognitive inferences. In study 2, we demonstrate that when the diagnosticity of the distraction = interest lay theory is called into question, consumers who are more distracted than expected no longer infer greater interest in the advertised brand. In study 3, we demonstrate that consumers infer more interest in a brand in a background advertisement when the distraction = interest lay theory is accessible than when a distraction = annoyance lay theory is accessible. In study 4, we show that (1) consumers do not make the metacognitive inference that they are interested in the advertised brand when there are negative consequences of being distracted due to the desire to achieve a goal in the focal task and (2) there is natural variation in the extent to which consumers believe the distraction = interest lay theory to be diagnostic and thus rely on it to form metacognitive inferences. In study 5, we show that consumers' general level of interest in the advertised product category determines whether they rely on the distraction = interest lay theory to form metacognitive inferences.

### STUDY 1

The goal of study 1 is to test whether consumers form metacognitive inferences about their level of interest in a brand advertised in a background ad based on their level of distraction toward the ad relative to expectations. Note that we are interested in exploring the attitudinal consequences of feeling unexpectedly distracted by a background advertisement regardless of any specific characteristics of the advertisement itself. In order to achieve this, we hold the background audio advertisement (i.e., the type of ad a consumer would hear on the radio) constant while manipulating whether consumers expect high versus low levels of distraction while simultaneously completing a focal task. As such, all participants listen to the same advertisement, but do so with different expectations of how distracting the ad should be, depending on condition (i.e., they expect to be very distracted or expect not to be very distracted). Consistent with hypothesis 1, participants who are more distracted than expected by a background ad (i.e., those who expect low levels of distraction by an ad, but then experience more distraction than expected) should ultimately come to conclude that they are more interested in the advertised brand.

Additionally, we include a third condition in which we do not manipulate participants' expectations prior to hearing a background advertisement. Because consumers naturally believe they are able to effectively perform two tasks, or attend to more than one stimulus, simultaneously (Crenshaw 2008; Ophir et al. 2009; Rosen 2008; Sanbonmatsu et al. 2013), we predict that participants in this condition will expect a similarly low level of distraction by the background ad as those in the manipulated low expectations of distraction (confirmed in a pretest below). As such, any experienced distraction by participants in this "natural" low expectations of distraction condition should also seem unexpected. Thus, they should be prone to form metacognitive inferences in order to make sense of the unexpected cognitive experience of being

distracted. We therefore predict that participants in this condition will infer a similar level of interest in the advertised brand compared to the condition in which we experimentally manipulate participants to have low expectations of distraction by the background ad.

### Participants and Procedure

A total of 110 undergraduates (46.36% female;  $M_{age} = 21.07$ ) participated in this study for partial course credit. This study used a 3-cell (Expectations of Distraction: manipulated high, manipulated low, or naturally low) between-subjects design. As part of a cover story, all participants were informed that the study involved how secondary tasks affect color preferences. All participants were given crayons and spent five minutes coloring an outlined drawing of a small “main street” district in a quaint town as the focal task while simultaneously listening to a long-form background audio advertisement for the 2016 Mercedes-AMG GT S sports coupe over headphones. After the five minutes passed, participants answered several questions about their experience.

*Expectations of Distraction Manipulation.* Prior to beginning the aforementioned tasks, participants in the manipulated low expectations of distraction condition read that previous research has shown that students are good at tuning out advertisements while focusing on creative tasks and therefore that the audio advertisement should not be very distracting as they focus on coloring. Based on these instructions, participants in this condition should experience any distraction by the ad as unexpected and, consistent with hypothesis 1, should infer greater interest in the advertised brand. Participants in the manipulated high expectations of distraction condition read the opposite—that students are not good at tuning out advertisements while

focusing on creative tasks. Distraction in this condition should align with expectations (i.e., everyone is distracted by the ad and therefore any distraction experienced is “normal”).

Participants in the natural low expectations of distraction condition read nothing about prior research and thus did not have their expectations manipulated in any way. As mentioned above, we predicted that any experienced distraction by participants in the natural low expectations of distraction condition should also seem unexpectedly high given that consumers expect to be good at performing multiple tasks simultaneously, such that results in this condition should be similar to those in the manipulated low expectations of distraction condition.

A pretest with a separate sample of undergraduates from the same population ( $n = 189$ ; 56.61% female;  $M_{age} = 20.68$ ) confirmed that participants in the manipulated low expectations of distraction condition and natural low expectations of distraction condition indeed held equally low expectations of being distracted by the audio ad while coloring and that their expected distraction was significantly less than that of participants in the manipulated high expectations of distraction condition. Participants in the pretest read the same instructions and saw one of the same manipulations, depending on condition, as in the main study. After undergoing their respective manipulation, but before commencing any coloring or listening task, the participants responded to the following measures: “How distracted do you expect to be by the audio advertisement while coloring” (1 = *Not at all distracted*, 7 = *Very distracted*), “My attention will shift towards the advertisement as I try to color” (1 = *This will not happen to me at all*, 7 = *This will happen to me a lot*), and “I will be unable to remain completely focused on coloring” (1 = *Strongly Disagree*, 7 = *Strongly Agree*;  $\alpha = .75$ ). Those in the manipulated low expectations of distraction condition and those in the natural low expectations of distraction condition reported equally low expectations of distraction ( $M_{manipulated\ low\ expectations\ of\ distraction} = 3.34$  vs.  $M_{natural\ low$



*expectations of distraction* = 3.56;  $t(186) = -1.12, ns$ ). Participants in the manipulated high expectations of distraction condition reported significantly higher expectations of distraction ( $M = 4.16$ ) than participants in the manipulated low expectations of distraction condition ( $t(186) = -4.08, p = .0002$ ) and the natural low expectations of distraction condition ( $t(186) = -2.97, p = .01$ ).

*Measures.* When the five-minute ad ended in the main study, participants heard a message in their headphones prompting them to stop coloring and to look back at the computer screen to continue. Participants then indicated their agreement with the following statements about the brand in the audio ad (1 = *Strongly disagree*, 7 = *Strongly agree*): “I am interested in the brand,” “The brand is exciting,” “The brand is unique,” and “I would like to learn more about the brand.” These four items were averaged into a composite ( $\alpha = .81$ ), which served as our dependent variable. Finally, participants provided demographic information and were then informed that the study was over and were instructed to remove their headphones before proceeding to an unrelated task. As it was imperative that participants paid close attention to directions, a research assistant made note of anyone who performed activities other than coloring while listening to the background audio ad. No participants failed this attention check.

## Results

To analyze the between-subjects conditions, we created two orthogonal between-subjects contrasts (table 1) comparing (1) the manipulated low expectations of distraction and natural low expectations of distraction conditions to the manipulated high expectations of distraction condition and (2) the manipulated low expectations of distraction condition to the natural low expectations of distraction condition. We expected to observe greater interest in the advertised

brand in the manipulated low expectations of distraction and natural low expectations of distraction conditions compared to the manipulated high expectations of distraction condition and no difference in interest between the manipulated and natural low expectations of distraction conditions.

Table 1

## Study 1: Orthogonal Between-Subjects Contrast Codes

	Manipulated Low Expectations of Distraction	Manipulated High Expectations of Distraction	Natural Low Expectations of Distraction
<b>Contrast Code 1</b> Manipulated Low Expectations of Distraction and Natural Low Expectations of Distraction versus Manipulated High Expectations of Distraction	1	-2	1
<b>Contrast Code 2</b> Manipulated Low Expectations of Distraction versus Natural Low Expectations of Distraction	1	0	-1

As expected, regression revealed a significant main effect of the first contrast code ( $F(1, 107) = 8.86, p < .01$ ), such that mean brand interest in the manipulated low expectations of distraction ( $M = 5.11$ ) and natural low expectations of distraction conditions ( $M = 5.37$ ) was significantly greater than mean brand interest in the high expectations of distraction condition ( $M = 4.64$ ). There was no significant main effect of the second contrast code ( $F(1, 107) = 1.16, ns$ ); mean brand interest was the same in the manipulated low expectations of distraction condition and the natural low expectations of condition. These results support hypothesis 1.

## Discussion

Study 1 provides initial evidence that consumers infer their level of interest in an advertised brand from their level of distraction relative to expectations caused by a background ad featuring that brand. When participants' level of distraction by a background ad exceeded expectations (i.e., in the manipulated low expectations of distraction and natural low expectations of distraction conditions), they concluded from this relatively high level of distraction that they have relatively high interest in the advertised brand. Note that even if the individuals in the manipulated high expectations of distraction condition are unexpectedly *non-distracted* (i.e., they were told they should be distracted, but find themselves not distracted), they should then infer less interest in the advertised brand, consistent with our theorizing.

Importantly, participants in the natural low expectations of distraction condition reported equal levels of interest compared to those who were manipulated to expect the ad to be minimally distracting. As the pretest confirms, participants naturally expect ads to be minimally distracting, and this ultimately means that metacognitive inferences based on being unexpectedly distracted can occur even when these expectations are not experimentally induced.

## STUDY 2

We next test hypothesis 2a; if the diagnosticity of the underlying lay theory is directly challenged, consumers should be less likely to rely on the lay theory to draw metacognitive inferences about their level of interest in a brand featured in a background ad (Feldman and Lynch 1988). If other processes besides metacognitive inferencing were driving the effect we

observe in study 1, challenging the diagnosticity of the lay theory would not have any effect on interest in the brand. Therefore, testing hypothesis 2a in study 2 allows us to establish causality without relying on self-reports of mediation (Spencer et al. 2005). We also provide evidence in study 2 that the advertisement is indeed seen as the background (vs. focal) stimulus and rule out an alternative explanation for our results. One could argue that differing levels of interest in an advertised brand could vary if actual, stand-alone attention to the ad (independent of any manipulation of expectations) differs across conditions. To address this, we demonstrate that participants' attention to the background ad does not vary across conditions; only participants' level of distraction by the background ad relative to expectations is affected by our manipulations.

### Participants and Procedure

A total of 212 undergraduates (40.10% female;  $M_{age} = 20.84$ ) participated in this study in exchange for partial course credit. This study used a 2 (Expected Distraction: high or low) X 2 (Diagnosticity of Distraction: high or low) between-subjects factorial design. As in study 1, participants colored the same black and white drawing and listened to the long-form audio advertisement for the Mercedes coupe as part of an ostensible study on how secondary tasks affect color preferences. Prior to simultaneously coloring and listening to the background ad, participants underwent the same manipulation as in study 1 to expect relatively high or low levels of distraction. No natural expectations of distraction condition was included in this study. We also manipulated the diagnosticity of the relationship between one's level of distraction and

one's interest in the contents of that distractor (i.e., the diagnosticity of the distraction = interest lay theory) prior to the coloring/audio ad task.

*Diagnosticity of Distraction Manipulation.* To manipulate the diagnosticity of relationship between participants' level of distraction relative to expectations and interest in the brand, those in the low diagnosticity of distraction condition read additional information before beginning to color and listen to the background ad. Specifically, these participants read that past research shows that one's level of distraction by an ad does *not* signal anything about one's interest in the advertised brand, whereas those in the high diagnosticity of distraction condition read nothing about the diagnosticity of distraction.

*Measures.* When the five-minute ad ended, participants heard a message in their headphones prompting them to stop coloring. Participants then indicated their agreement with the same statements about the brand in the audio ad as in study 1 ( $\alpha = .85$ ). Next, they reported what percentage of attention (out of 100% total) they allocated to both coloring the picture and listening to the advertisement. Finally, participants provided demographic information.

## Results

Data from five participants were removed because a research assistant witnessed them doing activities other than coloring while listening to the background audio ad. The same pattern of results holds if these individuals are included in analyses.

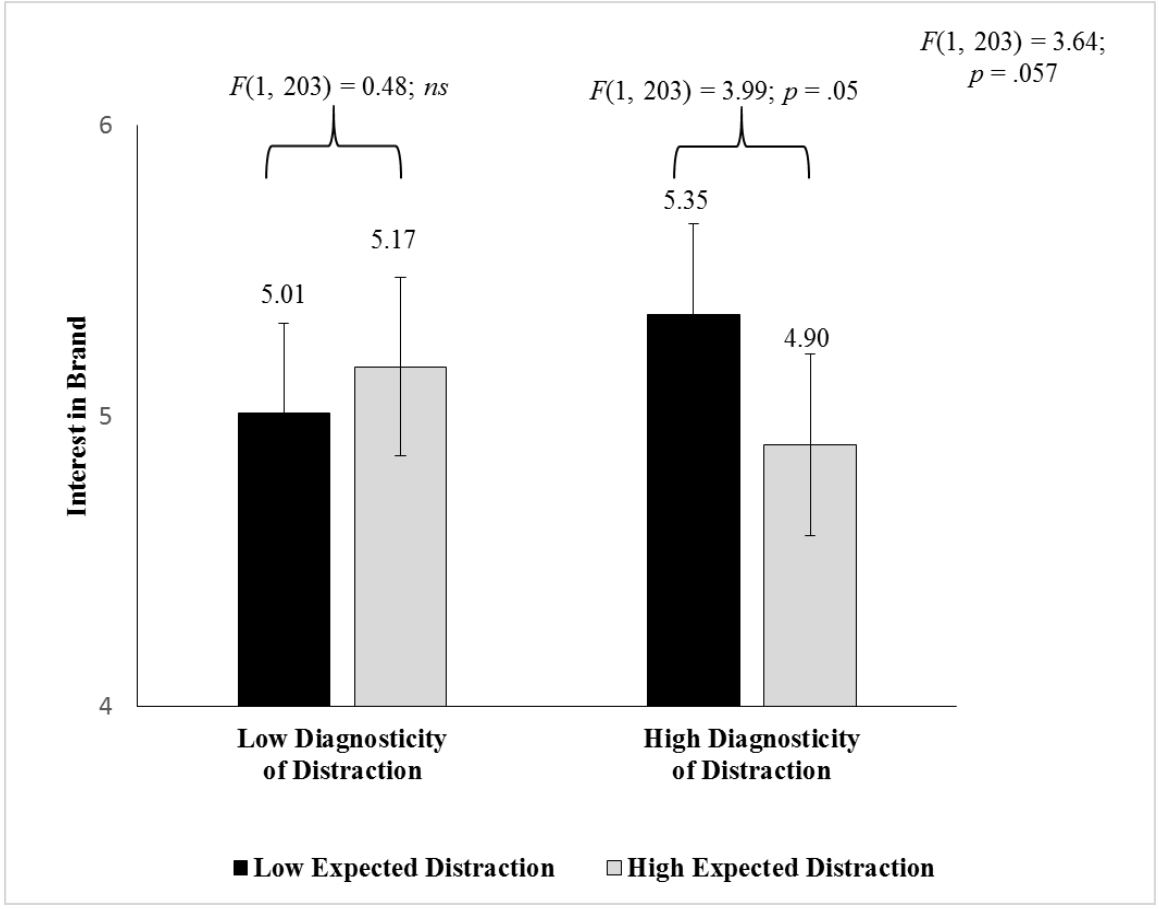
First, we examined the difference in percentage of attention directed toward the focal task and the background ad across all participants. An intercept test using a difference score between these two attention measures revealed that, on average, participants directed significantly more

attention toward the focal task ( $M = 72\%$ ) than toward the background ad ( $M = 34\%$ ;  $F(1, 206) = 267.93, p < .0001$ ). An ANOVA with Expected Distraction, Diagnosticity of Distraction, and their interaction as independent variables and the percentage of attention difference score as the dependent measure showed that the difference in attention given to the focal task versus the background ad was not affected by either manipulated factor or their interaction (all  $ps > .20$ ). This provides support that our experimental design does not manipulate participants' stand-alone level of attention directed toward background ads, but instead only creates differences in experienced distraction relative to expectations as planned.

Next, we conducted an ANOVA with Expected Distraction, Diagnosticity of Distraction, and their interaction as independent variables and the interest in the brand composite as the dependent measure. As expected, an interaction between the two factors emerged ( $F(1, 203) = 3.64, p = .057$ ). Follow-up analyses revealed that there was no significant conditional effect of Expected Distraction on brand interest among participants in the low diagnosticity of distraction condition ( $M_{low\ expected\ distraction} = 5.01$  vs.  $M_{high\ expected\ distraction} = 5.17$ ;  $F(1, 203) = 0.48, ns$  for the simple effect). However, a significant simple effect of Expected Distraction on brand interest did emerge among participants in the high diagnosticity of distraction condition. Specifically, among individuals in the high diagnosticity of distraction condition, those with low expected distraction by the ad reported significantly greater interest in the advertised brand compared to those with high expected distraction by the ad ( $M_{low\ expected\ distraction} = 5.35$  vs.  $M_{high\ expected\ distraction} = 4.90$ ;  $F(1, 203) = 3.99, p = .05$  for the simple effect). As illustrated in figure 2, these results support hypotheses 1 and 2a.

FIGURE 2

STUDY 2: INTERACTION OF EXPECTED DISTRACTION WITH DIAGNOSTICITY OF DISTRACTION ON INTEREST IN THE ADVERTISED BRAND



Note – Bars in graph represent 95% confidence intervals.

Discussion

The findings of study 2 provide evidence that consumers draw on a distraction = interest lay theory in order to make metacognitive inferences about their interest in a brand advertised in a background ad. We establish initial process evidence via moderation (Spencer et al. 2005) by showing that when the diagnosticity of this lay theory is called into question, consumers who are

more distracted than expected no longer infer greater interest in the advertised brand. However, when consumers are in their natural state of believing that this lay theory is diagnostic, they infer greater interest in the advertised brand when the background advertisement is more distracting than initially expected. We also rule out an alternative explanation for these findings, namely that manipulating expected distraction manipulates stand-alone attention to the background ad (irrespective of level of expectations).

One limitation of these first two studies is that they both use an audio ad in conjunction with a visual coloring task. While this is likely a conservative test of our hypotheses because a consumer is less likely to experience auditory interference (i.e., become distracted by the audio advertisement) when the focal task only involves visual processes and does not involve language (Tavassoli and Han 2001), in all subsequent studies, we employ a different focal task that includes language in order to further establish the generalizability of our effects.

### **STUDY 3**

The primary purpose of study 3 is to test hypothesis 3 by exploring whether consumers draw opposing metacognitive inferences about their level of interest in a brand in a background advertisement (i.e., infer either greater interest or less interest), depending on which lay theory (distraction = interest or distraction = annoyance) is accessible at the time of judgment. Because metacognitive inferences depend on the lay theory that consumers bring to bear in a given situation, priming consumers to access competing lay theories should result in opposing (i.e., positive versus negative) metacognitive inferences about their interest in the advertised brand.



Study 3 explores inferences from distraction somewhat differently than the previous studies. Instead of manipulating expected distraction, it relies on the finding from study 1 and the study 1 pretest that expected distraction by background ads is naturally low. We only manipulate which lay theory (distraction = interest or distraction = annoyance) is accessible at the time of judgment. We also include a control condition in which we do not prime either lay theory. Participants in this condition should naturally rely on the distraction = interest lay theory, as the results of our previous studies suggests that this is the dominant lay theory. Study 3 also extends the findings into a more ecologically valid domain—browsing the Internet while listening to an audio advertisement.

#### Participants and Procedure

A total of 413 individuals (48.91% female;  $M_{age} = 35.09$ ) participated in this study on MTurk for payment. This study used a 3-cell (Lay Theory Prime: distraction = interest, distraction = annoyance, or no prime) between-subjects design. Following past research (Cho and Schwarz 2008; Deval et al. 2013), participants in the two conditions in which they were primed with lay theories were told that they would be completing two separate tasks. The first task involved reading a news article and answering some filler questions about it. This task served as the manipulation of participants' lay theories. In the subsequent task, participants were told that they would be completing a study on multitasking behaviors while using the Internet. They then browsed the Internet at their leisure for five minutes while also listening to the long-form audio ad for Mercedes used in studies 1 and 2.

*Lay Theory Accessibility Manipulation.* In the two experimentally manipulated lay theory prime conditions, to manipulate which lay theory about the meaning of distraction was accessible, participants read one of two versions of a mock news article from *Advertising Age* (See appendix A for full articles). Participants in the distraction = interest lay theory prime condition read an article explaining that research shows that advertisements that are interesting and relevant to consumers are likely to attract attention and that advertisers are making full use of this knowledge when designing their ads. This article was intended to prime participants with the lay theory that distraction caused by an ad signals interest in the contents of that ad. Participants in the distraction = annoyance lay theory prime condition read an article explaining that research shows that advertisements that are annoying are likely to attract attention and that advertisers are making full use of this knowledge when designing their ads. This article was intended to prime an alternative lay theory, that is, that distraction caused by an ad signals annoyance with that ad and its contents. After reading their respective article, all participants answered filler questions about the readability and length of the article in keeping with the cover story. In the no prime condition, participants did not read any article and simply began the task of browsing the Internet at their leisure while listening to the ad. As noted above, we expected participants in this condition to naturally rely on the dominant distraction = interest lay theory, as supported by the findings in studies 1 and 2.

*Measures.* When the five-minute ad ended, participants heard a message prompting them to stop browsing the Internet. Participants then indicated their agreement with the same brand interest measures as in studies 1 and 2 ( $\alpha = .89$ ), which served as our dependent variable. Finally, participants provided demographic information and, since this study was conducted online where

research assistants could not physically monitor participants' behavior, reported whether they turned their computer volume off while the ad was playing.

## Results

Data from 17 participants were removed because these participants were exposed to a different condition's manipulation in an initial attempt to complete the study (disrupted due to a technology error) before successfully completing the study on a subsequent attempt. Data from 11 participants were also removed because these individuals admitted to turning their computer volume completely off while the advertisement was playing. The same pattern of results holds if these individuals are included.

To analyze the between-subjects conditions, we created two orthogonal between-subjects contrasts (table 2) comparing (1) the distraction = interest lay theory prime and no lay theory prime conditions to the distraction = annoyance lay theory prime condition and (2) the distraction = interest lay theory prime condition to the no lay theory prime condition. We expected to observe greater interest in the advertised brand in the distraction = interest lay theory prime and no lay theory prime conditions compared to the distraction = annoyance lay theory prime condition and no difference in interest between the distraction = interest lay theory prime and no lay theory prime conditions.

Table 2

Study 3: Orthogonal Between-Subjects Contrast Codes

	Distraction = Interest Lay Theory Prime	Distraction = Annoyance Lay Theory Prime	No Lay Theory Prime
<b>Contrast Code 1</b> Distraction = Interest Lay Theory Prime and No Lay Theory Prime versus Distraction = Annoyance Lay Theory Prime	1	-2	1
<b>Contrast Code 2</b> Distraction = Interest Lay Theory Prime versus No Lay Theory Prime	1	0	-1

As expected, regression revealed a significant main effect of the first contrast code ( $F(1, 381) = 4.04, p = .045$ ), such that mean brand interest in the distraction = interest lay theory prime ( $M = 4.11$ ) and no lay theory prime conditions ( $M = 4.34$ ) was significantly greater than mean brand interest in the distraction = annoyance lay theory prime condition ( $M = 3.91$ ). There was no significant main effect of the second contrast code ( $F(1, 381) = 1.50, ns$ ); mean brand interest was the same in the distraction = interest lay theory prime condition and the no lay theory prime condition. These results support hypotheses 1 and 3.

## Discussion

The results of study 3 further establish process by moderation (Spencer et al. 2005) by showing that consumers' interest in brands advertised in background ads is indeed driven by their metacognitive inferences. When alternative lay theories are accessible, the resulting metacognitive inferences lead to different evaluations of the advertised brand, such that consumers primed with the distraction = annoyance lay theory were less interested in a brand featured in a background ad they experienced as unexpectedly distracting than were participants who had the distraction = interest lay theory more accessible. Although these results demonstrate

that consumer lay theories about the meaning of distraction are malleable, the results pertaining to the no lay theory prime condition in this study, as well as the results of studies 1 and 2, in which neither lay theory was primed, suggest that distraction = interest is the dominant lay theory, as we only obtain results consistent with a distraction = annoyance lay theory in study 3 when this alternative lay theory is made accessible via priming. Finally, study 3 also suggests that our results are generalizable, as they hold with a different focal task. We carry this paradigm into study 4.

#### **STUDY 4**

Study 4 builds on the previous studies by testing two important boundary conditions for the effect that unexpected distraction results in increased interest. First, consistent with hypothesis 2b, we expect that distraction does not imply interest when consumers have a specific goal in the focal task (i.e., when there are negative consequences of distraction) versus when consumers are engaged in a focal task without a specific goal (i.e., when there are no negative consequences of distraction). Second, we also measure participants' explicit belief in the distraction = interest lay theory in order to test hypothesis 4a. Consistent with these hypotheses, we expect that consumers who explicitly believe that distraction signals interest will infer high interest in the advertised brand, but only when there are no negative consequences of distraction. This would manifest as a significant interaction, driven by a significant difference between the two task conditions only among participants who hold the distraction = interest lay theory. Third, we also measure attention to the two tasks to show (1) that the background ad is seen as the

background (vs. focal) stimulus and (2) that stand-alone attention to the ad does not differ across conditions.

### Participants and Procedure

A total of 251 individuals (52.60% female;  $M_{age} = 34.96$ ) participated in this study on MTurk for payment. This study used a 2 (Consequences of Distraction: negative or neutral) between-subjects design. We also captured the extent to which participants hold the distraction = interest lay theory as a measured variable. Participants were told that they would be completing a study on multitasking behaviors while using the Internet. They then performed a task on the Internet (see manipulation below for details) for five minutes while also listening to the long-form audio ad for Mercedes used in previous studies.

*Consequences of Distraction Manipulation.* To manipulate whether there were negative consequences of being distracted by an advertisement, participants either completed a focal task with a clearly defined goal and incentives for completing that goal (in order to ensure that participants actually cared about accomplishing the goal) or a focal task without a goal or incentives, depending on condition. Participants in the condition in which the focal task was associated with a clear goal were expected to recognize negative consequences of distraction. Results of a pretest reported below support that this was indeed the case. Specifically, participants in this condition were asked to answer as many trivia questions (out of 50) as they could in the five minute period while also listening to the advertisement. For each question answered correctly, participants were told they would receive a \$0.03 bonus such that they had a goal of completing as many questions as possible in the limited time allowed in order to

maximize the incentive they could earn. Participants had to provide the correct answer and paste the link to the website on which they found the answer for each question in order to receive credit. Questions were designed so that it would be unlikely for participants to be able to answer based on general knowledge without having to search the Internet (see appendix B for example questions). In contrast, in the neutral consequences of distraction condition, participants browsed the Internet at their leisure for five minutes with no specific goal. No incentives were provided in this condition. Participants were simply asked to visit at least two websites during the five minute period and to paste links to the websites they visited each time they switched sites. In this condition, becoming distracted by the ad should not lead to any significant negative consequences.

A pretest with a separate MTurk sample ( $n = 102$ ; 51.96% female;  $M_{age} = 36.59$ ) confirmed that participants in the condition with a specific goal indeed believed that becoming distracted away from the focal task by the background ad led to more negative consequences than those in the condition without a specific goal. Participants in the pretest completed the same task as those in the main study and answered the following measures after completing the focal task while listening to the background audio ad: “I was negatively affected if the audio advertisement distracted me away from the Internet task,” “It was bad when the audio advertisement distracted me away from the Internet task,” and “My performance on the Internet task was harmed if the audio advertisement distracted me” (1 = *Strongly Disagree*, 7 = *Strongly Agree*;  $\alpha = .91$ ). Those in the negative consequences of distraction condition reported significantly greater agreement with these statements ( $M = 4.69$ ) than those in the neutral consequences of distraction condition (who had no specific goal or incentives;  $M = 2.71$ ;  $F(1, 100) = 35.84, p < .0001$ ).

*Measures.* When the five-minute ad ended, participants in the main study heard a message prompting them to stop searching the Internet and to continue the computer survey. Participants then indicated their agreement with the same four statements as in previous studies about the brand in the audio ad ( $\alpha = .87$ ), which served as our dependent variable. Next, participants indicated how much attention they paid to the two tasks on the same item used in study 2. They then indicated the extent to which they agreed with the following statements on seven-point scales as a measure of the extent to which participants hold the distraction = interest lay theory ( $\alpha = .72$ ,  $M = 4.31$ ): “People are distracted mainly by things that they are interested in,” “People are distracted mainly by things that they are annoyed by” (reversed coded), “If a person’s focus shifts suddenly to something in their environment, it’s probably because they are interested in that thing,” “If a person’s focus shifts suddenly to something in their environment, it’s probably because they are annoyed by that thing” (reverse coded), “If a person is paying attention to something in the background, it’s because it’s something that they want to know more about,” and “If I am really distracted by something, I am probably interested in that thing” (1 = *Strongly Disagree*, 7 = *Strongly Agree*). Finally, participants provided demographic information and reported whether they turned their computer volume off while the ad was playing.

## Results

Data from 10 participants were removed because these participants were exposed to a different condition’s manipulation in an initial attempt to complete the study (disrupted due to a technology error) before successfully completing the study on a subsequent attempt. Data from



four participants were also removed because these individuals either admitted to turning their computer volume completely off while the advertisement was playing or reported not being able to hear the audio advertisement due to technical difficulties. The same pattern of results holds if these individuals are included.

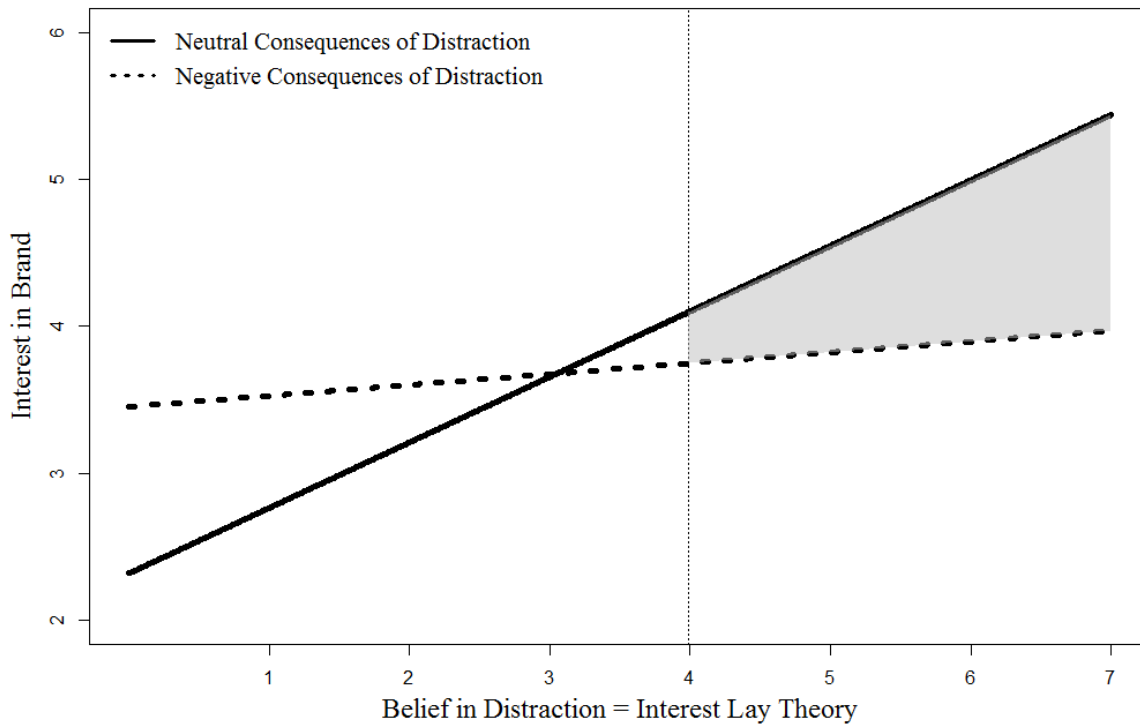
As expected, participants directed significantly more attention toward the focal task ( $M = 77\%$ ) than toward the background ad ( $M = 26\%$ ;  $F(1, 236) = 383.36, p < .0001$ ). A regression with the manipulated Consequences of Distraction factor (neutral consequences of distraction condition = -1, negative consequences of distraction condition = 1), the measured extent to which individuals hold the distraction = interest lay theory (mean-centered), and their interaction as independent variables and the percentage of attention difference score as the dependent measure showed that the difference in attention given to the focal task versus the background ad was not affected by either of these variables or their interaction (all  $ps > .46$ ). One might expect an incentivized task (as in the negative consequences of distraction condition) to garner more attention than a non-incentivized task (as in the neutral consequences of distraction condition). However, as previously noted, while individuals tend to believe that they are able to effectively perform two tasks simultaneously (Crenshaw 2008; Ophir et al. 2009; Rosen 2008; Sanbonmatsu et al. 2013), they are actually quite likely to be distracted away from a focal task by background stimuli regardless of their intentions (Crenshaw 2008; Finley, Benjamin, and McCarley 2014; Rosen 2008). In other words, a similar amount of actual distraction can occur regardless of the nature of the focal task.

Next, we regressed the interest in brand composite on the manipulated Consequences of Distraction factor, the measured extent to which individuals hold the distraction = interest lay theory, and their interaction. As expected, the interaction between these two variables was

significant ( $F(1, 233) = 3.92, p = .049$ ). Floodlight analyses revealed that there was a significant conditional effect of Consequences of Distraction only among participants who had an average score of 3.99 or above on the belief in the lay theory measure (71.31% of participants;  $M = 4.32$ ). Therefore, among participants who hold the distraction = interest lay theory, those in the neutral consequences of distraction condition reported significantly greater interest in the advertised brand than those in the negative consequences of distraction condition, consistent with the results of prior studies. This difference was attenuated among participants who do not hold the distraction = interest lay theory (below 3.99 on the seven-point scale). The trend actually began to reverse, though only directionally, at low levels of belief in the lay theory (below 2.82; 6.33% of participants), such that participants in the neutral consequences of distraction condition reported *less* interest in the advertised brand than those in the negative consequences of distraction condition. Individuals who report low belief in the distraction = interest lay theory likely hold the alternative distraction = annoyance lay theory and draw conclusions about their interest in the brand based on this alternative theory instead, even when there are no negative consequences of being distracted. These results support hypotheses 1, 2b, and 4a and are illustrated in figure 4.

#### FIGURE 4

STUDY 4: FLOODLIGHT ANALYSIS OF INTERACTION OF BELIEF IN DISTRACTION = INTEREST LAY THEORY WITH CONSEQUENCES OF DISTRACTION ON INTEREST IN THE ADVERTISED BRAND



## Discussion

The results of study 4 show that consumers do not infer greater interest in a brand being advertised in a background ad when there are negative consequences of distraction. When a consumer finds himself or herself to be unexpectedly distracted by a background ad while trying to accomplish a specific goal, that individual does not rely on the distraction = interest lay theory to form metacognitive inferences because this lay theory is not perceived as diagnostic when there are negative consequences of distraction. The results of study 4 also show that there is natural variation in the extent to which people believe the distraction = interest lay theory to be diagnostic, and this variation determines whether consumers form a metacognitive inference about being interested in an advertised brand when the ad is more distracting than expected. In

this study, over half of participants reported holding the distraction = interest lay theory, which provides additional evidence, consistent with prior studies, that this is the dominant lay theory.

## STUDY 5

Study 5 replicates the main finding of study 4 by showing that consumers do not form metacognitive inferences about their interest in a brand when distracted by an ad if there are negative consequences of being distracted. More focally, in this study we also measure consumers' general interest in the product category of the brand featured in the background ad (i.e., cars) in order to test hypothesis 4b, that consumers will not find the distraction = interest lay theory diagnostic if they have little interest in the underlying product category. Finally, this study also includes behavioral-intention measures toward the advertised brand in addition to brand attitude measures.

### Participants and Procedure

A total of 250 individuals (50.40% female;  $M_{age} = 34.67$ ) participated in this study on MTurk for payment. We captured participants' general interest in cars as a measured variable, and the order in which this was measured (before or after the main study) was manipulated between-subjects. For the main study, participants were told that they would be completing a study on multitasking behaviors while using the Internet. They then performed the same Internet tasks as in study 4, with or without an incentivized goal, depending on condition. Thus, the study

employed a 2 (Consequences of Distraction: negative or neutral) x 2 (Order of Measuring Interest in Product Category: before or after main study) between-subjects design.

*General Interest in Cars Measure.* As part of an ostensibly separate task, participants indicated their general interest in ten product categories, including the focal category of cars, by answering the following question for each category on a nine-point scale (1 = *Not interested at all*, 9 = *Extremely interested*): “How interested are you, in general, in each of the following product categories?” The categories included cars, cruises, fast food restaurants, smartphones, TVs, laptops, small kitchen appliances, tableware, books, and video games.

*Measures.* When the five-minute ad ended, participants heard a message prompting them to stop searching the Internet. Participants then indicated their agreement with the same four statements as in previous studies about the brand in the audio ad ( $\alpha = .91$ ), which served as our dependent variable. After answering these questions, participants also reported their desire to test drive the advertised Mercedes (1 = *Not at all*, 7 = *Very much*) and their likelihood of renting the advertised Mercedes as a rental car on vacation (1 = *Very unlikely*, 7 = *Very likely*), which were combined into a composite ( $r = .63$ ,  $p < .0001$ ) and served as a measure of participants’ behavioral intentions toward the advertised brand. Finally, participants provided demographic information and reported whether they turned their computer volume off while the ad was playing.

## Results

Data from 11 participants were removed because these participants were exposed to a different condition’s manipulation in an initial attempt to complete the survey (disrupted due to a

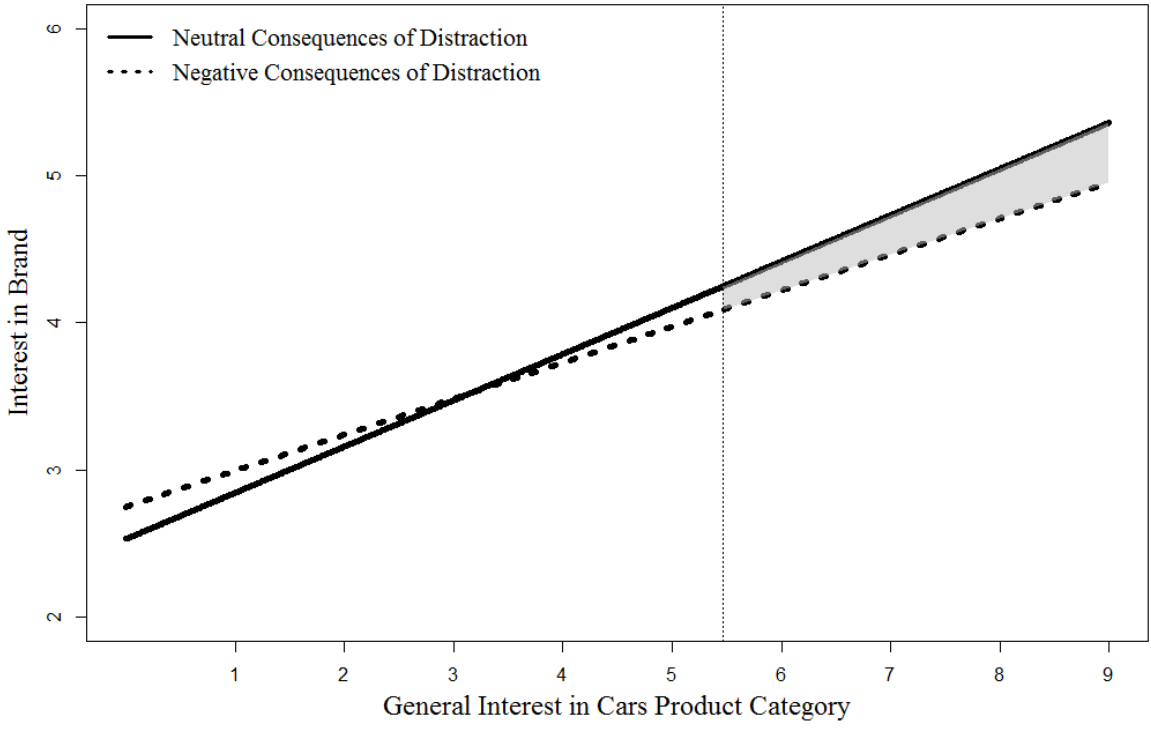
technology error) before successfully completing the survey on a subsequent attempt. Data from seven participants were also removed because these individuals either admitted to turning their computer volume completely off while the advertisement was playing or reported not being able to hear the audio advertisement due to technical difficulties. Results hold if these individuals are included.

*Interest in Brand.* First, we regressed the interest in brand composite on the manipulated Consequences of Distraction factor (neutral consequences of distraction condition = -1, negative consequences of distraction condition = 1), the counterbalanced order variable (interest measure collected first = -1, interest measure collected second = 1), participants' general interest in cars as a measured variable (mean-centered), and all interactions. The order in which participants' interest in cars was measured had no main effect ( $F(1, 224) = 1.41, ns$ ) and did not interact with either the Consequences of Distraction factor ( $F(1, 224) = .08, ns$ ) nor the general interest in cars measure ( $F(1, 224) = 1.20, ns$ ). The three-way interaction was also not significant ( $F(1, 224) = .38, ns$ ). For this reason, the counterbalanced order variable is dropped from all subsequent analyses.

As expected, the interaction between the Consequences of Distraction factor and the general interest in cars measure was significant ( $F(1, 228) = 4.70, p = .03$ ). Floodlight analyses revealed that there was a significant conditional effect of Consequences of Distraction only among participants who had an average score of 5.47 or above on the general interest in cars measure (49.14% of participants;  $M = 5.21$ ). Specifically, among participants who have at least moderate interest in the cars product category, those in the neutral consequences of distraction condition reported significantly greater interest in the advertised brand than those in the negative consequences of distraction condition. This difference was attenuated among participants who

are not interested in the cars product category (below 5.47), suggesting that the lay theory that distraction = interest is non-diagnostic for these participants. As in study 4, the trend actually began to reverse, though only directionally, at low levels of interest in the cars product category (below 3.00; 21.55% of participants), such that participants in the neutral consequences of distraction condition now reported less interest in the advertised brand than those in the negative consequences of distraction condition. These results support hypothesis 1, hypothesis 2b, and hypothesis 4b and are illustrated in figure 5.

FIGURE 5  
STUDY 5: FLOODLIGHT ANALYSIS OF INTERACTION OF GENERAL INTEREST IN CARS PRODUCT CATEGORY WITH CONSEQUENCES OF DISTRACTION ON INTEREST IN THE ADVERTISED BRAND



*Mediating Behavioral Intentions.* Finally, we examined whether participants' interest in the brand in turn affected their behavioral intentions toward the advertised brand (i.e., interest in test driving, interest in renting). We expected that interest in the brand would mediate increased behavioral intentions for participants in the neutral consequences of distraction condition (and not those in the negative consequences of distraction condition), but only when participants had at least moderate interest in the cars product category. Moderated mediation analysis using PROCESS model 7 yielded the expected results (Hayes 2013). The 95% confidence interval for the index of moderated mediation (0.002, 0.127) did not include zero, illustrating that the conditional effect of Consequences of Distraction on behavioral intentions through interest in the brand was significant when participants reported moderate to high levels of general interest in the cars product category, but not significant when participants reported low levels of general interest in the cars product category (Hayes 2015). More specifically, among participants who had an average score of 5.55 or above on the general interest in cars measure (the cutoff from the floodlight analysis), those in the neutral consequences of distraction condition had greater interest in the advertised brand, and this increased interest led to stronger behavioral intentions (at a score of six out of nine on the general interest in cars measure:  $b = 0.18$ ,  $SE = 0.08$ , 95% CI: 0.027, 0.334) compared to those in the negative consequences of distraction condition. In contrast, among participants who had an average score lower than 5.55, there was no difference in interest in the advertised brand across participants in the negative consequences of distraction and neutral consequences of distraction conditions and thus no differences in behavioral intentions (at a score of five out of nine on the general interest in cars measure:  $b = 0.12$ ,  $SE = 0.08$ , 95% CI: -0.035, 0.263).



## Discussion

The results of study 5 provide additional support for the finding in study 4 that consumers do not infer greater interest in a brand in a background ad when there are negative consequences of distraction. Study 5 also provides evidence of an additional moderator of the general effect that inferences from distraction lead to greater interest in brands advertised in background ads: whether consumers have *a priori* general interest in the product category. If the consumer does not, then the distraction = interest lay theory is not perceived as diagnostic in that particular situation (even if it would be applied when the same consumer was distracted by ads for brands from other product categories) and is not used to make metacognitive inferences. In these cases, other lay theories of the meaning of distraction would likely apply. Finally, study 5 also demonstrates that interest in a brand driven by metacognitive inferences from distraction can significantly impact behavioral intentions with respect to the brand.

## GENERAL DISCUSSION

In this research, we explore what consumers infer about a brand when they find themselves unexpectedly distracted by a background ad for it. When consumers find themselves more distracted by a background advertisement than expected, they commonly form metacognitive inferences that they are interested in the advertised brand. Consumers draw on a lay theory that being distracted by a stimulus signals one's interest in the contents of that stimulus to make such inferences. However, we also demonstrate five moderators for the effect that unexpected distraction leads to more positive brand attitudes: diagnosticity of the distraction

= interest lay theory, accessibility of alternative lay theories, an individual's explicit level of belief in the lay theory, whether distraction from the focal task has negative consequences, and general interest in the product category related to the background ad. As such, this research provides a variety of significant theoretical and practical implications about metacognitive inferences from distraction and background advertisements.

### Theoretical Contributions

Our findings illustrate that distraction serves as a metacognitive cue from which consumers form inferences about their evaluations of brands featured in background ads. Our work is thus the first to advance distraction as a new metacognitive experience affecting important consumption variables alongside previously established metacognitive cues, such as ease-of-recall (Schwarz et al. 1991; Wänke et al. 1997), fluency (Labroo et al. 2008; Lee and Labroo, 2004; Winkielman et al. 2003), and perceived passage of time (Sackett et al. 2010).

Our research also adds to a large and growing literature about how distraction and interruption affect judgments. Although past work has explored how distractions can influence judgments of the focal task (Critcher and Gilovich 2010; Damrad-Frye and Laird 1989; Fisher 1998; Isikman et al. 2016; Kupor and Tormala 2015) and how distractions and cognitive load impact processing of focal persuasive messages (Petty et al. 1976), our work is the first, to our knowledge, to examine how distraction by a background stimulus (and away from a focal task) influences attitudes toward the distractor.

Exploring distraction as a determinant of attitudes is especially interesting because dual process models of attitude formation have shown that distraction (i.e., having one's attention

shift back and forth between multiple tasks or stimuli) itself is a factor that leads to attitude formation via peripheral cues (per the Elaboration Likelihood Model; Petty and Cacioppo 1986). Thus, past work has shown that distraction is a factor that creates conditions of low involvement toward an ad, and our work shows that consumers also use this same distraction to form their attitudes via metacognitive inferences. While other metacognitive experiences, such as the ease-of-recall of information about a brand, have been classified as peripheral cues in attitude formation (Greifeneder and Bless 2007; Greifeneder, Bless, and Pham 2010), distraction seems to be unique in that it plays a role both in determining what types of information and cues consumers use to form attitudes, while also serving as one of these cues itself. Our work therefore contributes to our understanding of the multi-faceted role that distraction plays in attitude formation.

Our work also contributes to the literature on consumer lay theories (Broniarczyk and Alba 1994; Deval et al. 2013; Luchs et al. 2010; Labroo and Mukhopadhyay 2009; Mukhopadhyay and Johar 2005; Posavac et al. 2010; Raghunathan et al. 2006; Smith and Schwarz 2016) by showing that consumers hold beliefs about the relationship between distracting stimuli and one's interest in the contents of such distractors. We further show that these beliefs are malleable and demonstrate, consistent with past research on metacognition, that which lay theory is active at the time of evaluation determines the metacognitive inferences that consumers make (Schwarz 2004; Smith and Schwarz 2012; Wegener, Petty, and Dunn 1998; Winkielman and Schwarz 2001). While previous research has shown that consumers make competing inferences about products based on accessible lay theories regarding observable qualities of those products (e.g., price, warranty, etc.; Deval et al. 2013), our findings demonstrate that consumers' inferences about brands can also reverse based on differing

interpretations of their own internal experiences in regards to the brand's advertising, regardless of any qualities of the brand itself. The specific lay theory that consumers use to interpret their internal experiences depends on both individual differences and contextual factors, a finding that warrants careful consideration from marketers, as we will discuss next.

Finally, the inference that attention implies interest may partially explain some previous findings in the marketing literature about attention and choice. The generally accepted notion among marketing practitioners and researchers is that increasing a consumer's attention toward a product increases the likelihood of the consumer choosing that product (Allenby and Ginter 1995; Chandon et al. 2009; Janiszewski, Kuo, and Tavassoli 2013). Although previous research has not delved into the psychological process behind why this might be the case, this relationship may occur in part because consumers infer they are interested in a brand based on their attention directed toward marketing information about it.

### Practical Implications

In today's society, consumers frequently encounter advertisements as background stimuli while they complete other focal tasks (e.g., do household chores, browse the Internet, use their smartphone, etc.). Needless to say, understanding how consumers are affected by their metacognitive experiences with background advertisements should provide marketers with valuable insight when designing future campaigns. Ads must arguably be at least somewhat distracting so that they have the power to capture consumers' attention even when encountered in the background. However, our research shows that the story is more complicated than this. Specifically, our findings suggest that marketers should anticipate the contexts in which

consumers will encounter their ads. If a consumer becomes distracted by a background ad while focusing on completing an important goal, our results suggest that he or she might not react positively toward the advertised brand.

As a concrete example, studies 4 and 5 show that ads are not as effective at increasing interest in the brand when consumers are focused on completing a goal to earn an incentive. Since marketers can track online behavior (Summers, Smith, and Reczek 2016), they should avoid showing distracting ads when consumers are likely focused on being productive and accomplishing goals (e.g., when they are in Google calendar). They should instead aim to show the ads when consumers are browsing entertaining websites (e.g., social media). Marketers can also rely on increasingly sophisticated data tracking on mobile devices (e.g., GPS tracking) to determine when consumers are likely performing focal tasks during which they can be safely presented with a distracting background ad on that device.

Furthermore, Internet radio channels (e.g., Pandora channels) are often marked for fun versus more goal-focused activities like studying. Our results suggest that a premium could potentially be charged to advertise on leisure-focused channels because distracting ads on these channels would likely lead to increased interest in advertised brands compared to study channels due to the metacognitive process we demonstrate. Our results also highlight an interesting dilemma that might arise between “Freemium” business models (e.g., Spotify, Pandora, etc. that offer their base services for free, but then charge money to unlock certain features, such as ad-free music listening) and advertisers who place content on those platforms. The advertisers might not want to annoy consumers with distracting advertisements when consumers are completing time-sensitive or goal-directed tasks. However, the platforms themselves may indeed want

consumers to become annoyed with ads, so that they choose to pay the subscription free to unlock ad-free versions of the platform (Marshall 2013).

### Limitations and Future Directions

Future research can build on these findings in several ways. First, our experiments only measure consumers' interest in a brand at the time the initial metacognitive inference from distraction is made. However, it would be worth exploring how consumers' initial overall conclusions about the brand based on these metacognitive inferences are then integrated into memory and how they in turn affect these individuals' overall attitudes toward the brand and/or inferences about specific attributes of the brand in the future. For example, consumers' interest derived from their initial metacognitive inferences regarding their distraction by an advertisement could then lead them to infer that the brand scored extremely well on a specific attribute in the future (Sanbonmatsu, Kardes, and Sansone 1991). Perhaps this would occur because consumers would forget (or remain unaware) that their original positive attitude stemmed from how distracting an ad is, not from direct information about the brand's specific attributes, similar to a false memory effect (Braun 1999; Rajagopal and Montgomery 2011).

Second, our research shows that distraction is a rich source of metacognitive inference making, but does not fully explore the variety of lay theories that could drive such inferences or all of the antecedents of a consumer experiencing greater than expected distraction. While our findings suggest that consumers tend to rely on the dominant distraction = interest lay theory to infer interest in the brand in the background ad, at times consumers' distraction may also lead them to draw a conclusion about something other than their interest in the brand (e.g., attitudes

toward the focal task, the marketer's tactics, one's available mental resources, etc.). Future work should unpack what other lay theories can be brought to bear on distraction and when individuals form conclusions about their interest in the contents of the distractor versus other factors. Future research could also fruitfully examine the situations in which consumers are most likely to experience more distraction than expected. The modality (e.g., auditory vs. visual) of the primary and secondary tasks may play a role. For example, while we posit that television ads are often encountered as background audio while consumers use second screens, it is likely that consumers' visual attention also shifts toward the TV in certain instances as well. While difficult to test without introducing confounding variables, future work could explore what types of stimuli (e.g., single-channel versus cross-channel distractions) are more likely to lead consumers to become unexpectedly distracted and thus to ultimately form metacognitive inferences. It very well could be that a background stimulus that draws more than one of a consumer's senses toward it (e.g., sight and hearing) leads to more thoughts about being distracted and hence stronger metacognitive inferences. Consumers' degree of attentional control or awareness (Derryberry and Reed 2001; Forster and Lavie 2016) could also influence whether distraction is perceived to be unexpected and thus lead to metacognitive inference making. We leave this and other questions to future research.

## APPENDIX A

## STUDY 3 LAY THEORY PRIME MANIPULATIONS

**Distraction = Interest Lay Theory Prime**

## ADVERTISERS UNDERSTAND THE POWER OF INTEREST

By Jessica Wohl. Published on June 20, 2015

---

According to a recent survey by Advertising Age, advertisers are becoming increasingly focused on making ads that consumers find at least somewhat interesting and relevant.

"We no longer exist in a world where you can throw a totally boring ad at people and expect them to pay attention," said Jeremy Marcum, one of 76 advertising practitioners who took part in the study. "It's increasingly difficult to hold someone's attention, and one way that my colleagues and I achieve this goal is to make advertisements that are as interesting and relevant as possible to our target market."

Indeed, research shows that it's difficult to tune out something that is actually relevant to you, and advertisers are making full use of this knowledge.

Consumers seem to have noticed this trend. The same study also measured 96 consumer responses to advertisements and found that most consumers rate the ads they're exposed to as increasingly interesting.

It seems that part of the reason consumers find today's ads more interesting is because marketers have determined that ads that people find interesting or relevant are great at repeatedly capturing people's attention.

*Research shows that it's difficult to tune out something that is actually relevant to you, and advertisers are making full use of this knowledge.*

**AdvertisingAge.**



**Distraction = Annoyance Lay Theory Prime**

## ADVERTISERS UNDERSTAND THE POWER OF ANNOYANCE

By Jessica Wohl. Published on June 20, 2015

---

According to a recent survey by Advertising Age, advertisers are becoming increasingly focused on making ads that consumers find at least somewhat annoying.

“We no longer exist in a world where you can throw a totally boring ad at people and expect them to pay attention,” said Jeremy Marcum, one of 76 advertising practitioners who took part in the study. “It’s increasingly difficult to hold someone’s attention, and one way that my colleagues and I achieve this goal is to make advertisements that capture people’s attention by annoying them.”

Simply put, research shows that it’s difficult to tune out something that is annoying to you, and advertisers are making full use of this knowledge.

Consumers seem to have noticed this trend. The same study also measured 96 consumer responses to advertisements and found that most consumers rate the ads they’re exposed to as increasingly obnoxious.

It seems that part of the reason consumers find today’s ads more annoying is because marketers have determined that ads that people find annoying are great at repeatedly capturing people’s attention.

*Research shows that it’s difficult to tune out something that is annoying to you, and advertisers are making full use of this knowledge.*

**AdvertisingAge.**

**APPENDIX B****SAMPLE TRIVIA QUESTIONS, STUDIES 4 AND 5**

Who is the only volleyball player to win gold medals in both indoor and beach volleyball at the Olympics?

What's the southernmost province of the largest country of the Iberian Peninsula?

What was the capital of the Aztec Empire in 1340 AD?

The inventor of the periodic table has an element named after him. That element's symbol matches a state's postal abbreviation. What's the capital of that state?

One of the most famous photos of the 20th century was taken at a memorial service for victims of La Coubre. On the original print, what's stamped in the lower left corner?

How long is the river bordering the two countries that once were home to the Hamangia?

Which phylum of the gymnosperms includes only a single living species?

Which four cities in England have underground railroad systems?

In what book was the "equals" sign (=) first used?

What name was a computer mouse originally referred to as?

## REFERENCES

- Allenby, Greg M. and James L. Ginter (1995), "The Effects of In-store Displays and Feature Advertising on Consideration Sets," *International Journal of Research in Marketing*, 12 (May), 67–80.
- Bettman, James R., Mary Frances Luce, and John W. Payne (1998), "Constructive Consumer Choice Processes," *Journal of Consumer Research*, 25 (December), 187-217.
- Braun, Kathryn A. (1999), "Post-Experience Advertising Effects on Consumer Memory," *Journal of Consumer Research*, 25 (March), 319-334.
- Briñol, Pablo, Richard E. Petty, and Zakary L. Tormala (2004), "Self-Validation of Cognitive Responses to Advertisements," *Journal of Consumer Research*, 30 (March), 559-73.
- Broniarczyk, Susan M. and Joseph W. Alba (1994), "The Role of Consumers' Intuitions in Inference Making," *Journal of Consumer Research*, 21 (December), 393-407.
- Chandon, Pierre, J., Wesley Hutchinson, Eric T. Bradlow, and Scott H. Young (2009), "Does In-Store Marketing Work? Effects of the Number and Position of Shelf Facings on Brand Attention and Evaluation at the Point of Purchase," *Journal of Marketing*, 73 (November), 1-17.
- Cho, Hyejeung and Norbert Schwarz (2008), "Of Great Art and Untalented Artists: Effort Information and the Flexible Construction of Judgmental Heuristics," *Journal of Consumer Psychology*, 18 (July), 205-11.
- Crenshaw, Dave (2008), *The Myth of Multitasking: How "Doing it All" Gets Nothing Done*, San Francisco, CA: John Wiley & Sons.
- Critcher, Clayton R. and Thomas Gilovich (2010), "Inferring Attitudes from Mindwandering," *Personality and Social Psychology Bulletin*, 36 (September), 1255-266.
- Damrad-Frye, Robin and James D. Laird (1989), "The Experience of Boredom: The Role of the Self-Perception of Attention," *Journal of Personality and Social Psychology*, 57 (August), 315-20.
- Derryberry, Douglas and Majorie A. Reed (2001) "A Multidisciplinary Perspective on Attentional Control," in *Attraction, Distraction, and Action: Multiple Perspectives on Attentional Capture*, ed. Charles Folk and Bradley Gibson, Amsterdam: Elsevier, 325–47.
- Deval, H el ene, Susan P. Mantel, Frank R. Kardes, and Steven S. Posavac (2013), "How Naive Theories Drive Opposing Inferences from the Same Information," *Journal of Consumer Research*, 39 (April), 1185-201.

- Feldman, Jack M. and John G. Lynch (1988), "Self-Generated Validity and Other Effects of Measurement on Belief, Attitude, Intention, and Behavior," *Journal of Applied Psychology*, 73 (August), 421-35.
- Finley, Jason R., Aaron S. Benjamin, and Jason S. McCarley (2014), "Metacognition of Multitasking: How Well do We Predict the Costs of Divided Attention?," *Journal of Experimental Psychology: Applied*, 20 (June), 158-65.
- Fisher, Cynthia D. (1998), "Effects of External and Internal Interruptions on Boredom at Work: Two Studies," *Journal of Organizational Behavior*, 19 (September), 503-22.
- Forster, Sophie and Nilli Lavie (2016), "Establishing the Attention-Distractibility Trait," *Psychological Science*, 27 (February), 203-12.
- Greifeneder, Rainer and Herbert Bless (2007), "Relying on Accessible Content Versus Accessibility Experiences: The Case of Processing Capacity," *Social Cognition*, 25 (December), 853-81.
- Greifeneder, Rainer, Herbert Bless, and Michel Tuan Pham (2011), "When Do People Rely on Affective and Cognitive Feelings in Judgment? A Review," *Personality and Social Psychology Review*, 15 (May), 107-41.
- Haddock, Geoffrey, Alexander J. Rothman, Rolf Reber, and Norbert Schwarz (1999), "Forming Judgments of Attitude Certainty, Intensity, and Importance: The Role of Subjective Experiences," *Personality and Social Psychology Bulletin*, 25 (July), 771-82.
- Hayes, Andrew F. (2013), *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-based Approach*, New York, NY: Guilford Press.
- Hayes, Andrew F. (2015), "An Index and Test of Linear Moderated Mediation," *Multivariate Behavioral Research*, 50 (February), 1-22.
- Heath, Chip, Richard P. Larrick, and George Wu (1999), "Goals as Reference Points," *Cognitive Psychology*, 38 (February), 79-109.
- Herr, Paul M., Frank R. Kardes, and John Kim (1991), "Effects of Word-of-Mouth and Product-Attribute Information on Persuasion: An Accessibility-Diagnosticity Perspective," *Journal of Consumer Research*, 17 (March), 454-62.
- Isikman, Elif, Deborah J. MacInnis, Gulden Ulkumen, and Lisa Cavanaugh (2016), "The Effects of Curiosity-Evoking Events on Activity Enjoyment," *Journal of Experimental Psychology: Applied*, 22 (September), 319-30.
- Janiszewski, Chris (1988), "Preconscious Processing Effects: The Independence of Attitude Formation and Conscious Thought," *Journal of Consumer Research*, 15 (September), 199-209.

- Janiszewski, Chris (1990a), "The Influence of Nonattended Material on the Processing of Advertising Claims," *Journal of Marketing Research*, 27 (August), 263-78.
- Janiszewski, Chris (1990b), "The Influence of Print Advertisement Organization on Affect toward a Brand Name," *Journal of Consumer Research*, 17 (June), 53-65.
- Janiszewski, Chris (1993), "Preattentive Mere Exposure Effects," *Journal of Consumer Research*, 20 (December), 376-92.
- Janiszewski, Chris, Andrew Kuo, and Nader T. Tavassoli (2013), "The Influence of Selective Attention and Inattention to Products on Subsequent Choice," *Journal of Consumer Research*, 39 (April), 1258-274.
- Jhang, Ji Hoon and John G. Lynch, "Pardon the Interruption: Goal Proximity, Perceived Spare Time, and Impatience," *Journal of Consumer Research*, 41 (February), 1267-283.
- Kahneman, Daniel (1973), *Attention and Effort*, Englewood Cliffs, NJ: Prentice-Hall.
- Kupor, Daniella M. and Zakary L. Tormala (2015), "Persuasion, Interrupted: The Effect of Momentary Interruptions on Message Processing and Persuasion," *Journal of Consumer Research*, 42 (August), 300-15.
- Kupor, Daniella M., Zakary L. Tormala, and Michael I. Norton (2014), "The Allure of Unknown Outcomes: Exploring the Role of Uncertainty in the Preference for Potential," *Journal of Experimental Social Psychology*, 55 (November), 210-16.
- Labroo, Aparna A. and Anirban Mukhopadhyay (2009), "Lay Theories of Emotion Transience and the Search for Happiness: A Fresh Perspective on Affect Regulation," *Journal of Consumer Research*, 36 (August), 242-54.
- Labroo, Aparna A., Ravi Dhar, and Norbert Schwarz (2008), "Of Frog Wines and Frowning Watches: Semantic Priming, Perceptual Fluency, and Brand Evaluation," *Journal of Consumer Research*, 34 (April), 819-31.
- Lee, Angela Y., and Aparna A. Labroo (2004), "The Effect of Conceptual and Perceptual Fluency on Brand Evaluation," *Journal of Marketing Research*, 41 (May), 151-65.
- Luchs, Michael, Rebecca Walker Naylor, Julie R. Irwin, and Rajagopal Raghunathan (2010), "The Sustainability Liability: Potential Negative Effects of Ethicality on Product Preference," *Journal of Marketing*, 74 (September), 18-31.
- Lynch, John G. and Thomas K. Srull (1982), Memory and Attentional Factors in Consumer Choice: Concepts and Research Methods, *Journal of Consumer Research*, 9 (June), 18-37.

- MacInnis, Deborah J. and Bernard J. Jaworski (1989), "Information Processing from Advertisements: Toward an Integrative Framework," *Journal of Marketing*, 53 (October), 1-23.
- MacInnis, Deborah J., Christine Moorman, and Bernard J. Jaworski (1991), "Enhancing and Measuring Consumers' Motivation, Opportunity, and Ability to Process Brand Information from Ads," *Journal of Marketing* 55 (October), 32-53.
- Marshall, Jack (2013), "Introducing the Annoying-Ads Revenue Model," <http://www.digiday.com/publishers/the-annoying-ad-revenue-model/>.
- Menon, Geeta, Priya Raghurir, and Norbert Schwarz (1995), "Behavioral Frequency Judgments: An Accessibility-Diagnosticity Framework," *Journal of Consumer Research*, 22 (September), 212-28.
- Mischel, Walter and John C. Masters (1966), "Effects of Probability of Reward Attainment on Responses to Frustration," *Journal of Personality and Social Psychology*, 3 (April), 390-96.
- Molden, Daniel C. and Carol S. Dweck (2006), "Finding "Meaning" in Psychology: A Lay Theories Approach to Self-Regulation, Social Perception, and Social Development," *American Psychologist*, 61 (April), 192-203.
- Morris, Michael W., Tanya Menon, and Daniel R. Ames (2001), "Culturally Conferred Conceptions of Agency: A Key to Social Perception of Persons, Groups, and Other Actors," *Personality and Social Psychology Review* 5 (May), 169-82.
- Mukhopadhyay, Anirban and Gita Venkataramani Johar (2005), "Where There is a Will, Is There a Way? Effects of Lay Theories of Self-Control on Setting and Keeping Resolutions," *Journal of Consumer Research*. 31 (March), 779-86.
- Nielsen (2010), "The U.S. Digital Consumer," <http://www.nielsen.com/us/en/insights/reports/2014/the-us-digital-consumer-report.html>.
- Ophir, Eyal, Clifford Nass, Anthony D. Wagner, and Michael I. Posner (2009), "Cognitive Control in Media Multitaskers," *Proceedings of the National Academy of Sciences*, 106 (September), 15583-5587.
- Pashler, Harold (1994), "Dual-Task Interference in Simple Tasks: Data and Theory," *Psychological Bulletin*, 116 (September), 220-44.
- Petty, Richard E. and John T. Cacioppo (1986), "The Elaboration Likelihood Model of Persuasion," in *Advances in Experimental Social Psychology*, Vol. 19, ed. Leonard Berkowitz, New York: Academic Press, 1-24.

- Petty, Richard E., Pablo Briñol, Zakary L. Tormala, and Duane T. Wegener (2007), "The Role of Metacognition in Social Judgment," in *Social Psychology: Handbook of Basic Principles*, ed. Arie W. Kruglanski and E. Tory Higgins, New York: Cambridge, 254-84.
- Petty, Richard E., Gary L. Wells, and Timothy C. Brock (1976), "Distraction can Enhance or Reduce Yielding to Propaganda: Thought Disruption versus Effort Justification," *Journal of Personality and Social Psychology*, 34 (November), 874-84.
- Posavac, Steven S., Michal Herzstein, Frank R. Kardes, and Suresh Sundaram (2010), "Profits and Halos: The Role of Firm Profitability Information in Consumer Inference," *Journal of Consumer Psychology*, 20 (July), 327-37.
- Raghunathan, Rajagopal, Rebecca Walker Naylor, and Wayne D. Hoyer (2006), "The Unhealthy = Tasty Intuition and Its Effects on Taste Inferences, Enjoyment, and Choice of Food Products," *Journal of Marketing*, 70 (October), 170-84.
- Rajagopal, Priyali and Nicole Votolato Montgomery (2011), "I Imagine, I Experience, I Like: The False Experience Effect," *Journal of Consumer Research*, 38 (October), 578-594.
- Rosen, Christine (2008), "The Myth of Multitasking," *The New Atlantis*, 20 (Spring), 105-10.
- Ross, Lee and Nisbett, Richard. E. (1991). *The Person and the Situation: Perspectives of Social Psychology*. New York: McGraw-Hill.
- Sackett, Aaron M., Tom Meyvis, Leif D. Nelson, Benjamin A. Converse, and Anna L. Sackett (2010), "You're Having Fun when Time Flies: The Hedonic Consequences of Subjective Time Progression," *Psychological Science*, 21 (January), 111-17.
- Sanbonmatsu, David M., Frank R. Kardes, and Carol Sansone (1991), "Remembering Less and Inferring More: Effects of Time of Judgment on Inferences about Unknown Attributes," *Journal of Personality and Social Psychology*, 61 (October), 546-54.
- Sanbonmatsu, David M., David L. Strayer, Nathan Medeiros-Ward, and Jason M. Watson (2013), "Who Multi-Tasks and Why? Multi-Tasking Ability, Perceived Multi-Tasking Ability, Impulsivity, and Sensation Seeking," *PloS one*, 8 (1), e54402.
- Sanna, Lawrence J. and Norbert Schwarz (2003), "Debiasing the Hindsight Bias: The Role of Accessibility Experiences and (Mis) Attributions," *Journal of Experimental Social Psychology*, 39 (May), 287-95.
- Schwarz, Norbert (1998), "Accessible Content and Accessibility Experiences: The Interplay of Declarative and Experiential Information in Judgment," *Personality and Social Psychology Review*, 2 (May), 87-99.
- Schwarz, Norbert (2004), "Metacognitive Experiences in Consumer Judgment and Decision Making," *Journal of Consumer Psychology*, 14 (4), 332-48.

- Schwarz, Norbert (2015), "Metacognition," in *APA Handbook of Personality and Social Psychology: Attitudes and Social Cognition*, Vol 1, ed. Eugene Borgida and John A. Bargh, Washington, DC: APA, 203-29.
- Schwarz, Norbert, Herbert Bless, Fritz Strack, Gisela Klumpp, Helga Rittenauer-Schatka, and Annette Simons (1991), "Ease of Retrieval as Information: Another Look at the Availability Heuristic," *Journal of Personality and Social Psychology*, 61 (August), 195-202.
- Shapiro, Stewart and H. Shanker Krishnan (2001), "Memory-Based Measures for Assessing Advertising Effects: A Comparison of Explicit and Implicit Memory Effects," *Journal of Advertising*, 30 (3), 1-13.
- Shapiro, Stewart, Deborah J. MacInnis, and Susan E. Heckler (1997), "The Effects of Incidental Ad Exposure on the Formation of Consideration Sets," *Journal of Consumer Research*, 24 (June), 94-104.
- Smith, Robert W. and Norbert Schwarz (2012), "When Promoting a Charity Can Hurt Charitable Giving: A Metacognitive Analysis," *Journal of Consumer Psychology*, 22 (October), 558-64.
- Smith, Robert W. and Norbert Schwarz (2016), "Metacognitive Inferences from Other People's Memory Performance," *Journal of Experimental Psychology: Applied*. Forthcoming.
- Spencer, Steven J., Mark P. Zanna, and Geoffrey T. Fong (2005), "Establishing a Causal Chain: Why Experiments are Often More Effective than Mediational Analyses in Examining Psychological Processes," *Journal of Personality and Social Psychology*, 89 (December), 845-51.
- Summers, Christopher A., Robert W. Smith, and Rebecca Walker Reczek (2016) "An Audience of One: Behaviorally Targeted Ads as Implied Social Labels" *Journal of Consumer Research*, 43 (June), 156-78.
- Tavassoli, Nader T., and Jin K. Han (2001), "Scripted Thought: Processing Korean Hancha and Hangul in a Multimedia Context," *Journal of Consumer Research*, 28 (December), 482-93.
- Wänke, Michaela, Gerd Bohner, and Andreas Jurkowitsch (1997), "There are Many Reasons to Drive a BMW: Does Imagined Ease of Argument Generation Influence Attitudes?," *Journal of Consumer Research*, 24 (September), 170-78.
- Wegener, Duane T., Richard E. Petty, and Meghan Dunn (1998), "The Metacognition of Bias Correction: Naïve Theories of Bias and the Flexible Correction Model," in *Metacognition: Cognitive and Social Dimensions*, ed. Vincent Y. Yzerbyt, Guy Lories, and Benoit Dardenne, London: Sage, 202-27.



- Winkielman, Piotr and Norbert Schwarz (2001), “How Pleasant was Your Childhood? Beliefs about Memory Shape Inferences from Experienced Difficulty of Recall, *Psychological Science*, 12 (March), 176-79.
- Winkielman, Piotr, Norbert Schwarz, Tetra Fazendeiro, and Rolf Reber (2003), “The Hedonic Marking of Processing Fluency: Implications for Evaluative Judgment,” in *The Psychology of Evaluation: Affective Processes in Cognition and Emotion*, ed. Jochen Musch and Karl C. Klauer, Mahwah, NJ: Lawrence Erlbaum Associates, 189–217.
- Zhang, Ying, Szu-chi Huang, and Susan M. Broniarczyk (2010) “Counteractive Construal in Consumer Goal Pursuit,” *Journal of Consumer Research*, 37 (June), 129-42.