A Non-Elaborative Path to Attitude Confidence: Attitude Certainty via Actual and Perceived Accessibility

Dissertation

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Abstract

Two studies are reported examining a mechanism through which attitude accessibility can affect attitude certainty and behavior. It is proposed that when a manipulation affects attitude accessibility, people will be aware of the new ease/speed with which their attitude comes to mind and use this judgment as input to an inference of how confident they are in their attitude. This certainty would then lead to attitude strength consequences. Across two studies, incorporating different manipulations of accessibility and attitude objects, the collected data fit the proposed model well. Perceived ease mediated the relationship between manipulated accessibility and certainty and accessibility and ease, together, mediated the relationship between the accessibility manipulation and certainty. Furthermore, Study 2 provided evidence that certainty created via the proposed accessibility mechanism is consequential for participants’ behavioral intentions. Study 2 also demonstrated that certainty can be inferred from accessibility and elaboration simultaneously through two distinct mechanisms. Several alternative explanations were also addressed.
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Chapter 1: Introduction

Attitude strength has become an increasingly important concept in the persuasion literature as attitudinal valence alone has been shown, at times, to be a poor predictor of the durability and impactfulness of an attitude (LaPiere, 1934; Wicker, 1969). Although two people can hold equally positive attitudes toward an object or issue, these attitudes can vary in their strength so that one person might be more likely to act in accordance with that attitude, maintain that attitude when presented with a persuasive message, hold that attitude across time, and process attitude-relevant information in a biased fashion. Determining what variables lead to these defining attitude strength consequences (Krosnick & Petty, 1995) has been a focus of researchers in psychology, marketing, communications, and political science for decades. Across varying perspectives and studies, a number of indicators of attitude strength have been proposed including attitude accessibility, certainty, importance, extremity, affective intensity, interest, knowledge, affective-cognitive consistency, direct behavioral experience, ambivalence, and latitudes of rejection and non-commitment (see Petty & Krosnick, 1995, for a review).

Researchers have attempted to apply order to this myriad of variables by determining an underlying factor structure (Abelson, 1988; Bassili, 1996; Krosnick, Boninger, Chuang, Berent, & Carnot, 1993;). The conclusion of this research is that although many indicators of attitude strength are correlated with each other, they should be treated as independent constructs and determinants of attitude strength consequences.
(see Visser, Bizer, & Krosnick, 2006, for a review). Of the wide range of variables associated with attitude strength consequences, attitude accessibility and certainty have emerged as two of the most important and studied indicators of attitude strength. Both have extensive research histories demonstrating their role in moderating the effect of an attitude on behavior, cognition, persistence, and resistance. Accessibility and certainty are described next along with their consequences for attitude strength.

An attitude has been defined as an association in memory between an object and an evaluation of that object and attitude accessibility as the speed with which the evaluation comes to mind when presented with the attitude object (Fazio, 1995). Thus, accessibility is typically operationalized as the latency in response to an attitudinal query (Fazio, 1995). When deciding for whom to vote, what candy bar to buy, or where to go on vacation, a readily available attitude can be integral in shaping the outcome of that decision.

In one illustrative study, Fazio and Williams (1986) measured attitudes toward candidates in the 1984 presidential election as well as the accessibility of those attitudes and found that participants with highly accessible attitudes were more likely to believe their favored candidate had “won” the debates and were more likely to vote for their favored candidate than were those with less accessible attitudes. Both of these outcomes were attributed to the relatively accessible attitude coming to mind and biasing perceptions of the candidates and their messages. In addition to having an impact on behavior and cognition, highly accessible attitudes have also been shown to be more resistant to persuasion (Bassili, 1996; Bassili & Fletcher, 1991) and more stable (Bassili, 1996; Huckfeldt & Sprague, 2000) than less accessible attitudes.
**Attitude certainty** is defined as the subjective belief that one’s evaluation of an object or issue is correct (Gross, Holtz, & Miller, 1995). Certainty is the most extensively researched metacognitive indicator of attitude strength and is usually assessed by measuring self-reported confidence, certainty, or surety in one’s attitude (see Tormala & Rucker, 2007, for a review). People are often motivated to make accurate, socially desirable decisions (Festinger, 1954), and in doing so a consideration of the correctness of the underlying attitude is helpful (Ajzen & Fishbein, 1972; Petty & Cacioppo, 1986). A confidently held attitude has been shown to lead to greater attitude-behavior correspondence (Barden & Petty, 2008; Fazio & Zanna, 1978; Glasman & Albarracin, 2006; Sample & Warland, 1973), bias in cognition (Edwards, 2003; Tiedens & Linton, 2001), resistance to active persuasion attempts (Bassili, 1996; Clarkson, Tormala, & Rucker, 2008; Tormala & Petty, 2002) and persistence across time (Bassili, 1996).

Despite the centrality of the accessibility and certainty constructs in attitude strength research and previous calls to examine the causal relations among various indicators of attitude strength (Krosnick et al., 1993), surprisingly little is known about their interrelationships. The goal of the current research is to address the connection between two of the key indicators of attitude strength and to test a causal model of their relationship.

**The Proposed Accessibility Model**

The model in Figure 1 proposes a causal mechanism for the impact of accessibility on attitude certainty. Specifically, the model begins with various antecedent conditions that produce either a short or long-term change in the accessibility of an attitude (relationship A-B). It is also proposed that people can sometimes accurately
perceive and derive a judgment about how accessible their attitude is or how easily it comes to mind (relationship B-C) and that this judgment is used as input to an inference about how much confidence one should have in the validity of the attitude (relationship C-D). Finally, it is proposed that certainty inferred via this mechanism will demonstrate attitude strength consequences commonly associated with attitude certainty (relationship D-E). Prior evidence for each of these relationships and the model as a whole is presented next.

Evidence for Relationships in the Accessibility Model

That a relationship exists between accessibility and certainty is suggested by anecdotal, correlational, and experimental evidence. First, there are lay theories built into our language about certainty being derived with little thought. The concept of epiphany, for example, is defined as “a sudden, intuitive perception of or insight into the reality or essential meaning of something” (epiphany, n.d.). Intuition is similarly defined as “direct perception of truth, fact, etc., independent of any reasoning process” (intuition, n.d.). Both of these definitions refer to a person arriving at a judgment believed to represent reality (i.e., with great certainty) with little or no precursory thought. That is, an accurate judgment just pops into one’s head.

Correlational evidence has also been found for a link between accessibility and attitude certainty. Though Krosnick and colleagues (1993) did not find a reliable factor structure underlying indicators of attitude strength, significant correlations emerged between accessibility and certainty across several respondent samples and attitude objects (ranging from .21 to .43). Bassili (1996) outlined a factor structure for attitude strength variables that distinguished those measured operatively (indirectly) from those measured
metacognitively (directly). The lone exceptions to these supposedly independent
categories were accessibility and certainty, which loaded equally well on both
metacognitive and operative factors and predicted attitude strength consequences (i.e.,
persistence and resistance) equally well.

No singular study tests all of the paths in the proposed model, however, a number
of experimental studies have examined various relationships within the model. This
literature is reviewed next and evidence is presented for each of the relationships in the
proposed accessibility model.

*Antecedents of Accessibility and Certainty: Relationships A-B & A-D.*

A relationship between accessibility and certainty is suggested by their similar
consequences (relationships B-E & D-E, respectively) described above, and their similar
antecedents (relationships A-B & A-D), discussed next. As a first example, consider
studies that have varied the behavioral experience on which an attitude is based. This
research shows that attitudes formed on the basis of direct behavioral experience are held
with greater confidence (Berger & Mitchell, 1989; Fazio & Zanna, 1978) than attitudes
formed through indirect experience. Direct experience (vs. indirect experience) has also
been associated with increases in attitude accessibility (Berger & Mitchell, 1989; Fazio,
Chen, McDonel, & Sherman, 1982). Similarly, repeated presentation of indirect
experiential information has been shown to increase both accessibility and certainty
relative to a single presentation of the same information (Berger & Mitchell, 1989).
Repeatedly expressing or indicating an attitude has been shown to affect these variables
in the same way (Holland, Verplanken, & van Knippenberg, 2003; Petrocelli, Tormala, &
Rucker, 2007).
Online vs. memory-based processing (Hastie & Park, 1996) has also been shown to affect both accessibility and certainty. For example, in a study conducted by Bizer, Tormala, Rucker, and Petty (2006), participants who were asked to form and then update their evaluation of a target person as information was presented (i.e., online processing) were both quicker to indicate their attitudes and more confident in those attitudes than were participants who saw the same information about the target person but were not asked to evaluate the target person until all of the information was provided. Instead, they were asked to rate the sentence structure of the information as it was presented (i.e., memory-based processing). Analyses in this study showed the effect of the manipulation on certainty to be independent of accessibility.

The Relationship Between Actual and Perceived Accessibility: B-C

The subjective perception of ease or fluency in retrieving information stored in memory has been shown to be influential in a wide range of judgments, from self-perceptions (Schwarz et al., 1991) to likelihood estimates (Tversky & Kahneman, 1973; see Schwarz, 2004, for a review). However, the process by which a perception of ease is formed is still unclear. In the classic ease of retrieval paradigm (Schwarz et al., 1991) participants are asked to generate either few or many examples of a category (e.g., instances of one’s own assertive behavior) and then make a judgment about the category (e.g., how assertive one is). The impact of the number of recalled examples on the ultimate judgment is said to be qualified by the perceived ease with which those examples are brought to mind. An assumption built into these studies is that the perceived ease in generating examples follows directly from the speed with which examples can be brought to mind (i.e., their accessibility). In fact, the perception of ease
is described as an accessibility experience (Greifeneder & Bless, 2007; Schwarz, 1998). Accessibility researchers have similarly defined accessibility in terms of the ease with which an attitude is activated in memory (Fazio et al., 1982; Pfau et al., 2003). Both groups of researchers often use the terms accessibility and ease interchangeably. Despite this association (or perhaps because of it) little empirical evidence exists that judgments of ease are based on actual accessibility, as both variables are never measured in the same study and meditational analyses are not conducted. At a minimum, this research aims to provide the first assessment of the relationship between actual accessibility and perceived ease.

Prior research has demonstrated the importance of differentiating between objective (or indirect) measures of a psychological construct and metacognitive (or direct) measures of that construct (Barden & Petty, 2008; Bassili, 1996; See, Petty, & Fabrigar, 2008). For example, Barden and Petty (2008) proposed that a metacognitive judgment of attitude certainty is the downstream consequence of the extent of elaboration. The authors go on to propose that perceptions of the amount of thinking are necessary to translate the feeling associated with increased elaboration into a form that can be used to infer a judgment of certainty. They add that the inclusion of perceived thought is particularly consequential because, while often perceived and actual thought will be highly correlated, they are conceptually distinct constructs and can differ under certain conditions. Of most importance is the proposition that the metacognitive interpretation (e.g., perceived thought) of a psychological process (e.g., actual thought) can serve to magnify, eliminate, or even reverse the effect of that process on an outcome (e.g., certainty; Petty, Briñol, Tormala, & Wegener, 2007). In the case of elaboration,
this means that perceived thought can lead to attitude strength consequences even if it does not stem from differences in the actual amount of thought.

The accessibility model proposed in the current set of studies incorporates a similar mechanism for attitude accessibility and perceptions of accessibility (ease). By including this relationship we hope to (1) demonstrate that a linkage exists between actual and perceived accessibility and (2) provide a potential explanation for prior studies that have failed to find a direct relationship between accessibility and certainty. For example, in the Bizer et al. (2006) study, accessibility may not have mediated the relationship between an online/memory-based processing manipulation and certainty because the manipulation (or another aspect of the study) might have resulted in perceptions of accessibility that differed from the response latency measures used in the study.

**Accessibility as a Determinant of Certainty: B-D**

The speed with which judgments come to mind has been shown to have an impact on the certainty with which those judgments are held (relationship B-D). In one study, Kelley and Lindsay (1993) found that participants for whom the answers to general knowledge questions came to mind quickly were more confident in their answers. Similar effects have been found for attitude certainty when an attitude is made temporarily accessible through repeated attitude expression. Specifically, in two studies (Holland et al., 2003; Petrocelli et al., 2007), accessibility was manipulated by having participants indicate their attitude toward target issues either once or multiple times. Mediational analyses in both of these studies showed that an increase in measured accessibility was responsible for the impact of repeated attitude expression on
participants’ confidence in their attitudes. The authors attributed this effect to feelings of fluency, related to bringing the attitude to mind quickly, serving as a signal of the attitude’s validity, though these feelings were not measured.

*Perceived Ease as a Determinant of Certainty: C-D*

There are also studies showing that subjective experiences associated with generating an attitude, specifically *perceptions* of ease in bringing to mind thoughts that support one’s attitude, can influence certainty (relationship C-D). In one study, Tormala, Petty, and Briñol (2002) found that the more difficulty participants had in bringing positive thoughts to mind the less confidence they had in those thoughts. Haddock, Rothman, and Schwarz (1996) similarly found that the more difficult it was for participants to generate arguments in favor of a proposal the less certain they were in their global evaluation, and the more difficulty they had generating *counter*arguments the more certain they were in their overall attitude (see also, Haddock, Rothman, Reber, & Schwarz, 1999; Tormala, Falces, Briñol, & Petty, 2007).

Perceptions of accessibility have also been manipulated directly and shown to have an impact on attitude certainty. In one study, Tormala, Clarkson, and Henderson (in press) manipulated participants’ perception of the speed of their attitudinal response by giving them false feedback about how quickly they indicated their attitude relative to others. They found that perceived fast speed of responding was associated with an increase in attitude certainty when participants focused on how long it took to express (as oppose to form) their attitude, when they evaluated familiar objects, and when they trusted in their gut reactions. Perceived slow speed of responding also led to an increase in certainty, but only when participants focused on how long it took to form the attitude,
evaluated novel objects, and trusted in thoughtful judgment. This study demonstrates the importance of understanding people’s naïve theories regarding the impact of accessibility on certainty. Consistent with Barden and Petty (2008), when people believe they have taken a longer time to form their attitude, presumably because of more thought involved, they have more confidence in their attitude. And, consistent with the research just reviewed on ease of retrieval, when people believe they have taken a shorter time to express their attitude, they have more confidence in it. Given the same degree of actual accessibility (which is assumed, though not recorded, by Tormala et al., in press) participants’ metacognitive appraisals of accessibility can still lead to differences in certainty.

Goals of the Current Research

The primary goal of the current set of studies was to add to the growing literature on attitude strength by providing evidence for a comprehensive model for how changes in attitude accessibility can have an impact on the confidence with which an attitude is held. As noted earlier, understanding how attitudes become strong is critical for attitude theory because enhancing attitude strength increases the extent to which attitudes are consequential (e.g., determine behavior). Focusing on accessibility and certainty is important because these are the two most influential attitude strength indicators in the literature.

Although different specific relationships within the current model (see Figure 1) have been assessed in prior research as just reviewed, no single study has examined them all simultaneously. To address this, across two studies, accessibility was manipulated (using an online/memory-based processing manipulation in Study 1 and a distraction...
manipulation in Study 2) and the variables proposed as the downstream consequences of that manipulation were measured (i.e., attitude accessibility, perceived ease of attitude retrieval, and attitude certainty). The key hypothesis is that attitude certainty can be inferred from attitude accessibility and that this relationship is mediated by a perception of how easily the attitude came to mind (relationships B-C-D in Figure 1). This differs from earlier studies on the determinants of attitude certainty (e.g., Haddock et al., 1999; Holland et al., 2003) that have used the terms accessibility and ease of retrieval interchangeably and thus only measure the effect of one or the other on certainty (B-D or C-D, respectively). Instead, the proposed model holds that the operatively measured process (accessibility) and the metacognitive perceptions of that process (perceived ease) are distinct (Barden & Petty, 2008; See et al., 2008). Another goal of this research is to demonstrate that certainty inferred via this mechanism has consequences typically associated with attitude strength (relationship D-E). Thus, in Study 2, behavioral intentions were also measured. The data collected in these studies were then fit to the model outlined in Figure 1.

A final goal of this research was to assess the impact of variables also thought to increase attitude certainty to determine whether they offer an alternative explanation for the results attributed to perceived ease. Study 1 addresses the impact of attitudes, attitude extremity, and perceived ambivalence on the current model. In addition to these variables, Study 2 also examined actual and perceived elaboration, perceived knowledge, and issue importance. In Study 2, special attention is paid to the relationship of the proposed accessibility model to actual and perceived elaboration as these variables have been shown to interact with both accessibility and certainty in prior research.
Chapter 2: Study 1

The objective of Study 1 was to provide initial evidence of the proposed link between attitude accessibility and the feeling of ease of retrieval of the attitude and of the mediating role that this operative-metacognitive link plays in the relationship between a manipulation of accessibility and attitude certainty (relationships A-B-C-D; see Figure 1). There are a variety of ways to influence attitude accessibility and for our initial test of the proposed mechanism an online/memory-based (OL/MB) processing manipulation (Hastie & Park, 1986) was selected from among the possibilities because prior research has shown that participants who form their attitudes in an online (OL) fashion have more accessible attitudes than those who form their attitudes in a memory-based (MB) fashion (Bizer et al., 2006; Mackie & Asuncion, 1990; Tormala & Petty, 2001), and they are also more certain of those attitudes (Bizer et al., 2006).

Although previous research (Bizer et al., 2006) has found a relationship between online processing and both accessibility and certainty, no relationship between accessibility and certainty was shown. Given the reasoning above, it seems unlikely that people would infer certainty directly from accessibility, but rather an intervening variable, such as perceived ease of attitude retrieval, is necessary in order to translate the actual accessibility into certainty. That is, unless participants perceive the ease of the attitude coming to mind, accessibility per se will not translate into certainty. Bizer et al. (2006) also suggested ease of attitude retrieval as one of several possible mechanisms
through which OL/MB processing leads to certainty though they did not evaluate this relationship. Thus, Study 1 used the same materials and methodology as Bizer et al. (2006), with the key addition of assessing the potential mediating variable, perceived ease. The proposed viewpoint and prior findings lead to the following predictions: (1) OL participants will report their attitudes more quickly than MB participants, (2) OL participants will sense this speed of responding and indicate greater ease in bringing their evaluation to mind, and (3) participants who feel it was easy to bring their attitude to mind will feel more certain in their attitude (Haddock et al., 1996).

In addition, measures to assess possible alternative explanations were included. First, since repeated expression of an attitude, as is done in the OL condition, has sometimes been shown to increase extremity as well as accessibility of an attitude (Downing, Judd, & Brauer, 1992) and attitude extremity has been suggested to increase certainty (Gross, Holtz, & Miller, 1995) it was important to ensure that the OL/MB manipulation did not affect extremity, to rule it out as a possible alternative mediator of the accessibility manipulation-certainty relationship.

Following Bizer et al. (2006), participants were presented with both positive and negative behaviors performed by a fictional person who served as the target attitude object. Thus, it was likely that participants would form attitudes that incorporated both types of information. Prior research has shown that holding conflicting beliefs about an object can lead one to feel ambivalent in one’s attitude, which can decrease attitude certainty (Priester & Petty, 1996; Smith, Fabrigar, MacDougall, & Wiesenthal, 2008). To address this possibility, perceived ambivalence was also measured.
Method

Participants

One hundred introductory psychology students at Ohio State University voluntarily participated in this study to partially fulfill a course requirement. Data from seven participants were excluded from analyses for failure to follow instructions (three for selecting the same response for all questions during the OL/MB manipulation and four whose response latencies were more than two standard deviations below the mean on the accessibility measures) leaving a sample of 93 participants (58% male).

Procedure

Participants were randomly assigned to one of the two experimental conditions in this study by allowing them to seat themselves at one of eleven computer stations separated by partitions. They were then presented with an OL/MB processing manipulation adapted from Bizer et al. (2006) in which they were instructed to either form an impression of a person named Marie (OL condition) or evaluate the structure of sentences about Marie (MB condition). Following the manipulation, participants completed measures in the following order: attitudes, perceived ease, certainty, and perceived ambivalence. Once these measures were completed, participants were debriefed, thanked, and dismissed.

Independent Variable: Online/Memory-Based Processing

DirectRT software (Jarvis, 2006) was used to present participants with 20 sentences describing 10 positive behaviors (e.g., Marie gladly drove her friend to the airport 50 miles away) and 10 negative behaviors (e.g., Marie lied about breaking a window) performed by a person named Marie (See Appendix C for a complete list of
stimuli). All participants saw the same 20 sentences. The 48 participants in the OL condition were told that they were involved in a study on impression formation and were asked, after each sentence, to evaluate how likable the described behavior made Marie look on a 7-point scale with endpoints labeled Not at all Likable and Extremely Likable. This procedure was used to ensure participants formed an evaluation of Marie (online) as the behaviors were presented. The assumption of this procedure is that people either update their attitude toward the target after each piece of information or form an evaluation of the target spontaneously after all information is presented.

The 45 participants in the memory-based processing (MB) condition were told that they would be evaluating sentence structure and, specifically, were asked to evaluate how “dynamic” each sentence was, paying special attention to verbs and adjectives, on a 7-point scale with endpoints labeled Not at all Dynamic and Extremely Dynamic. This was used to ensure participants read and comprehended the meaning of each sentence but were unlikely to use it to form an evaluation of Marie. Thus, evaluations of Marie would likely be formed in a memory-based fashion at the time the attitude items were presented. Each sentence was presented until the participant answered, though if they took longer than nine seconds they were prompted to respond faster.

**Dependent Variables**

*Attitude accessibility.* Using DirectRT, participants were presented with twelve attitude objects (e.g., China, Guns, Smoking) including the target object for this study (Marie), and were asked to indicate their attitude toward each object using eight semantic differential scales. The twelve items were presented in random order in eight different blocks with each block containing a different response scale. The blocks were presented
in a fixed order (good-bad, positive-negative, like-dislike, and favorable-unfavorable) with four response options available (*Extremely Bad-Extremely Good, Extremely Negative-Extremely Positive, Dislike a Great Deal-Like a Great Deal, Extremely Unfavorable-Extremely Favorable*) followed by the same scales (in the same order) with two response options (*Bad-Good, Negative-Positive, Dislike-Like, Unfavorable-Favorable*). Prior to each block, participants were reminded to indicate their attitudes as quickly and accurately as possible. Following any response over three seconds, participants were prompted to respond more quickly. Participants’ response latencies and attitudes were recorded.

Previous studies involving OL/MB processing, including Bizer et al. (2006), used only the first attitude measure as a determinant of accessibility, explaining that once MB participants had indicated their attitude once there was no longer any difference between them and OL participants. That is, at that point they both likely have stored evaluations they can access for subsequent attitudinal queries. For use in our structural equation models, however, we chose to use response latencies from the first two scales. This allows for the removal of measurement error, which is often quite high for latency measures (Cunningham, Preacher, & Banaji, 2001). Also of note was the fact that, in the current dataset, an effect of the manipulation on accessibility persisted through the first two measurement scales. Specifically, accessibility tended to be higher in the OL condition than in the MB condition for both the 4-point good-bad ($M_{OL} = 2915.63, SD = 1495.56; M_{MB} = 3366.67, SD = 1473.72; F(1, 91) = 3.50, p = .07$) and the 4-point positive-negative ($M_{OL} = 1538.40, SD = 553.94; M_{MB} = 1843.69, SD = 825.15; F(1, 91) = 3.45, p = .07$) scales but there was no conditional difference for the other six scales ($F$'s
These two items had moderate reliability ($\alpha = .52$). For this and all other dependent variables in Studies 1 and 2 indices were created for use in analyses of variance by averaging all items associated with a construct. These items were entered separately as indicators of latent constructs in structural equation modeling analyses.

**Attitudes and extremity.** Responses to the two attitude items used as a measure of accessibility were also used for the measure of attitude ($\alpha = .74$). These were also used for the calculation of attitude extremity. Extremity was calculated as, the absolute value of the difference between the participants’ selection and the midpoint of the scale ($\alpha = .52$; Downing et al., 1992).

**Perceived ease.** The remaining measures were presented to participants using MediaLab software (Jarvis, 2006). The ease with which participants perceived having retrieved their attitude toward Marie was measured using two items adapted from earlier perceived ease of retrieval studies (Schwarz et al., 1991; Tormala et al., 2002). Participants indicated how easily their evaluation of Marie came to mind on a 9-point scale anchored with Not at all Easily and Very Easily and how effortless it was to bring their evaluation of Marie to mind on a 9-point scale with endpoints Not at all Effortless and Completely Effortless. These two items had good reliability ($\alpha = .93$).

**Attitude certainty.** Three commonly used measures of attitude certainty were adapted for use in this study (Blankenship & Wegener, 2008; Fazio & Zanna, 1978;

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1 Means and standard deviations for the accessibility measures are presented in their raw (millisecond) form for ease of interpretation though log-transformed reaction times were used for all analyses.

2 The exceptions to this are the accessibility and listening items in Study 2 for which parcels were used in structural equation modeling analyses. See Study 2 for further information.
Krosnick et al., 1993). Participants indicated how certain they were of their attitude toward Marie on a 7-point scale anchored with Not at all Certain and Very Certain and how confident and sure they were that their impression of Marie was correct on two, 7-point scales anchored with Very Doubtful-Very Confident and Very Unsure-Very Sure, respectively. These three items were also highly reliable (α = .93).

**Perceived ambivalence.** The following single-item was used to measure perceived ambivalence: “To what extent do you feel conflicted reactions to Marie?” given a 9-point scale ranging from Feel No Conflict At All to Feel Maximum Conflict. This was adapted from prior research (Priester & Petty, 1996).

**Results**

**ANOVA Analyses**

A one-way, between participants analysis of variance was conducted to determine whether the OL/MB manipulation had an effect on the variables of interest in this study. The results of these analyses are summarized in Table 1.

**Accessibility.** The ANOVA showed that the processing manipulation had an effect on accessibility such that participants in the OL condition indicated their attitude toward Marie more quickly (M = 2227.01, SD = 840.95) than did those in the MB condition (M = 2605.18, SD = 963.84), F(1, 91) = 5.24, p < .05.

**Perceived ease.** Participants in the OL condition claimed significantly greater ease in reporting their attitude toward Marie (M = 6.18, SD = 1.86) than did those in the MB condition (M = 4.89, SD = 1.89), F(1, 91) = 10.90, p < .01.

**Attitude certainty.** Attitude certainty was also influenced by the processing manipulation with participants in the OL condition reporting a higher degree of certainty
in their attitude \((M = 4.83, SD = 1.25)\) than did those in the MB condition \((M = 3.64, SD = 1.37)\), \(F(1, 91) = 19.37, p < .001\).

**Attitude.** The processing manipulation did not significantly affect participants’ attitudes. Participants in the OL condition had similar attitudes \((M = .36, SD = 1.09)\) to those in the MB condition \((M = .06, SD = .95)\), \(F(1, 91) = 2.10, p = .15\).

**Attitude extremity.** There was no reliable effect of the manipulation on attitude extremity, \((M_{OL} = 1.16, SD = .29; M_{MB} = 1.10, SD = .20)\), \(F(1, 91) = 1.14, p = .29\).

**Perceived ambivalence.** An ANOVA showed that although participants experienced some degree of ambivalence, there was no reliable difference between conditions \((M_{OL} = 3.40, SD = 2.05; M_{MB} = 2.76, SD = 1.85)\), \(F(1, 91) = 2.49, p = .12\).

**Structural Equation Modeling Analysis**

Analysis of Moment Structures (AMOS) software (Arbuckle, 2004) was used to assess the fit of the proposed model (see Figure 2) to the data (see Table 2). Two additional, direct paths were added to the proposed model to assess specific meditational claims made by the current model. First, to test the claim that a perception of ease of attitude retrieval mediates the relationship between accessibility and certainty, a path was added that connects measured accessibility directly to certainty. This is akin to the Baron and Kenny (1986) test of mediation in assessing whether the effect of a predictor variable (in this case accessibility) on a dependent variable (i.e., certainty) diminishes when controlling for a mediator (i.e., perceived ease). Similarly, a path connecting the manipulation to certainty was added to test the prediction that accessibility and perceived ease, together, mediate the effect of the manipulation on certainty. The same paths are included in the proposed accessibility models tested in Study 2 (Figures 4 and 5) for the
same reasons. Similar paths were not added to the other models tested in the current research (Figures 3 or 6) as no specific meditational claims are made regarding these models.

The following indices were used as indicators of model fit for this study as well as Study 2. As is common practice in SEM research, chi-square values ($X^2$) for each model as well as the $p$-value, which tests a null hypothesis of perfect fit, are reported. Because the null hypothesis is that the model fits perfectly a $p$-value greater than .05 is desired. The $X^2$ statistic has been shown to be very sensitive to sample size (Marsh, Balla, & McDonald, 1988), leading to the rejection of plausible models, so as a correction for this, the normed chi-square (calculated as $X^2/df$; Wheaton, Muthen, Alwin, & Summers, 1977), is also reported here. Values less than 2 are considered an indication of good fit (Carmines & McIver, 1981). Also common practice is the reporting of the root mean square error of approximation (RMSEA; Browne & Cudeck, 1993) along with its 90% confidence interval. RMSEA values below .05 are said to indicate good model fit, whereas a value between .05 and .08 is said to indicate fair fit and a value greater than .10 is said to indicate poor fit (MacCallum, Browne, & Sugawara, 1996). The comparative fit index (CFI; Bentler, 1990) measures the fit of the model of interest against an independence model (i.e., a model incorporating the same observed variables but with the assumption that none of them covary). CFI values range from 0 to 1 and values greater than .95 are considered acceptable (Hu & Bentler, 1999). Finally, Akaike (1987) information criterion (AIC) values are reported which are useful solely in comparing non-nested models that utilize the same set of observed variables, where a lower AIC indicates better fit.
It is also important to understand the relationships between variables, thus standardized path weights, and their associated significance levels, are also reported. In Figures 2, 4, 5, and 6, paths that are significantly different from zero (at a $p < .05$ level) are denoted by an asterisk.\(^3\) For both studies, it was hypothesized that all paths (unless otherwise noted) would be significantly different from zero and that the relationships between variables would be directionally appropriate based on predictions from prior research.

The standardized variance for errors and disturbances (errors for latent variables) provide information about variance left unaccounted for by a variable’s directional relationship(s) with adjacent variables (similar to $1 - R^2$ in regression). This information is also reported in the figures below. Ideally, these standardized variances would be

\(^3\) In order to estimate the value of structural paths between latent variables, a scale must be assigned to each variable that makes it comparable to the others. This is done by either constraining the variance of the latent variable or by constraining one of the paths between the latent variable and one of its indicators to a constant value (Kline, 2005). AMOS v 17.0 does not allow the variance of endogenous latent variables to be constrained, thus the method of constraining path weights was used. For latent variables with three indicators, one of the path weights from each latent variable to one of its indicators was set to 1.0. For latent variables with only two indicators, both path weights from the latent variable to the indicator were constrained to equal 1.0 (Coffman & MacCallum, 2005; Little, Cunningham, Shahar, & Widaman, 2002). Although this does not affect the value of the standardized path coefficient, it does not allow for significance testing of the constrained path. Thus, in order to provide significance tests for all paths from latent variables to indicators in the figures below, measurement models were estimated for each structural model. These measurement models incorporated the same latent-to-indicator variable relationships as their respective structural model, however structural relationships (i.e., single-headed arrows) between latent variables were removed and all latent variables were allowed to covary (i.e., double-headed arrows connecting all latent variables were added). Eliminating structural relationships makes the latent variables exogenous and allows their variance to be constrained rather than their latent-to-indicator paths thus allowing for significance testing of all latent-to-indicator paths simultaneously (Kline, 2005). An asterisk for weights along arrows connecting latent variables and their indicators in Figures 2, 4, 5, and 6 denotes the path was significant (at a $p < .05$ level) in a measurement model.
small. In order for the model to estimate, path weights from error and disturbance terms to their respective observed and latent variables were constrained to equal 1.0 (Kline, 2005).

Proposed accessibility model. The data collected in this study (see Table 2) fit the proposed model well, $X^2(18) = 23.21, p = .08; X^2/df = 1.29; \text{RMSEA} = .06 (0.00, .12); \text{CFI} = .99; \text{AIC} = 59.21$. All indices of fit point toward a good model. Examining the path coefficients in Figure 2, one can see large, significant path weights for all of the structural paths connecting latent variables, and these paths are all directionally appropriate. Specifically, as the analysis of variance showed, participants in the OL condition were quicker to indicate their attitude toward Marie than were participants in the MB condition. A decrease in response latency was associated with an increase in the feeling of ease, and this increase in ease was associated with an increase in attitude certainty.

As described earlier two additional, direct paths were added to the model to assess meditational claims made by the current model. First, the path connecting measured accessibility directly to certainty was not reliable (i.e., -.03, $p = .85$). That the direct Accessibility $\rightarrow$ Certainty path was no longer significant when controlling for perceived ease suggests that, as predicted, perceived ease served as a mediator of the relationship between these two variables. Additionally, the manipulation of accessibility chosen (OL vs. MB processing) and perceived ease mediated the relationship between OL/MB processing and attitude certainty.

Discussion

Previous research has shown independent effects of OL/MB processing on attitude accessibility and certainty (Bizer et al., 2006) suggesting distinct processes were
responsible for these effects. However, the potential of a link is suggested in the literature based on prior theory suggesting a relationship between accessibility and the felt ease of attitude retrieval (Holland et al., 2003), and evidence of a link between ease and certainty (Haddock et al., 1996). Thus, the current study is the first to actually test a link between measured accessibility and felt ease of retrieval, and also the first to show a comprehensive meditational process from a manipulation of accessibility to attitude certainty. Results of the current study showed that an OL/MB processing manipulation increased attitude accessibility, perceptions of ease of attitude retrieval, and attitude certainty for participants who processed information online (relative to memory-based). Imposing structural relationships between these variables showed that accessibility and perceived ease were responsible for a substantial portion of the relationship between a manipulation of accessibility and certainty.

Study 1 also showed that the manipulation of accessibility we used continued to affect attitude certainty even after perceptions of accessibility were controlled. There are a number of possible explanations for this. One likely possibility is that the manipulation that we chose to affect accessibility (on-line versus memory-based processing) affected more than accessibility. For example, this manipulation could also have affected the amount of thought participants engaged in (Mackie & Ascuncion, 1990), and as noted earlier, the amount of thought also determines attitude certainty (Barden & Petty, 2008).
Chapter 3: Study 2

Study 1 provided initial evidence for the proposed mechanism through which accessibility can influence certainty. However, it did not address the role message elaboration might play in the accessibility model. As explained earlier, prior research has indicated that the extent of elaboration can cause changes in certainty (Barden & Petty, 2008; Petty, Haughtvedt, & Smith, 1995). Furthermore, there is some research indicating a relationship between accessibility and elaboration, although the postulated direction of this relationship varies. Given the evidence of the role of accessibility in forming certainty in Study 1, the primary goal of Study 2 was to investigate the role, if any, of elaboration.

Prior research suggests three possible relationships between accessibility and elaboration. First, consider a model in which some manipulation affects the amount of processing and this influences attitude accessibility (Figure 3, Panel 1). This relationship has been suggested in several prior studies. For example, in examining the relationship of the attitude strength-related concepts issue importance and attitude accessibility, Bizer & Krosnick (2001) build on prior work suggesting that once a person attaches significance to a particular attitude or issue that he or she may be more likely to process information pertinent to the attitude (Petty & Cacioppo, 1979). This thinking may, in turn, build and strengthen associations between concepts and their related evaluations, hence increasing accessibility. Fazio et al. (1982) also suggest elaboration, or thought
consolidation, as a means through which concept-evaluation linkages in memory can be built and strengthened (see also, Petty et al., 1995). To test this possible relationship between accessibility and thinking, a model in which thinking leads to an increase (or decrease) in attitude accessibility was tested (Figure 3, Panel 1).

Just as thinking has affected attitude accessibility, accessibility has also been shown to influence the extent of message processing. This is likely due to the power of accessible constructs, especially attitudes, to orient attention toward attitude-relevant information (Roskos-Ewoldsen & Fazio, 1992). Fabrigar, Priester, Petty, & Wegener (1998) demonstrated that an increase in attitude accessibility prior to receiving a persuasive message can result in increased scrutiny of the message. More recent research has added a caveat to this by showing that accessibility increases processing of a message when that message is counter-attitudinal but accessibility can actually decrease processing of pro-attitudinal messages (Clark, Wegener, & Fabrigar, 2008). To test this possible relationship between accessibility and thinking, a model in which accessibility prompts an increase (or decrease) in message-relevant thinking was tested (Figure 3, Panel 2).

The final possibility is that no direct relationship will be observed between accessibility and elaboration but that each variable will influence certainty independent of the other. That is, accessibility neither influences nor receives influence from extent of elaboration. If elaboration provides a distinct mechanism for certainty, this suggests that some manipulations might affect certainty via two distinct paths. One of the paths would replicate the elaboration to certainty link obtained by Barden and Petty (2008; Study 2; See Figure 3, Panel 3) whereas the other path would replicate the accessibility to
certainty link obtained in Study 1. To test this possibility, the current data were fit to another model in which a manipulation is proposed to influence certainty through two separate paths simultaneously (see Figure 3, Panel 4).

To this point, the proposed accessibility model has only been demonstrated using a manipulation of OL/MB processing, so it is unclear whether it would generalize to other factors that influence accessibility. Study 2 was designed to address this issue using a new manipulation of accessibility. A distraction manipulation was chosen for use in this study as distraction has been shown to impact elaboration (Barden & Petty, 2008; Petty, Wells, & Brock, 1976) and elaboration has been linked to accessibility in prior research. That is, if people have thought about an attitude more, they should be quicker to report it than if they have not thought about it much previously (Petty et al., 1995). It was expected that participants in the high distraction condition would be inhibited from rehearsing their attitude as they listened to an audio message, leading to a less accessible object evaluation. This would, in essence, be the complement of prior findings showing that repeating one’s attitude can lead to an increase in accessibility (e.g., Holland et al., 2003). Thus, distraction provides a face valid (though previously untested) means of manipulating accessibility that would covary with differences in elaboration. If so, the use of distraction would provide a suitable test of the relationships among accessibility, elaboration, and certainty (see Figure 3 for the various possibilities).

Also left unanswered is whether certainty formed via the proposed accessibility mechanism can be accounted for by other attitude strength related variables. So, in addition to actual and perceived amount of thought, several other potential mediators were also measured. Increases in attitude accessibility have been shown, under some
circumstances to increase issue importance (Bizer et al., 2001; Roese & Olson, 1994) and, as mentioned above, importance has been shown to affect certainty. Thus, issue importance was measured in Study 2. Perceived knowledge has also been shown to affect both certainty and accessibility (Smith et al., 2008) and was also assessed in the current study. As with Study 1, attitudes, attitude extremity and perceived ambivalence were also measured.

Finally, in order to demonstrate the usefulness of the proposed accessibility model, behavioral intention measures were added to assess the consequences of certainty formed via this mechanism. That is, we wanted to determine whether the certainty formed via inferences about accessibility would prompt people to intend to act in an attitude-consistent manner, as was previously shown with perceptions of elaboration (Barden & Petty, 2008, Study 2).

The installation of wireless fidelity (Wi-Fi) networks at Big Ten universities was chosen as an attitude object because it is a pro-attitudinal topic (Barden & Petty, 2008), expected to lead to positive attitudes across participants. Given positive attitudes, certainty can be expected to lead to a higher degree of positive behavioral responding (i.e., intentions to act in support of the issue; Ajzen & Fishbein, 1972).

Method

Participants

One hundred fifty-one introductory psychology students at Ohio State University participated in this study to partially fulfill a course requirement. Data from eight participants were excluded from analyses for failure to follow instructions (two for failure to don headphones during the audio message, two for producing response latencies that
were two standard deviations below the mean on the accessibility measures, and four for selecting the same response option for all dependent measures) leaving a sample of 143 participants (43% male).

Procedure

As in Study 1, participants entered the experimental room and sat themselves at one of eleven computer stations. They were told that a committee was interested in their feedback about a policy to replace existing wired networks at Big Ten universities with wireless networks and that they would hear a message and respond to several questions. They were then instructed to don headphones and listen to an audio message about Wi-Fi networks. The message consisted of three strong arguments in favor of installing wireless networks at Big Ten universities. The recording for each argument lasted approximately 50 seconds with a brief pause in between recordings. The three arguments can be summed up as follows: less construction hassles and associated costs, greater information security, and improved classroom instruction requiring less study time for students (See Appendix D for the full text of the message which was adapted from Barden & Petty, 2008).

To provide a manipulation of distraction, all participants engaged in a secondary task during the audio presentation of the message. Those in the high distraction condition completed numerous trials of a visual response task during the message, whereas those in the low distraction condition completed only a few distractor trials. When the audio message was complete, participants were instructed to remove their headphones. They then engaged in a five-minute filler task followed by dependent measures in the following order: attitudes, perceived ease, perceived amount of processing, certainty,
behavioral intentions, perceived knowledge, issue importance, perceived ambivalence, and actual amount of processing. Participants were then debriefed, thanked, and dismissed.

**Independent Variable: Distraction**

Participants completed what they were told was a visual response task, taken from Barden and Petty (2008) and used originally by Petty et al. (1976). In this task, participants were presented with a 2” X 2” square divided into four quadrants. An “X” appeared in the box and participants were given two seconds to indicate which quadrant it appeared in by pressing the “U” and “L” keys if it was in the Upper Left, the “L” and “R” keys if it was in the Lower Right, and so on. After practicing, participants were told they would be doing this same task while listening to an audio message. They were told that they should try to do well on the task but they were also reminded that their feedback on Wi-Fi networks is valuable so to pay attention to the recording as well. Participants in the low distraction condition were presented with two of these distractor trials during each of the three audio arguments for a total of six trials (approximately one every 25 seconds). Participants in the high distraction condition were presented with 20 distractor trials during each argument (approximately one every 2.5 seconds).

**Filler Task**

At this point, participants in the high distraction condition had significantly more practice at responding quickly to measures in this study than did participants in the low distraction condition. To ensure that this practice effect did not carry over into the accessibility measures, participants in both conditions engaged in a five-minute filler task. After the audio message and distraction task, participants removed their
headphones and completed what they were told was the “Abbreviated Geography Knowledge Assessment.” All participants were first asked to list as many U.S. states as they could in two minutes and then to list as many countries as they could in three minutes.

**Dependent Variables**

*Attitude, accessibility, and extremity.* Measures of attitudes, accessibility, and extremity were collected in a similar fashion to Study 1 with some minor changes. Participants were presented with 17 attitude objects including the object of interest, Wi-Fi networks. The items were again presented in 8 blocks, using the same two and four response option versions of the same semantic differential scales in the same order. The one exception is that the favorable-unfavorable scale for each attitude object from Study 1 was replaced with a beneficial-harmful scale.

To create the overall attitude and extremity measures used in Study 2, the same procedure were used as in Study 1. Reliability was high for both attitudes ($\alpha = .82$) and attitude extremity ($\alpha = .89$).

Unlike the case with the OL/MB processing manipulation used in Study 1, there has been no previous research on which to base predictions of how distraction might impact multiple measures of attitude accessibility. Research treating accessibility as a mediational variable has ranged from using single-item measures, as in the OL/MB studies mentioned earlier (Bizer et al., 2006; Tormala & Petty, 2001), to combining response latencies from as many as 10 items (Fazio et al., 1982). With no *a priori* reason to limit our choice regarding how many measures of accessibility to use, we chose to use
all eight measures collected in this study. This was expected to have the added benefit of increasing the reliability of the accessibility measure.

For model testing, the eight scales were combined into three parcels (see Cunningham et al., 2001; Little et al., 2002) that would serve as indicators of accessibility. The parcels were constructed to be as similar as possible so that differences between them reflected only measurement error. These three parcels, labeled in the following models and tables as ACC1, ACC2, & ACC3, showed a high degree of reliability as indicators of the accessibility latent variable ($\alpha = .77$).

*Perceived ease.* Following the attitude measures, participants were presented with two items used to measure perceived ease of attitude retrieval. Specifically, participants were asked, “How easily did your evaluation of Wi-Fi Networks come to mind?” and, “How difficult was it to bring your evaluation of Wi-Fi Networks to mind?” Responses were made on 9-point scales anchored with Not at all Easily- Very Easily and Not at all Difficult- Very Difficult, respectively. The “difficulty” item was substituted for the “effortless” item used in Study 1 because we believed that a measure of difficulty might be particularly sensitive to the effects of accessibility resulting from a distraction manipulation. This item was recoded so that higher scores on the measure indicated less difficulty. These two items were highly reliable ($\alpha = .74$).

*Actual amount of processing.* Prior research has shown the utility of measuring participants’ memory for a message (Craik & Lockhart, 1972) and message-relevant cognitive responses (i.e., thoughts; Burnkrant & Howard, 1984; Petty, 1977) as proxies for the extent of cognitive elaboration. The last two measures in the current study were separate thought and memory listings that were used to assess the extent to which
participants actually thought about the persuasive message in this study. First, participants’ memories for the three arguments presented in the message were measured by offering them four free-response boxes, asking them to, “report your best recall memory for each of the three separate audio passages you heard” and tallying the number of correctly recalled arguments as determined by independent raters, blind to condition.\(^4\) Participants were told to type “none” in these boxes if they could no longer recall any of the arguments from the message.

Next, participants’ message-relevant cognitive responses were measured by asking them to “take time to record all of the thoughts you had while learning about the Wi-Fi network issue.” They were told to type only one thought per response box and were given up to 12 boxes in which to type their thoughts. Participants were told that when they had typed in all of their thoughts they could to press the escape key to move on to the next question. The thought and memory items were standardized (\(\alpha = .59\)) which was a procedure comparable to prior studies (Barden & Petty, 2008).

Perceived processing. Participants’ metacognitive perceptions of how much they have thought about a message do not always directly correspond to actual levels of thought (Barden & Petty, 2008). For this reason, five items were used to measure the extent to which participants believed they attended to, thought about, and listened to the message. Specifically participants were asked to indicate “To what extent were you able to [think about/pay attention to] the audio information about Wi-Fi networks?” on 7-point

\(^4\) Although participants were presented with three audio arguments, each argument was composed of a number of specific justifications (see Appendix D). Participants were given four response boxes in which to record their recall memory for the arguments as it was predicted this would allow for greater variability in responses between those who were distracted while listening to the arguments and those who were not.
scales ranging from Thought a little to Thought a lot and from Paid little attention to Paid a lot of attention, respectively. They were also asked to indicate, “To what extent were you able to listen closely to the [first/second/third] passage about Wi-Fi networks?” on 7-point scales ranging from Not at all to Definitely. These three “listening” items were combined into a single index, subsequently referred to as “Listen.” Combined, these three items, the extent to which people thought about, attended to, and listened to the audio message, were also highly reliable (α = .91).

Attitude certainty. Attitude certainty was measured as it was in Study 1, and the index again showed good reliability (α = .96).

Behavioral intentions. To assess intentions to act, participants were first asked to indicate, “If you were voting for or against the proposed Wi-Fi network policy, how would you vote?” on a 7-point scale with anchor points Definitely Vote Against and Definitely Vote For. They were also asked to indicate, “How willing would you be to let us add your name to a list of students in favor of Wi-Fi networks?” and “How willing would you be to sign a petition in favor of Wi-Fi networks?” Each item was responded to on a 7-point scale ranging from Not at all Willing to Completely Willing. These items exhibited a high degree of reliability (α = .83).

Perceived importance, knowledge, and ambivalence. Issue importance was measured by asking participants to indicate, “How important is the issue of Wi-Fi networks to you personally?” on a 7-point scale with anchors Not at all Important and Very Important. Perceived amount of knowledge was assessed by asking participants to indicate, on a 7-point scale ranging from Very Little Knowledge to A Lot of Knowledge, “How much knowledge do you have about Wi-Fi Networks?” Finally, perceived
ambivalence was measured in the same way as Study 1, using a single-item measure “To what extent do you feel conflicted in your reactions to Wi-Fi networks?” with a 9-point scale ranging from Feel No Conflict At All to Feel Maximum Conflict.

Results

ANOVA Analyses

An analysis of variance was conducted on all variables and indices of interest in this study using inclusion in the high or low distraction condition as a factor (see Table 3).

Accessibility. A significant effect of the manipulation on accessibility was found such that participants who were highly distracted while listening to the audio message were significantly slower to indicate their attitudes toward Wi-Fi networks ($M = 1071.26, SD = 257.17$) than were participants who were less distracted ($M = 1000.38, SD = 236.79$), $F(1, 141) = 4.03, p < .05$.

Perceived ease. Low-distraction participants tended to report greater ease in expressing their attitudes ($M = 7.47, SD = 1.89$) than did participants in the high distraction condition ($M = 6.86, SD = 2.13$), $F(1, 141) = 3.28, p = .07$.

Actual amount of processing. Consistent with past research (Barden & Petty, 2008) participants who were less distracted while listening to the audio message demonstrated evidence of greater information processing. That is, they tended to recall more arguments and list more message-relevant thoughts ($M = .13, SD = .84$) than did highly distracted participants ($M = -.13, SD = .82$), $F(1, 141) = 3.51, p = .06$.

Perceived processing. The extent to which participants felt they were able to think about, attend to, and listen to the message was significantly impacted by the
distraction manipulation. Participants in the low distraction condition felt as though they had engaged in significantly more processing of the Wi-Fi message \((M = 4.24, SD = 1.39)\) than high distraction participants \((M = 2.90, SD = 1.33)\), \(F(1, 141) = 34.64, p < .001\).

**Certainty.** Participants in the low distraction condition were more certain that their attitudes toward Wi-Fi networks were correct \((M = 5.20, SD = 1.66)\) than were high distraction participants \((M = 4.53, SD = 1.88)\), \(F(1, 141) = 5.11, p < .05\).

**Behavioral intentions.** Low distraction participants also declared a greater willingness to participate in activities that would promote Wi-Fi networks \((M = 5.91, SD = 1.18)\) than high distraction participants \((M = 5.43, SD = 1.43)\), \(F(1, 141) = 4.79, p < .05\).

**Attitudes, perceived knowledge, importance and ambivalence.** Attitudes were not affected by the distraction manipulation, \((M_{LOW} = 1.70, SD = .53; M_{HIGH} = 1.54, SD = .63; F(1, 141) = 2.80, p = .10)\), though the trend was in the direction of less favorable attitudes under distraction consistent with past research showing that distraction can reduce persuasion when it interferes with the processing of strong arguments (Petty et al., 1976).\(^5\) Furthermore, none of the measures meant to address possible alternative causes of attitude certainty showed any effects of the distraction manipulation. Specifically, no

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\(^5\) Though there is no specific literature linking attitudes *per se* to certainty, the hint of an effect of the manipulation on attitudes in the current study resulted in the following analysis. To rule attitudes out as a potential cause of certainty, the full accessibility path model (Figure 5) was run separately with attitudes as a separate, parallel path through which certainty could be inferred. In this model there was no reliable effect of the manipulation on attitudes and the structural relationships along the proposed accessibility path remained significant when controlling for participants’ attitudes, thus this model was deemed untenable.
differences were found on attitude extremity ($M_{\text{LOW}} = 1.73, SD = .43; M_{\text{HIGH}} = 1.63, SD = .46$; $F(1, 141) = 2.09, p = .15$), issue importance ($M_{\text{LOW}} = 4.90, SD = 2.17; M_{\text{HIGH}} = 4.38, SD = 2.15; F(1, 141) = 2.13, p = .15$), perceived knowledge ($M_{\text{LOW}} = 3.61, SD = 1.57; M_{\text{HIGH}} = 3.56, SD = 1.65; F(1, 141) = .03, p = .85$), or perceived ambivalence ($M_{\text{LOW}} = 3.20, SD = 2.19; M_{\text{HIGH}} = 3.21, SD = 2.03; F(1, 141) = .001, p = .98$).

**Structural Equation Modeling Analysis**

*Proposed accessibility model.* As a replication of Study 1, we first fit the data collected (see Table 4) to the same accessibility path model used in Study 1 (see Figure 4). Good fit was demonstrated by all indices, $X^2(24) = 16.70, p = .82; X^2/df = .70$; RMSEA = .00 (.00, .04); CFI = 1.00; AIC = 58.70. All of the proposed structural paths were significantly different from zero and directionally appropriate. Increased distraction slowed participants’ responses to attitudinal queries, and they appear to have felt this difficulty, expressing less ease. Furthermore, this lack of ease led to a decrease in attitude certainty. The two additional paths (i.e., Distraction $\rightarrow$ Certainty and Accessibility $\rightarrow$ Certainty), however, were not reliable, consistent with mediation by the variables represented in the model.

The full model (Figure 1, ABCDE) was tested as well to establish that certainty resulting from this accessibility mechanism was consequential for behavioral intentions. All indices indicated a good fitting model, $X^2(50) = 63.93, p = .09; X^2/df = 1.28$; RMSEA = .05 (.00, .07); CFI = .99; AIC = 119.93, and all paths were reliable and directionally appropriate (see Figure 5). Of particular interest here is the significant coefficient for the Certainty $\rightarrow$ Behavioral Intentions path (i.e., .69, $p < .05$) showing that certainty created
via this accessibility mechanism accounted for 47% of the variance in behavioral intentions.

Two additional relationships were added to this model to assess mediation. First, perceived ease mediated the relationship between accessibility and certainty as evinced by the non-reliable value of the Accessibility → Certainty path (i.e., .04, p = .68). Additionally, the Distraction → Certainty path was not significant when controlling for the effect of accessibility and perceived ease (i.e., -.10, p = .16).

_Elaboration → accessibility alternative model._ The first alternative model (Figure 3, Panel 1) tested the notion that participants who were less distracted may have thought more extensively about the Wi-Fi message leading to greater attitude accessibility (Fazio et al., 1982). According to this view, the observed relationship between amount of message processing and response latency should be negative and reliable. If this were true it would suggest that the accessibility path proposed in the current set of studies is merely an artifact of the elaboration path laid out in Barden and Petty (2008) and limit the contribution of this research.

This alternative model exhibited good fit, $X^2(25) = 38.78, p = .04; X^2/df = 1.55; RMSEA = .06 (.02, .10); CFI = .98; AIC = 78.78$, and all of the paths were directionally appropriate. However, the key path from actual processing to accessibility, was not reliable (-.12, $p = .29$) suggesting that amount of processing of the audio message, in this study, did not lead to an increase in the accessibility of the Wi-Fi network attitude. This renders this alternative model untenable.

_Accessibility → elaboration alternative model._ There is also the possibility that, given the order of measures in this study, participants who were quicker to express their
attitudes worked harder to complete the actual processing measure that came later. If this were the case, a test of the second alternative model depicted in Figure 3, Panel 2, would show a statistically significant, negative association between accessibility and amount of processing such that participants who were quicker to report their attitude, thus having a lower response latency, would list a greater number of thoughts and message-relevant memories.  

This model also fit the data well, $X^2(25) = 27.13, p = .35; X^2/df = 1.09; \text{RMSEA} = .03 (.00, .07); \text{CFI} = 1.00; \text{AIC} = 67.13$. However, as with the first alternative model, the path of interest, that is the Accessibility $\rightarrow$ Actual Processing path, was not reliable ($- .14, p = .20$) suggesting that accessibility did not affect message processing in this study. Again, this renders the alternative model unacceptable.

Proposed elaboration model. Accessibility and elaboration do not seem to be affecting one another in the current study, and both showed effects of the manipulation, so this suggests two separate mechanisms for the impact of distraction on attitude certainty. We fit our data to the elaboration model tested by Barden and Petty (2008; Figure 3, Panel 3). The fit of our data to this model was fair, $X^2(51) = 96.70, p = .00; X^2/df = 1.90; \text{RMSEA} = .08 (.06, .10); \text{CFI} = .96; \text{AIC} = 150.70$, and path weights were significant and in the expected direction. These results provide a replication of the findings by Barden and Petty (2008, Study 2).

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6 Given the Clark et al. (2008) findings that the effect of accessibility on message processing interacts with message position one might predict that, since participants heard a pro-attitudinal message, increased accessibility would have made them less likely to process the message. However, Clark et al. (2008) refers to pre-message accessibility, which was not assessed in this study.
**Dual path model.** Given that we have now found, in the same dataset, evidence of
two distinct sets of mediators (i.e., accessibility and elaboration) through which
distraction can affect attitude certainty, we sought to test the effect these mediators would
have when entered into a single model delineating two distinct paths through which
attitude certainty can be created.\(^7\) The dual path model depicted in Figure 6 was tested.
This model, too, had good fit, \(X^2(113) = 170.74, p < .01; X^2/df = 1.51; \text{RMSEA} = .06\)
(\(.04, .08\); \(\text{CFI} = .96; \text{AIC} = 250.74\) and all paths were statistically significant and
directionally appropriate. The two paths together accounted for 62% of the variance in
Certainty. Furthermore, the path weight of the Certainty \(\rightarrow\) Behavioral Intentions path
was large and significantly different from zero showing that certainty paired with
uniformly positive attitudes led to an increase in intentions to support the Wi-Fi network
policy.

The overall model shows that, under the current circumstances, attitude certainty
can result from multiple processes simultaneously and that this certainty can affect
intentions to behave in accordance with one’s attitude. That accessibility and amount of
processing are shown to be conceptually distinct mediators of the impact of distraction on
certainty implies that consequential certainty can result from an increase in elaboration,
as has been shown before, and an increase in accessibility, as demonstrated in the current

\(^7\) Though the direct effect of the distraction manipulation on certainty was no longer
significant when controlling for perceived ease derived from accessibility (see Figure 5),
actual and perceived elaboration were assessed as additional mediators of the effect of the
distraction manipulation on certainty. Several authors have argued that a significant
direct effect is not necessary in order to test mediation (e.g., MacKinnon, 2000; Shrout &
Bolger, 2002). That is, even when Baron and Kenny (1986) procedures suggest that full
mediation has presumably occurred, it is possible to obtain evidence of additional
mediation (e.g., see Tormala et al., 2007, for an example).
set of studies. Notably, the certainty produced by accessibility and elaboration was mediated by perceptions of accessibility and elaboration as indexed by our perceived ease of attitude retrieval and perceived amount of thought measures.

Discussion

In discussing dimensions of attitude strength, Krosnick et al. (1993) suggested that future research should examine causal relationships among attitude strength variables. This was the primary focus of Study 2. Specifically, we examined the interrelatedness of the accessibility process mechanism proposed in the current set of studies and one of the most researched attitude strength constructs -- extent of elaboration. Under circumstances where a variable (e.g., distraction) affects both the amount of elaboration and accessibility, and each in turn predicts certainty, there are three potential relationships for these two antecedents of certainty, (1) elaboration leading to an increase in accessibility, (2) accessibility leading to an increase in elaboration, and (3) elaboration and accessibility each having a distinct influence on certainty.

Based on testing of alternative models, no evidence was found for a relationship between accessibility and the amount of processing in this dataset. Instead, and consistent with predictions, accessibility had an impact on certainty independent of message elaboration. That is, elaboration did not influence accessibility, accessibility did not affect elaboration, and elaboration did have an effect on certainty through the metacognitive mediator, perceived elaboration. This finding combined with the replication of the accessibility mechanism first tested in Study 1 with a new manipulation of accessibility and a new attitude object provide strong evidence of two distinct processes through which certainty can be created or changed even when using the same
manipulation. These processes led to the formation of attitude certainty even when controlling for the other.

Providing evidence for two distinct processes through which attitude certainty can be formed offers a more complete explanation of certainty effects. That these two concepts are orthogonal suggests that one could be confident in an attitude, despite not having thought a great deal about the attitude object, because the evaluation of that object has been made accessible in memory. Conversely, one could be confident in a relatively inaccessible attitude because he or she recalls having thought a great deal about it. Furthermore, certainty was shown to influence participants’ intentions to behave in an attitude-consistent manner demonstrating that certainty formed via these processes is consequential.

Aside from elaboration, several possible alternative factors that could influence certainty were assessed. An analysis of variance showed that distraction had no impact on attitude extremity, importance, perceived knowledge or perceived ambivalence leading to these factors being ruled out as mediators of the impact of distraction on certainty.

Finally, Study 2 provided clear evidence that a manipulation of distraction can influence attitude accessibility. This offers a potential tool for experimenters to use to induce experimental differences in accessibility, particularly under circumstances where parallel changes in the amount of processing are desirable.
Chapter 4: General Discussion

Research in the persuasion domain has offered a number of insights on how attitude accessibility can serve as both a direct indicator of attitude strength (Bassili, 1996; Fazio et al., 1982; Fazio & Williams, 1986) as well as an antecedent of other attitude strength indicators (Holland et al., 2003; Kelley & Lindsay, 1993). Despite the extensive prior research on accessibility, a mechanism through which a manipulation of accessibility produces stronger attitudes remains unclear. The core proposal of this research is that people can often perceive the degree of actual attitude accessibility (perceived ease) from which they derive a sense of attitude certainty that gives an attitude its strength.

Most existing research in this area has used the terms attitude accessibility and perceived accessibility (or ease) interchangeably while acknowledging the likelihood of causal relations between the two variables (Haddock et al., 1999; Holland et al., 2003). In contrast, the current research has distinguished these constructs and argued that perceived accessibility can be an important contributor to attitude strength consequences (via certainty). That is, perceived ease could enhance attitude strength in the absence of real differences in accessibility just as perceived elaboration enhances strength in the absence of real differences in elaboration (Barden & Petty, 2008). Furthermore, when a manipulation of accessibility produces changes in strength, it will do so to the extent that it also affects perceived ease and certainty. The current research showed that certainty
created via perceived ease is consequential in terms of participants’ intentions to behave in accord with their attitudes. Finally, potential alternative explanations for the current model were also addressed, with particular emphasis on actual and perceived elaboration. Given the interrelated nature of accessibility and elaboration and the existence of a current model for how elaboration (and perceptions of elaboration) can affect attitude certainty, another goal of the current paper was to differentiate the effects of the accessibility mechanism proposed here from the elaboration mechanism proposed by Barden and Petty (2008).

In Study 1, perceived ease mediated the relationship between actual accessibility and certainty, demonstrating that participants’ judgments of certainty were inferred from perceptions of accessibility (ease), not from accessibility itself. Additionally, actual accessibility and perceived ease mediated the relationship between an online/memory-based processing manipulation and certainty providing initial evidence for the proposed accessibility mechanism (Figure 2). A distraction manipulation led to similar findings in Study 2 (Figure 4). Of note in both of these studies were the sizable causal relationships between accessibility and perceived ease and between perceived ease and certainty. These findings suggest that people can accurately recognize the speed with which their attitudes come to mind and use this judgment of perceived speed/ease to inform their belief in the confidence with which they hold their attitude. Taken together, these studies provide the first evidence of a comprehensive mechanism through which accessibility can lead to differences in attitude certainty.

Attitude strength variables are defined by the extent to which they make an attitude more durable and impactful (Krosnick & Petty, 1995), so demonstrating that
certainty impacted participants’ intentions to behave in an attitude consistent manner was important. Study 2 established that certainty created via this accessibility mechanism is consequential. Nearly half of the variance in behavioral intentions was explained by that variable’s causal relationship with certainty (Figure 5).

A number of other variables that represent possible alternative explanations for the findings in these studies were also tested and the collected data failed to support these alternate accounts. That is, in both studies, there were no difference in attitudes, attitude extremity, and perceived ambivalence across experimental conditions. In Study 2, issue importance and perceived knowledge were also assessed as potential alternative explanations and they, too, did not differ across conditions. Although prior research has shown an increase in these variables to be associated with an increase in certainty (or a decrease in certainty in the case of ambivalence) no such relationship was found in the current research, likely because the manipulations used in this research did not and were not expected to influence these variables.

The distraction manipulation used in Study 2 affected both accessibility and elaboration, as well as perceptions of these two variables, though these effects were determined to be independent of one another through the testing of several alternative models (See Figure 3). Analyses suggested that the proposed accessibility mechanism (Figure 5) and the elaboration mechanism proposed by Barden and Petty (2008; Figure 3, Panel 3) uniquely and jointly affected attitude certainty. That is, when both routes to certainty were tested simultaneously (i.e., with the effect of one controlling for the other) both still demonstrated an impact on attitude certainty and this combined impact on certainty was shown to be consequential for behavioral intentions (Figure 6).
Implications

This research offers a number of important implications for prior and future research. First, looking back at studies that have demonstrated a connection between accessibility and certainty (Holland et al., 2003; Kelley & Lindsay, 1993; Petrocelli et al., 2007), the current accessibility model suggests that these studies may have found a relationship between accessibility and certainty because participants formed a judgment of ease of attitude retrieval and used this judgment to inform the certainty with which they hold their attitude even though they were not prompted to do so by researchers. It is likely that this unsolicited perception of ease, not accessibility directly, affected subsequent measures of certainty.

The implications of the current research for prior ease of retrieval work are less clear. Though ease could potentially be inferred from accessibility as was demonstrated in the current research and has been suggested by prior research (Haddock et al., 1999; Schwarz, 1998), it is not clear whether ease measured in the classic ease of retrieval studies is the product of real differences in accessibility (since accessibility is not measured) or whether it is inferred directly from the manipulation in the absence of any real accessibility differences. The current accessibility model allows for either possibility (i.e., ease is conceptualized as a downstream consequence of accessibility and thus affecting ease directly would not necessarily affect upstream variables). This is similar to the thoughtfulness heuristic (Barden & Petty, 2008) in which perceptions of the amount of thought can be manipulated directly without any impact of the manipulation on actual amount of thought. Future research could use the classic ease of retrieval manipulation
(Schwarz et al., 1991), measure accessibility in addition to perceived ease and certainty, and fit those data to the current model (Figure 1).

Prior Accessibility Research

It is important to acknowledge that in the current studies, a manipulation of attitude accessibility led to an increase in attitude certainty and an increase in attitude strength consequences (i.e., behavioral intentions) via a metacognitive mechanism. Participants perceived and formulated a judgment about how quickly they were able to bring their attitude to mind. They used their perception of ease as an input to certainty. Finally, they used this determination of certainty to inform a subsequent judgment about behaving in a manner consistent with their attitudes. This process likely requires some amount of attentional and processing resources in order to function.

In this regard, this metacognitive interpretation is different from much of the previous attitude research in which accessibility is treated as a proximal determinant of attitude strength consequences, unmediated by metacognition. It is important to note that the current set of studies is not meant to displace or undermine this prior research but rather to offer another means through which accessibility can lead to attitude strength consequences.

The Motivation and Opportunity as DEterminants (MODE) model (Fazio & Towles-Schwen, 1999; Sanbonmatsu & Fazio, 1990; Schuette & Fazio, 1995) can be used to differentiate between situations in which accessibility serves as a direct guide to behavior (or other attitude strength consequences) and when more deliberative, metacognitive processes might intervene in determining the impactfulness of an attitude. In prior studies, when motivation and ability to process information were limited,
response latency measures reliably predicted participants’ behavior. When participants were given the opportunity to think about the information presented to them and were properly motivated to do so, accessibility was less useful as a predictor of behavior. Fazio and colleagues suggest that when motivation and opportunity to process information are high, a number of processes can be at work simultaneously, limiting the effectiveness of accessibility itself as a predictor of attitude strength consequences.

In the current set of studies, participants were adequately motivated to attend to the persuasive messages and were allowed ample time to answer each of the behavioral intention questions. Indeed, the metacognitive approach to understanding the impact of accessibility outlined in this paper might be especially likely to occur in situations in which motivation and opportunity to process information in relation to one’s behavior are moderate to high. If, instead, participants were not motivated to make an optimal behavioral decision, were forced to make that decision more quickly, or were otherwise unable to evaluate all of the information about an attitude object available to them, it is plausible that the accessibility of the attitude would have a direct impact on choice. Some prior research has demonstrated that the metacognitive versus structural aspects of a variable can have differential impacts depending on the person’s cognitive resources at the time (e.g., See et al., 2008). Future research should evaluate how manipulations of motivation and ability moderate the impact of metacognitive perceptions of accessibility on attitude strength consequences.

Operative/Metacognitive Distinction

The current studies also offer clarification to the operative/metacognitive distinction made by Bassili (1996). Specifically, Bassili (1996) found operative
measures, in general, to be better predictors of attitude strength consequences than metacognitive measures (though certainty was an exception). The current research, along with the interpretation of the MODE model described above, suggest that under circumstances where motivation and ability to process information or decide on a course of action are adequately high, the predictive validity of an operatively measured construct (e.g., accessibility) might be subject to the influences of a metacognitive interpretation (e.g., perceived ease) and factors that have been shown to affect those interpretations (e.g., believing one’s attitude coming to mind quickly is good or bad; Briñol, Petty, & Tormala, 2006). On the other hand, when motivation and ability to deliberate are low, operatively measured constructs such as accessibility might operate directly.

Limitations and Suggestions for Future Research

In Study 2, distraction was used to simultaneously manipulate accessibility and elaboration to determine their effects on certainty and on each other. The data collected showed that these two processes have distinct relationships with certainty though, as mentioned in the introduction to Study 2, prior research has shown varying relationships between these two attitude strength variables. Future research should address factors that moderate whether these two mechanisms remain distinct versus have causal effects on one another and how certainty derived from these varying processes is impacted.

A closer examination of antecedents to the proposed accessibility model (i.e., manipulations that uniquely affect accessibility and subsequently certainty) is also warranted. This along with further study of the consequences associated with certainty created via accessibility (e.g., resistance to attitude change) would offer greater explanatory power to the current research as well as offer practical considerations for
those interested in applying the current findings in various applied contexts (e.g., Rucker & Petty, 2006).

The current model outlines a mechanism for the construction of attitude confidence judgments but does not address the role of stored representations of certainty; a novel attitude object (Marie) was used in Study 1 and pre-message attitude certainty was not assessed in Study 2. Prior research and theory have suggested that people can assign tags of validity or invalidity to their mental contents (Gilbert, 1991; Mayo, Schul, & Burnstein, 2004; Petty, Briñol, & DeMarree, 2007). These tags could have implications for subsequent judgments of certainty formed via the proposed model. That is, being confident in an attitude could affect processes that, in turn, affect accessibility, leading to a polarizing or moderating revision of the stored representation of certainty, which could then affect later processes, and so on. For example, a person highly certain of an initial attitude might decide that thinking about a message relevant to that attitude is not necessary. Following the message, however, if the person realizes that little thought took place, attitude certainty might be decreased, which would then increase the likelihood of processing a subsequent message on the topic.

Finally, despite the lack of an effect on the alternative explanation variables in the current research, they, too, have histories as moderators of attitude strength consequences. Future research could use the current study, as well as Barden and Petty (2008), as a framework for elucidating other mechanisms through which certainty can be inferred (e.g., actual and perceived extremity, actual and perceived ambivalence, actual and perceived knowledge).
Conclusion

The current research provides additional evidence for the view that when a consequential decision is made, for example whether or not to vote for a campus policy, an initial consideration of how confident one is in his or her attitude toward that policy is undertaken. This research goes on to suggest that in determining certainty, a number of different pieces of information are considered including the ease with which one’s attitude comes to mind. Although this decision can sometimes be based on an accurate assessment of the attitude’s accessibility (as is shown here), prior research has shown that perceptions of accessibility or ease can be manipulated in the absence of real differences. Taken together, the current studies offer one means through which a determination of certainty can be derived without substantial elaboration about the pros and cons of a particularly message -- via actual and perceived accessibility.
References


## Appendix A: Tables

### Table 1.
Dependent variables as a function of processing condition in Study 1.

<table>
<thead>
<tr>
<th>Dependent Measure</th>
<th>Processing Condition</th>
<th>ANOVA Test of Difference Between Processing Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Online Processing (n = 48)</td>
<td>Memory-Based Processing (n = 45)</td>
</tr>
<tr>
<td>Accessibility</td>
<td>F(1,91) = 5.24, p &lt; .05</td>
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</tr>
<tr>
<td>( M )</td>
<td>2227.01</td>
<td>2605.18</td>
</tr>
<tr>
<td>( SD )</td>
<td>840.95</td>
<td>963.84</td>
</tr>
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<td>Perceived Ease</td>
<td>F(1,91) = 10.90, p &lt; .01</td>
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</tr>
<tr>
<td>( M )</td>
<td>6.18</td>
<td>4.89</td>
</tr>
<tr>
<td>( SD )</td>
<td>1.87</td>
<td>1.89</td>
</tr>
<tr>
<td>Certainty</td>
<td>F(1,91) = 19.37, p &lt; .001</td>
<td></td>
</tr>
<tr>
<td>( M )</td>
<td>4.83</td>
<td>3.64</td>
</tr>
<tr>
<td>( SD )</td>
<td>1.25</td>
<td>1.37</td>
</tr>
<tr>
<td>Attitude</td>
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<td></td>
</tr>
<tr>
<td>( M )</td>
<td>0.36</td>
<td>0.06</td>
</tr>
<tr>
<td>( SD )</td>
<td>1.09</td>
<td>0.96</td>
</tr>
<tr>
<td>Attitude Extremity</td>
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</tr>
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<td>1.16</td>
<td>1.10</td>
</tr>
<tr>
<td>( SD )</td>
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<td>0.20</td>
</tr>
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<td>( M )</td>
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</tr>
<tr>
<td>( SD )</td>
<td>2.05</td>
<td>1.85</td>
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Table 1. Dependent variables as a function of processing condition in Study 1.
Table 2. Correlation matrix of manipulated and measured variables with means and variances for Study 1. Note: Numbers on the main diagonal represent variances. \( N = 93 \). ** \( p < .01 \), * \( p < .05 \).

<table>
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<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
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<tr>
<td>1. OL/MB</td>
<td>(.25)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Good (Accessibility)</td>
<td>.19</td>
<td>(.03)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3. Positive (Accessibility)</td>
<td>.19</td>
<td>.35*</td>
<td>(.03)</td>
<td></td>
<td></td>
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<td>4. Easily (Perceived Ease)</td>
<td>-.36*</td>
<td>-.27*</td>
<td>-.17</td>
<td>(4.31)</td>
<td></td>
<td></td>
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<td>5. Effortless (Perceived Ease)</td>
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<td>-.13</td>
<td>.86**</td>
<td>(4.10)</td>
<td></td>
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<tr>
<td>6. Certain (Certainty)</td>
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<td>-.18</td>
<td>-.17</td>
<td>.63**</td>
<td>.58**</td>
<td>(2.41)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Sure (Certainty)</td>
<td>-.36*</td>
<td>-.19</td>
<td>-.20</td>
<td>.64**</td>
<td>.58**</td>
<td>.87**</td>
<td>(2.31)</td>
<td></td>
</tr>
<tr>
<td>8. Confident (Certainty)</td>
<td>-.37*</td>
<td>-.14</td>
<td>-.08</td>
<td>.65*</td>
<td>.60*</td>
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<td>.79*</td>
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<td>3.19</td>
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<td>High Distraction (n = 72)</td>
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<tr>
<td>Accessibility</td>
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<td>$F(1,141) = 4.03, p &lt; .05$</td>
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<tr>
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<td>Perceived Ease</td>
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<td>Actual Processing</td>
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<td>Certainty</td>
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<td>Behavioral Intentions</td>
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<td>Attitude</td>
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</table>

Table 3. Dependent variables as a function of distraction condition in Study 2.
Table 3 continued

<table>
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<tr>
<th></th>
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<th>F(1,141) = 2.09, p = .15</th>
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<td>1.63</td>
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<td>$SD$</td>
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<td>.46</td>
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<td>Issue Importance</td>
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</tr>
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<td>$M$</td>
<td>4.90</td>
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<td>F(1,141) = .03, p = .85</td>
</tr>
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<td>$M$</td>
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<td>$SD$</td>
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<tr>
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<tr>
<td>$SD$</td>
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</table>
Table 4. Correlation matrix of manipulated and measured variables with means and variances for Study 2. Note: Numbers on the main diagonal represent variances. \( N = 143 \). ** \( p < .01 \), * \( p < .05 \).

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<tr>
<th>Variable</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(.02)</td>
</tr>
<tr>
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<td>.59**</td>
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<td></td>
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<td>(.01)</td>
</tr>
<tr>
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<td>.54**</td>
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<td></td>
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<td>-.20*</td>
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<td>.58**</td>
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<td>.18*</td>
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<td>-.15</td>
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<td>11. Listen (Perceived Processing)</td>
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<td>-.11</td>
<td>-.16</td>
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<td>-.23*</td>
<td>-.15</td>
<td>-.15</td>
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<td>-.18*</td>
<td>-.23**</td>
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Table 4 continued
Appendix B: Figures

Figure 1. Proposed accessibility model.

Figure 2. Structural equation model results for accessibility model in Study 1. * $p < .05$; ns $p > .05$; solid line = significant relationship; dotted line = non-significant relationship.
Figure 3, Panel 1. Alternative model number 1: A test of message processing affecting accessibility.

Figure 3, Panel 2. Alternative model number 2: A test of accessibility affecting message processing.

Figure 3, Panel 3. Proposed elaboration model (adapted from Barden & Petty, 2008; Study 2).
Figure 3, Panel 4. Proposed dual path model.

Figure 4. Structural equation model results for abbreviated accessibility model in Study 2. * $p < .05$; ns $p > .05$; solid line = significant relationship; dotted line = non-significant relationship.
Figure 5. Structural equation model results for full accessibility model in Study 2. * $p < .05$; ns $p > .05$; solid line = significant relationship; dotted line = non-significant relationship.
Figure 6. Structural equation model results for dual path model in Study 2. * $p < .05$. 

Appendix C: Positive and Negative Behaviors Used in Study 1.

Marie lied about breaking a window.

Marie spent much of her free time helping the homeless during the winter.

Marie gladly drove her friend to the airport 50 miles away.

Marie made several loud and rude comments when the line at the bank was moving too slowly.

Marie stole $20 from a friend.

When Marie found a wounded bird, she nursed it back to health.

Marie became aggressive one night after drinking heavily.

Marie bought groceries for her elderly neighbor during a snowstorm.

After witnessing a car accident, Marie stopped her car and offered assistance and called 911.

Marie treated her brother and sister to lunch one day.

When Marie scraped the side of another car in the parking lot, she just drove away.

Marie threw a surprise party for her mother’s 50th birthday.

Marie vandalized a store window while in college.

Marie gambled away her paycheck.

Marie offered to take a shift for a sick coworker.

Marie volunteers to direct student plays at the high school.

Marie did not stop to offer a ride to her friend who was waiting at the bus stop in the rain.

Marie cheated on a test in school.

Marie puts coins in expired parking meters.

Marie stranded her boyfriend at the airport.
Appendix D: Wi-Fi Network Arguments Used in Study 2

Argument 1: According to a recent assessment by the Army Corps of Engineers, campuses that adopt a wireless network will be able to avoid costly and time consuming upgrades which are associated with increasing the capacity of landline networks. This savings could comprise up to 40% of the overhead costs of providing computers to students and employees. Because Wi-Fi networks are upgradeable without rewiring within and between buildings adopting this technology greatly reduces tunneling and construction work which greatly inconveniences people trying to walk or drive around. Taken together, the report cited that Wi-Fi networking technology as one way to lower costs.

Argument 2: One important feature of wireless fidelity networks is that they are completely secure unlike many other networking solutions. This is because Wi-Fi networks make use of high frequency 2.4 GHz bandwidth and 128-bit encryption. This means that your private information from e-commerce to personal communications is guaranteed to be safe. Wi-Fi networks are a newer technology so the architecture provides a more secure firewall, making your computer invisible to the network. Thus a Wi-Fi network is much safer than using Internet, cable modem, DSL, or dialup connection. Altogether using a Wi-Fi connection protects your personal information and your computer by providing a secure connection.
Argument 3: The National Scholarship Achievement Board recently released a report where they compared learning opportunities at 30 universities. Students rated the quality of teaching 25% higher at institutions with wireless fidelity networks. In addition, faculty reported that faster and more convenient Internet access meant that they updated their course content every year rather than every 3-5 years making it more relevant to students. Students, in turn, reported that they could get away with studying 3 hours less per week and still get the same grades because the network allowed them to master the material with a lot less effort. Thus the Wi-Fi network makes class time more interesting and easier for students.