ATTITUDE-RELEVANT THOUGHT, ATTITUDE CERTAINTY, AND RESISTANCE TO PERSUASION

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ABSTRACT

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Persuasion literature contains prevalent claims that attitude certainty fosters resistance to persuasion. The citations provided for such a relationship, however, fall short of examining the role of attitude certainty in resistance to persuasive attempts. Therefore, an experiment was designed to examine whether attitudes held with greater certainty are more resistant to change in the face of persuasive attacks. Subjects were assigned randomly to receive a high certainty induction (thinking about an attitude topic) or a low certainty induction (thinking about an unrelated topic) prior to measuring pretest attitudes. One week later, subjects were assigned randomly to receive or not to receive a persuasive message prior to measuring posttest attitudes. Contrary to previous research, this study found no evidence that attitude certainty moderated the degree to which attitudes changed in response to a persuasive message. However, the results provide some evidence of an inverse relationship between attitude certainty and the mere presence of attitude change. Limitations of the study, implications of the findings, and ideas for future research are discussed.

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Attitude-Relevant Thought, Attitude Certainty, and Resistance to Persuasion

A man with conviction is a hard man to change. Tell him you disagree and he turns away. Show him facts or figures and he questions your sources. Appeal to logic and he fails to see your point. ...suppose that he is presented with evidence, unequivocal and undeniable evidence, that his belief is wrong: what will happen? The individual will frequently emerge, not only unshaken, but even more convinced of the truth of his beliefs than ever before. (Festinger, Riecken, & Schachter, 2011, p. 7)

That those who are certain about their beliefs are unshakeable and resistant to change has long been proclaimed in the social sciences and this belief continues to predominate persuasion literature today (e.g., Gopinath & Nyer, 2009). Indeed, perusal of literature in the social sciences reveals prevalent claims asserting that attitude certainty, or the confidence that one has in the accuracy or correctness of one's attitude, moderates the magnitude of attitude change observed in response to persuasive appeals (e.g., Tormala & Rucker, 2007). Although such claims maintain that attitudes held with high certainty are more resistant to persuasion than are attitudes held with low certainty (Tormala & Rucker, 2007), there is a dearth of evidence consistent with this proposition.

Despite the paucity of empirical studies investigating the impact of attitude certainty on resistance to persuasion, understanding the role of certainty in resistance to counterattitudinal attacks may contribute to our understanding of the cognitive processes underlying resistance to persuasion. The purpose of this paper is to review briefly extant research on attitude certainty and to propose a model of resistance to persuasion in which attitude certainty moderates attitude change in response to a persuasive message. After outlining the model, an experiment designed

to test the model is presented, followed by a discussion of the results and implications of findings.

Attitude Certainty

Scholars have long been interested in understanding factors that influence susceptibility and resistance to persuasive appeals. Though researchers have developed a number of avenues for such research, including investigations of message features and of source characteristics (Pornpitakpan, 2004), the focus of this endeavor is attitude certainty, which is a component of attitude strength (Gross, Holtz, & Miller, 1995; Krosnick, Boninger, Chuang, Berent, & Carnot, 1993). Although Suchman (1950) used the term attitude certainty to describe the strength or intensity with which an attitude is held, this paper uses a more common definition, which holds that attitude certainty refers to the degree to which one is confident in the accuracy or correctness of one's attitude (e.g., Gross et al., 1995). Implicit in this definition is the notion that attitude certainty is a meta-cognitive (Petty, Briñol, Tormala, & Wegener, 2007) or a meta-attitudinal (Bassili, 1996) judgment of attitude strength that results from thinking about one's thoughts (or, in this case, thinking about one's attitudes).

As a component of attitude strength, attitude certainty is purported to regulate the durability and the impactfulness of attitudes (Krosnick & Abelson, 1992; Krosnick et al., 1993). Specifically, compared to attitudes held with little certainty ("weak attitudes"), attitudes held with high certainty ("strong attitudes") have greater stability over time and they are purported to have a greater impact on a person's thoughts, feelings, and actions (Bassili, 1996; Gross et al., 1995; Krosnick & Abelson, 1992; Krosnick et al., 1993). Despite this range of effects that attitude certainty is purported to have, the bulk of research related to attitude certainty has focused on examining the role of attitude certainty in the relationship between attitudes and

behavioral intentions (e.g., Franc, 1999; Tormala & Petty, 2002). Such research provides evidence consistent with the idea that, compared to attitudes held with little certainty, attitudes held with greater certainty tend to be better predictors of behavioral intentions (e.g., Franc, 1999; Tormala & Petty, 2002) and of behavior (Warland & Sample, 1973). To date, there has been much less research on the role of attitude certainty in attitudinal persistence, or stability, over time (one study, conducted by Bassili, 1996) and in attitudinal resistance to persuasive attacks (one study, conducted by Petrocelli, Tormala, & Rucker, 2007). The results of the studies that have examined the role of attitude certainty in attitudinal stability and resistance to persuasion provide some evidence that attitudes held with greater certainty, as compared to attitudes held with lesser certainty, tend to be more stable over time (Bassili, 1996) and more resistant to persuasive attacks (Petrocelli et al., 2007).

Speculations About Attitude-Relevant Thought and Attitude Certainty

The moderating role of attitude certainty in the relationship between attitudes and behavioral intentions has generally been attributed to attitude certainty serving as a proxy for attitude development, or the amount and frequency of thought given to an attitude object prior to elicitation or measurement of the attitude (Warland & Sample, 1973). Specifically, attitudes that are not well-established prior to being measured (i.e., newly formed attitudes) are thought to be held with low certainty and attitudes that are based on extensive thought and that are wellestablished prior to being measured (i.e., pre-existing attitudes) are presumed to be held with high certainty (Sample & Warland, 1973; Warland & Sample, 1973). Assuming that attitude certainty was a proxy for attitude development, Warland and Sample (1973) speculated that, unlike attitudes held with high certainty, attitudes held with low certainty might not take into account all relevant information that is required for a thorough assessment of all elements of an

attitude object. Therefore, the researchers reasoned that, due to exclusion of important attituderelevant information, attitudes held with low certainty should be poor predictors of actual behavior. Warland and Sample, however, did not publish any studies that tested their speculations.

The idea that attitudes based on extensive elaboration might be more durable and more impactful than attitudes based on little elaboration is not unique to Warland and Sample's (1973) reasoning about attitude certainty. In fact, Warland and Sample's speculations were inspired by a seminal paper on attitude stability in which Converse (1964) discussed the role of cogitation in distinguishing between stable and ephemeral political attitudes. In that paper, Converse (1964) postulated that the difference between stable and ephemeral political attitudes lies in the cognitive foundations of such attitudes. Specifically, Converse argued that stable attitudes develop when an attitude object is relevant (as opposed to irrelevant) to a person's goals; presumably, because persons are motivated to ruminate about topics that have the potential to facilitate or impede goal attainment. Furthermore, Converse (1964) argued that elaborate contemplation causes attitudes to become entrenched in an ideology, or a belief system, that serves to stabilize attitudes over time. This claim was premised on the notion that thinking about attitude-relevant beliefs (that constitute a belief system), over time, increases the logical consistency of the belief system (McGuire, 1960; also see Tesser, 1978). Converse also asserted that the set of logical beliefs that results from extensive attitude-relevant thought provides support for holding a particular attitude and, thus, serves to stabilize, or crystallize, a person's attitude (Converse, 1964).¹

If extensive contemplation of an attitude object increases the degree to which an attitude is embedded in a system of logical beliefs that supports and crystallizes the attitude (Converse,

1964; McGuire, 1960; Millar & Tesser, 1986), then one would expect relatively few (numerous) attitude-relevant beliefs to underlie nascent (explicated) attitudes. Furthermore, given that a person's confidence tends to increase as pertinent information increases (Tsai, Klayman, & Hastie, 2008) and as the viability of alternatives decreases (Berlyne, 1962), one might expect relatively thoughtful attitudes to be held with greater confidence than relatively thoughtless attitudes. Indeed, at least one study, conducted by Barden and Petty (2008), provides evidence consistent with the proposition that extensive (as opposed to minimal) thought tends to be associated with greater attitude certainty.

Attitude Certainty, Attitude Stability, and Resistance to Persuasion

Due to the aforementioned cognitive consequences of engaging in attitude-relevant thought, namely cognitive consistency, generation of support for one's attitude, consideration of all relevant information, and ultimately high levels of attitude certainty, one might anticipate that attitudes formed on the basis of extensive (as opposed to minimal) thought will not only be held with greater certainty, but that they will also be more stable over time.² It is also plausible that, due to the consequences of engaging in attitude-relevant thought, attitudes held with greater certainty will be more resistant to change in the face of persuasive attacks. Indeed, there are a number of reasons that one might expect attitude certainty to impact resistance to persuasion. For instance, as the amount of time spent thinking about an attitude object increases, it is likely that people generate more reasons for holding their attitude. Furthermore, one might expect that the greater the number of reasons for holding an attitude, the more adept one will be in warding off counterattitudinal attacks with counterarguments and/ or pro-attitudinal arguments (i.e., cognitive responses; Greenwald, 1968). This idea is consistent with existing cognitive models of persuasion, which assert that if a person engages in extensive thought about an attitude object,

then they should be better able to respond to persuasive appeals with counterarguments (Petty & Cacioppo, 1986).

Similarly, one might anticipate that, as a result of thinking about an attitude object, attitudes held with greater (as opposed to lesser) certainty will be more resistant to persuasion due to the system of beliefs in which such attitudes are embedded.³ To the extent that greater contemplation of an attitude object causes an attitude to become embedded in a system of beliefs that are internally consistent, it is likely that persons who engage in greater thought will call to mind a greater number of cognitions (i.e., internal messages) that are consistent with their own attitude if presented with an external persuasive message (Hunter et al., 1976). Therefore, it is possible that, as a result of contemplating the attitude object, persons with greater (as opposed to lesser) attitude certainty might be better equipped to engage in defensive processes, such as attitude bolstering or counterarguing, with facility when presented with a persuasive attack.

Alternatively, it is possible that attitude certainty influences attitudinal resistance to change via its impact on message processing. For instance, if a person is certain that a particular attitude toward an object is correct, then it is possible that incoming messages pertaining to the attitude object will be processed in a biased manner. Though no studies have examined the impact of attitude certainty on message processing, researchers have documented a tendency for persons with high (vs. low) emotional conviction to engage in biased processing of messages such that information that is inconsistent with one's prior stance on an issue is subject to greater scrutiny than information that is consistent with one's prior stance on the issue (Edwards & Smith, 1996; for similar studies, see Lord, Ross, & Lepper, 1979; Taber & Lodge, 2006). In the case of attitude certainty, it is possible that persons with high (vs. low) attitude certainty will engage in biased processing of incoming information that is related to the attitude object.

Specifically, persons with high attitude certainty might tend to discount information that is inconsistent with what is perceived to be the correct attitude toward an object.⁴

Overall, there are a number of reasons to expect that, as a result of engaging in extensive (as opposed to minimal) attitude-relevant thought, attitudes held with greater (as opposed to lesser) certainty will be more persistent over time and more resistant in the face of counterattitudinal attacks. Though the precise explanation for the proposed impact of thoughtinduced attitude certainty on attitudinal resistance to change is not clear, counterarguing, attitude bolstering, and message processing biases are three reasons that one might expect attitudes held with greater certainty to be more resistant to change.

Past Research on Attitude Certainty and Resistance to Persuasion

Despite the intuitive, and seemingly rational, appeal of an argument for the impact of attitude-relevant thought on attitude certainty and subsequent attitudinal resistance to persuasion, there exists a paucity of studies on the matter.⁵ In fact, to date, no studies have examined a model of resistance to persuasion that includes both attitude-relevant thought and attitude certainty. Furthermore, relatively little attention has been devoted to examining the relationships among various components of the proposed model of attitudinal resistance to persuasion. Two publications, one by Barden and Petty (2008) and one by Petrocelli and colleagues (2007), are noteworthy exceptions; each of these publications examined part of the overall model of resistance to persuasion that is proposed in this paper.

The publication by Barden and Petty (2008) examined the effects of attitude-relevant thought on attitude certainty. The results presented by these researchers provide evidence consistent with the proposition that attitude-relevant thought is positively related to attitude certainty. Barden and Petty, however, did not examine the effects of attitude certainty on

persuasion. Conversely, the publication by Petrocelli et al. (2007, Study 4), did examine the role of attitude certainty in persuasion, though this study did not induce attitude certainty via attituderelevant thought. Rather, Petrocelli and colleagues induced attitude certainty by providing bogus feedback about each subject's pretest attitude. Subjects were informed that most other students (for the high certainty induction) or few other students (for the low certainty induction) expressed attitudes in agreement with the subject's attitude. After receiving this false consensus feedback, a persuasive message was presented and posttest attitudes were measured. The data provided evidence consistent with the intended effects; high (versus low) consensus feedback was related to perceptions of greater attitude correctness, which subsequently predicted attitude certainty. The researchers also found evidence that perceptions of greater (lesser) attitude correctness were associated with less (more) attitude change in response to the persuasive message.

Although Petrocelli and colleagues (2007) found that social consensus information influenced attitude certainty, the bogus consensus feedback also introduced unintentional minority versus majority group differences between subjects who received high versus low certainty inductions. Specifically, to the extent that high consensus information implies that a person is part of a majority (opinion group), subjects who received high consensus information (i.e., the high certainty induction) were given majority group status and, thus, the counterattitudinal message presented a minority group opinion. Receipt of low consensus information (i.e., the low certainty induction), however, implies that a person belongs to a nonmajority (i.e., minority) opinion group. Therefore, subjects who received low consensus information were given minority group status and it is possible that these subjects inferred that the counterattitudinal message represented the majority group opinion. The potential

implications of the unintended difference in majority versus minority status of the message advocacy is important, particularly when viewed in light of research on the impact of majority versus minority group influence in persuasion. Indeed, a sizable literature on majority and minority group influence provides evidence of differential suasory effects of messages that advocate majority versus minority opinions (e.g., Axsom, Yates, & Chaiken, 1987; de Dreu & de Vries, 1993; Martin & Hewstone, 2003). Such research suggests that messages with majority (as opposed to minority) support tend to provoke thoughts that focus on "verification and justification rather than falsification" (p. 647, de Dreu & de Vries, 1993). Furthermore, perhaps as a result of biased processing, messages advocated by majority groups tend to be more persuasive than messages advocated by minority groups (e.g., Axsom et al., 1987; Martin & Hewstone, 2003). Given these findings, it is possible that the observed differences in persuasion reported by Petrocelli et al. (2007) are attributable to minority versus majority influence effects rather than to high versus low attitude certainty.

This Study

Given the paucity of research on attitude-relevant thought, attitude certainty, and resistance to persuasion, an experiment was designed to address this gap in the literature. The experiment was designed with two primary aims. The first aim was to replicate past research on the relationship between attitude-relevant thought and attitude certainty. In line with Barden and Petty's (2008) findings, it was predicted that engaging in attitude-relevant thought (vs. not engaging in attitude-relevant thought) would be associated with higher levels of attitude certainty.

The second aim of this study was to extend previous investigations of resistance to persuasion by examining the role of thought-induced attitude certainty in resistance to persuasive

appeals. This study utilized attitude-relevant thought to induce attitude certainty as a means to address the confound between attitude certainty and majority versus minority influence effects that was identified in Petrocelli et al.'s (2007) study of resistance to persuasion. It was predicted that attitude certainty would moderate the amount of attitude change in response to a counterattitudinal persuasive message such that persons with high attitude certainty will change less than persons with low attitude certainty (see Figure A1).

In sum, an experiment was designed to examine whether attitudes formed on the basis of extensive (as opposed to minimal) thought are more resistant to change in the face of persuasive attacks due to the certainty with which such attitudes are held. To this end, the experiment varied whether or not attitude-relevant thought preceded measurement of pretest attitudes. Attitudes that formed after engaging in (versus not engaging in) attitude-relevant thought were expected to exhibit greater stability and greater resistance to change in the face of a counterattitudinal attack.

Method

Subjects

A total of 199 (143 female) subjects (*Ss*) were recruited to participate in this study using an online subject pool maintained by the Department of Communication at a large, Midwestern university. All *Ss* were offered course credit in exchange for participating. Of the 199 *Ss* who completed the pretest study, 160 (115 female) also completed the posttest study. The average age of the sample was 20.24 years, with ages ranging from 18 to 29 years. The sample was predominantly white (83.9%, n = 167), with 1% (n = 2) American Indian or Alaskan Native, 7% (n =14) black or African American, 6% (n = 12) Asian; 4.5% (n = 9) other; and 6% (n = 6) Hispanic.⁶ The majority of the *Ss* (56.8%, n = 113) reported having more than one year of college remaining before being eligible to graduate; 28.6% (n = 57) of the *Ss* reported having at least one more semester, but less than one year of college prior to graduating; and 14.6% (n = 29) of the subjects expected to graduate at the end of the current semester.

Design

An experiment was conducted to test a model of resistance to persuasion that predicts a positive relationship between attitude-relevant thought and pretest attitude certainty, which subsequently moderates the extent to which attitudes change in response to a persuasive message (see Figure A1). To test the model predictions, a 2 (attitude-relevant thought: absent, present) X 2 (persuasive message: absent, present) independent groups factorial design was employed.

Presence of attitude-relevant thought was induced by instructing *Ss* to think and to write about the focal topic (raising tuition at the *Ss*' university, MSU) for seven minutes (see *Appendix B* for the instruction induction). Rather than thinking about the focal attitude topic, *Ss* assigned to the attitude-relevant thought absent groups completed a brainstorming task on an unrelated topic (encouraging volunteering and involvement with the local community) during the allotted seven minutes (see *Appendix C* for the instruction induction).

A persuasive message was created for the purpose of this study and it was presented to *Ss* in a text format. The persuasive message advocated a tuition increase at the *Ss'* university (Michigan State University, i.e., MSU) and it focused on three primary reasons that the university should increase tuition: (a) to attract high-quality professors and researchers, (b) to allow for smaller class sizes, and (c) to increase the number of career fairs hosted at the university (for the actual message, see *Appendix D*). This topic was selected because it concerns an issue that is presumably relevant and counterattitudinal for most *Ss*. The message presented arguments that were logically sound and the message was written with a predictive frame that

focused on relatively positive outcomes that would result from a tuition increase. *Ss* in "persuasive message absent" groups did not receive the persuasive message.

Instrumentation: Focal Measures

Attitude. Six items were created to measure *Ss*' attitudes towards increasing the university's tuition. Four items used response scales that ranged from *strongly disagree* (1) to *strongly agree* (7); two items used bipolar adjective scales that were anchored by *negative / positive* and *favorable/ unfavorable*. Items were coded so that higher scores represent more positive attitudes toward raising tuition. (See *Appendix E* for the specific items used.)

Attitude Certainty. Attitude certainty was measured using five Likert-type items that were written for the purpose of this study (a list of items is provided in *Appendix F*). Response scales ranged from 1 (*strongly disagree, not at all certain, etc.*) to 7 (*strongly agree, extremely certain, etc.*). All items were scored such that higher numbers indicated greater attitude certainty.

Instrumentation: Supplemental Measures

Topic Involvement. Although the focal attitude topic (raising tuition at the *Ss*' university) was presumed to be highly involving, measures of involvement were presented to *Ss* in all conditions to assess the degree to which the topic was perceived to be involving. Eight items from Cho and Boster's (2005) outcome-relevant involvement (ORI) and value-relevant involvement (VRI) measures were modified to reflect the topic of this study (i.e., raising tuition at the *Ss*' university). Four of the items were modified to measure ORI, or the degree to which *Ss* perceived that raising tuition was relevant to their life and future outcomes. The remaining four items were modified to measure VRI, or the degree to which *Ss* perceived that their values drive the way they feel about raising tuition. All items were presented in Likert-type format, with 7-point response scales anchored by *strongly disagree* (1) and by *strongly agree* (7) and items were

scored so that higher values reflected higher levels of involvement. (A list of items and the instructions used to measure ORI and VRI are provided in *Appendix G*.)

Assessing Message Properties. To assess *Ss* ' perceptions of the persuasive message, *Ss* in "message present" groups completed items that measured perceived argument strength, perceived position advocated, and perceived credibility of the source. These measures provided descriptive information regarding perceptions of the persuasive message that might inform speculations regarding the scope of this study.

Perceived position advocated. The items used to measure attitude were modified to measure the perceived position advocated by the author of the persuasive message. *Ss* responded to six items (four Likert-type and two semantic differential-type), using 7-point response scales. Four of the response scales ranged from *strongly disagree* (1) to *strongly agree* (7) and the remaining two response scales were anchored by *negative/ positive* and *favorable/ unfavorable.* (See *Appendix H* for the specific items and the instructions used in this study.)

Perceived source credibility. Perceived source credibility was measured using a modified (shortened) version of McCroskey and Tevin's (1999) speaker competence and speaker trustworthiness scales. Perceived speaker competence was measured using four, 7-point semantic differential items anchored by *intelligent/unintelligent, inexpert/expert, informed/uninformed, incompetent/competent.* Perceived speaker trustworthiness was measured using four, 7-point semantic differential items anchored by *honest/dishonest, untrustworthy/trustworthy, unethical/ethical, phony/genuine.* (See *Appendix I* for the complete measures.)

Perceived argument strength. Perceived argument strength was measured using LaFrance and Boster's (2001) argument strength scale. This scale consisted of five, 7-point semantic differential items anchored by *convincing/unconvincing, reasonable/unreasonable,*

unsound/ sound, believable/ not believable, not plausible/ plausible. (See *Appendix J* for the complete measure.)

Procedure

An online subject pool was used to recruit *Ss* to participate in this study. The subject pool advertised the experiment as a two-part study (consisting of a pretest and a posttest) on student opinions. Approximately one week after completing the pretest portion of the study, participants received an email invitation to participate in the posttest study. The email contained instructions on how to sign up for the posttest using the online subject pool. All portions of the experiment were administered online and *Ss* could complete the study using any computer that had internet access.

Pretest. After signing up to participate in the study, all *Ss* were directed to an online consent form. Upon granting consent to participate, all *Ss* viewed a page that contained a cover story. The cover story informed *Ss* that the study was being conducted in collaboration with MSU's Student Affairs Office and it stated that the purpose of the study was to assess student opinions regarding potential upcoming changes at the university (see *Appendix K* for the cover story). After viewing the cover story, all *Ss* were assigned randomly (with the constraint of roughly equal cell sizes) to one of two initial treatment groups: (a) attitude-relevant thought present or (b) attitude-relevant thought absent.

Attitude-relevant thought present. After reading the cover story, *Ss* in "attitude-relevant thought present" groups were presented with the attitude certainty induction, which consisted of instructions for *Ss* to use the next seven minutes to think and to write about feelings and thoughts related to raising tuition at MSU (for complete instructions, see *Appendix B*). A text box was presented directly below the thought instructions and *Ss* were asked to use the text box to provide

responses, as per the instructions. After seven minutes elapsed, *Ss* were asked to respond to the focal attitude measure, the attitude certainty measure, the ORI and the VRI measures, in addition to a number of filler items. The filler items were related to MSU student affairs, extracurricular activities, and other university policies so as to disguise the true purpose of the study (examples of the filler items are presented in *Appendix L*). *Ss* also responded to the attitude certainty measure. After completing these items, *Ss* were asked to provide demographic information and they were asked to submit their university email address, which was used to inform *Ss* (approximately one week after completion of the pretest) of how to sign up to participate in the second (posttest) portion of this study.

Attitude-relevant thought absent. After reading the cover story, *Ss* who were assigned to "attitude-relevant thought absent" groups completed a seven-minute filler brainstorming task on an unrelated topic (encouraging volunteering and involvement with the local community, see *Appendix C*). Following the seven-minute task, *Ss* were asked to complete the focal attitude measure, the attitude certainty items, the ORI and VRI scales, in addition to a number of filler items designed to mask the true purpose of this study (the filler items were identical to the filler items used for *Ss* in the "attitude-relevant thought present" group). After completing these measures, *Ss* were asked to provide demographic information in addition to their university email address, which was used to inform *Ss* (approximately one week after completion of the pretest) of how to access the second (posttest) portion of this study.

Posttest. *Ss* used the online subject pool to sign up for the posttest portion of this experiment. After signing up to participate, these *Ss* were directed to an online consent form that described the study as "Part 2" of the study that they completed approximately one week ago

(i.e., the pretest). Upon indicating consent to participate, *Ss* were assigned randomly to one of two posttest groups: (a) persuasive message absent or (b) persuasive message present.

The posttest portion of the study began with an informational page that explained to *Ss* that they would be asked to read and respond to written suggestions regarding university policy proposals that were under consideration for implementation at the *Ss*' university (see *Appendix M*). All *Ss* then read and responded to a short filler message regarding a policy that would require university faculty to carry their university identification cards with them at all times.

Persuasive message absent. After reading and responding to the filler message topic, *Ss* in "message absent" groups completed the focal attitude items, the attitude certainty measure, and filler items. Following completion of these items, *Ss* in "message absent" groups were debriefed and thanked for their participation.

Persuasive message present. After reading and responding to the filler message topic, *Ss* in the "message present" groups were presented with the target persuasive message that advocated raising tuition at MSU. After reading the message, *Ss* completed the posttest attitude items, the attitude certainty scale, and items designed to assess properties of the persuasive message (perceived position advocated, perceived argument strength, and perceived source credibility). *Ss* were also presented the filler items. Upon completing these items, *Ss* were debriefed and thanked for their participation.

Results

Measurement Model

The structure of the measured variables was assessed by performing separate confirmatory factor analyses (CFA, Hamilton & Hunter, 1988; see also Hunter & Gerbing, 1982) for the pretest measures and posttest measures. A separate CFA was also performed for the

measures that assessed perceived properties of the persuasive message (i.e., perceived position advocated, perceived argument strength, speaker competence, and speaker trustworthiness).

Internal consistency and external consistency of the measures were assessed using Hamilton and Hunter's (1988) CFA software. Factors were specified for each of the focal and primary filler measures and nine-factor solutions were tested for the pretest and for the posttest separately, with the following constraint: variables measured on both pretest and posttest surveys had to contain identical items to allow for direct comparison of pretest and posttest scores. After discarding a number of items (including one item from the attitude measure and one item from the attitude certainty measure), satisfactory model fit was obtained for the pretest (RMSE = .05) and for the posttest (RMSE = .08). Factor loadings for the focal measures are presented in Table 1 (pretest) and Table 2 (posttest) of *Appendix N*.

The structure of the measures used to assess perceptions of the persuasive message was also examined using CFA. A four-factor solution was tested, with the constraint that the measure of perceived position advocated contain the same items as the pretest and posttest attitude measures to allow for direct comparison of the perceived position advocated relative to the subjects' attitudes. After dropping one item from the perceived message advocacy measure (to match the items on the pretest and posttest attitude measures) and one item from the perceived argument strength measure, satisfactory fit was obtained (RMSE = .06). Factor loadings for these measures are presented in Table 2 of *Appendix N*.

When satisfactory model fit was obtained for pretest, posttest, and tuition message and source perception measures, scores on the retained items for a given variable were averaged to form a single index, with higher scores indicating more favorable attitudes or greater amounts of the variable being measured. The remaining analyses were conducted using these indices.

Pretest Results

Involvement with the Attitude Topic. On average, increasing tuition at the *Ss*' university was a moderately to highly outcome-involving topic. The mean of the ORI index was 5.24 (SD = 1.75, mode = 7), with scores ranging from 1.00 to 7.00. A one-sample *t*-test provides evidence that the mean of the ORI index differed significantly from the midpoint of the scale, t(194) = 9.92, p < .001. The distribution of the ORI measure was skewed negatively and mesokurtic; both standardized item alpha (SIA) and Cronbach's $\alpha = .93$. There is no evidence that ORI differed between the "attitude relevant thought absent" group (M = 5.17, SD = 1.76) and the "attitude-relevant thought present" group (M = 5.32, SD = 1.75), t(193) = -0.59, d = -.08, r = .04, p = .554.

Ss also tended to report moderate amounts of value-relevant involvement. Scores on the VRI measure ranged from 1.00 to 7.00, with a mean of 3.9 (SD = 1.53, mode = 4). There is no evidence that the mean of the VRI index differed significantly from the midpoint of the scale, t(190) = -0.89, p = .376. The distribution of the VRI index was not skewed substantially and the distribution was mesokurtic; SIA = .89 and Cronbach's $\alpha = .90$. There was a tendency for Ss in the "attitude relevant thought absent" group to report lower VRI (M = 3.70, SD = 1.35) than Ss in the "attitude-relevant thought present" group (M = 4.09, SD = 1.67), though the difference did not reach conventional levels of statistical significance, t(188) = -1.80, d = -.26, r = .13, p = .073.

Pretest Attitudes. Pretest attitudes toward increasing tuition were relatively unfavorable (M = 2.03, SD = 1.00, mode = 1). A one-sample *t*-test indicated that the mean of the pretest attitude measure differed significantly from the midpoint of the scale, t(183) = -26.70, p < .001. Scores on the pretest attitude measure ranged from 1.00 to 5.20 and the distribution of this measure was skewed positively and mesokurtic, with SIA = .87 and Cronbach's α = .85. An

independent samples *t*-test was performed to examine whether the attitude certainty induction affected unintentionally pretest tuition attitudes. Pretest tuition attitudes for *Ss* in the "attitude relevant thought absent" group (M = 1.90, SD = .93) did not differ significantly from pretest tuition attitudes for *Ss* in the "attitude-relevant thought present" group (M = 2.15, SD = 1.06), t(181) = -1.68, d = -.25, r = .12, p = .094. Thus, there is no evidence that the attitude certainty induction affected pretest attitudes. It is worth noting, however, that pretest attitudes were correlated with pretest attitude certainty, uncorrected r(176) = -.45, p < .001. When corrected for attenuation due to measurement error, the correlation between pretest attitudes and pretest attitude certainty was -.52, 95% CI [-.65, -.38].

Effectiveness of the Pretest Attitude Certainty Induction. Scores on the pretest attitude certainty measure ranged from 1.00 to 7.00. The distribution of the attitude certainty index was skewed negatively and mesokurtic, with a mean of 5.18 (SD = 1.30, mode = 7), both SIA and Cronbach's $\alpha = .87$. On average, pretest attitude certainty was moderate both for *Ss* in the "attitude relevant thought absent" group (M = 5.26, SD = 1.25) and for *Ss* in the "attitude-relevant thought present" group (M = 5.09, SD = 1.36). One-sample *t*-tests provide evidence that both of the group means were above the midpoint of the scale, "attitude-relevant thought absent" group: t(90) = 9.63, p < .001; "attitude-relevant thought present" group: t(96) = 7.98, p < .001. Furthermore, there was no evidence that engaging in attitude-relevant thought affected pretest attitude certainty, t(186) = 0.84, d = .12, r = .06, p = .401. Thus, the attitude certainty induction did not have the intended effect.

Posttest Results

Attrition. Of the 199 *Ss* who completed the pretest study, 160 *Ss* also completed the posttest study. Independent samples *t*-tests were performed to assess potential group differences

between those subjects who completed both a pretest and a posttest versus those subjects who completed only a pretest. The results of the analyses are presented in Table 3 of *Appendix N*. For all but one variable, ORI, the differences between groups were not substantial. Subjects who completed only a pretest reported lower ORI (M = 4.74, SD = 1.96) than those who subjects who completed both a pretest and a posttest (M = 5.36, SD = 1.68), t(193) = -2.00, d = -.29, r = -.14, p = .047. It is worth noting that if a Bonferroni correction is applied to account for the number of statistical tests performed, then the mean difference between groups on the ORI index is not significant statistically.

Pretest-Posttest Latency. Latency between the pretest and posttest ranged from 7 to 49 days. The distribution of pretest-posttest latency was skewed positively and leptokurtic, with a mean of 12.33 days (SD = 8.31, mode = 7, median = 8). Of the 160 Ss who completed both a pretest and a posttest, 123 Ss (76.9%) completed the posttest within 7-14 days of the pretest.

Assessing Baseline Comparability of Posttest Groups. Independent samples *t*-tests were performed to compare pretest attitudes, pretest attitude certainty, ORI, and VRI for subjects who were assigned to the "persuasive message absent" and the "persuasive message present" posttest groups (see Table 4 of *Appendix N* for means and standard deviations of the groups). The results of these analyses do not provide evidence of between group differences on pretest attitudes, t(146) = -0.44, d = -.07, r = -.04, p = .659; attitude certainty, t(149) = 1.79, d = .29, r = .15, p = .075; ORI, t(155) = 1.28, d = .21, r = .10, p = .203; or VRI, t(150) = 1.10, d = .18, r = .09, p = .275.

Distribution of Posttest Attitudes. Posttest attitudes toward increasing tuition were relatively unfavorable (M = 2.35, SD = 1.22, mode = 1.00). Scores on the posttest attitude

measure ranged from 1.00 to 6.00; the distribution of this measure was skewed positively and mesokurtic, with SIA = .88 and Cronbach's α = .87.

Tuition attitude change scores were computed by subtracting pretest attitude scores from posttest attitude scores. Tuition attitude change scores ranged from -2.40 to 5.00. The distribution of tuition attitude change scores was skewed positively and leptokurtic, with a mean of .31 (SD = 1.10, median = 0). The estimated reliability of tuition attitude change was Cronbach's $\alpha = .75$.On average, attitude change scores differed statistically from zero, t(143) = 3.37, p = .001.

In addition, a dichotomous variable for attitude change was created to indicate whether or not attitudes changed (disregarding the direction of change). Scores on the dichotomous change variable ranged from 0.00 to 1.00, with a mean of .81 (SD = .39, mode = 1.00). The distribution of dichotomous change was skewed negatively and mesokurtic. A total of 117 out of 144 *Ss* had non-zero tuition attitude change scores. It is worth noting that of the 72 *Ss* who received a persuasive message and who completed both a pretest and a posttest attitude measure, 42 *Ss* changed their attitude toward the perceived position advocated by the message, 21 *Ss* changed their attitude away from the perceived position advocated in the message, and 9 *Ss* reported the same attitude at pretest and at posttest.

Perceptions of the Persuasive Message. Overall, those who received the persuasive message perceived that the message advocated a relatively favorable stance toward increasing university tuition (M = 5.72, SD = 1.51, mode = 7.00, range: 1.20 to 7.00). The distribution of this index was skewed negatively and leptokurtic, with both SIA and Cronbach's $\alpha = .97$. Additionally, *Ss* perceived that the arguments presented in the persuasive message were moderate in strength, with a mean of 4.49 (SD = 1.18, mode = 4.00, range = 1.00 to 7.00). The

distribution of the argument strength index was skewed negatively and leptokurtic, with both SIA and Cronbach's α = .89. *Ss* generally perceived that the source of the persuasive message was moderately competent (*M* = 4.75, *SD* = 1.26, mode = 5.00, range = 1.00 to 7.00) and moderately trustworthy (*M* = 4.65, *SD* = 1.24, mode = 4.00, range = 1.00 to 7.00). The distributions of the perceived source competence and perceived source trustworthiness indices were skewed negatively and leptokurtic, with both SIA and Cronbach's α = .93 for the source competence measure and both SIA and Cronbach's α = .94 for the source trustworthiness measure.

Effects of the Pretest and Posttest Inductions on Attitudes. The effects of the attitude certainty induction and the persuasive message induction on posttest attitudes were assessed (a) using ANOVA on attitude change scores, with the attitude certainty induction and the message induction entered as fixed factors, (b) using ANCOVA on posttest attitude scores with pretest attitude scores entered as a covariate and with the attitude certainty induction and the message induction entered as fixed factors, and (c) performing hierarchical logistic regression with dichotomous change regressed on the attitude certainty induction and the message induction.

When ANOVA was conducted on attitude change scores, with the attitude certainty induction and message induction entered as fixed factors, the message induction was the only statistically significant effect, F(1, 140) = 8.90, p = .003, $\eta^2 = .06$. On average, subjects who received a persuasive message changed more (M = .58, SD = 1.17) than subjects who did not receive a persuasive message (M = .04, SD = .97). Neither the main effect of the certainty induction, F(1, 140) = 1.20, p = .275, $\eta^2 = .01$, nor the interaction effect, F(1, 140) = 0.29, p = .592, $\eta^2 = .00$, were significant statistically.⁷

When ANCOVA was performed on posttest attitudes with pretest attitudes entered as a covariate and with the attitude certainty induction and the persuasive message induction entered as fixed factors, there was a statistically significant effect of the covariate F(1, 139) = 48.22, p < .001, partial $\eta^2 = .26$. There was also evidence of a main effect of the message induction, F(1, 139) = 10.99, p = .001, partial $\eta^2 = .07$. The certainty induction main effect did not reach conventional levels of statistical significance, F(1, 139) = 3.06, p = .083, partial $\eta^2 = .02$; and there was no evidence of an interaction effect, F(1, 139) = 0.02, p = .884, partial $\eta^2 = .00$.

Prior to conducting the logistic regression analysis with dichotomous attitude change as the criterion, the attitude certainty induction and persuasive message induction variables were dummy coded (0, 1), with absence of attitude-relevant thought and absence of message coded, respectively, as reference groups. Next, an interaction term was created using the centered variables. Both of the first-order predictors were entered in block 1 and the interaction term was entered in block 2 of the hierarchical logistic regression analysis. When the overall model was compared to a constant-only model, the overall model was not significant, χ^2 (df = 3) = 3.90, p = .273, -2LL = 135.09, Cox and Snell R^2 = .027, indicating that the variables in the model did not distinguish between subjects with attitude change and subjects with no attitude change. Furthermore, there was no evidence that the first-order predictors entered in block 1 of the analysis improved prediction of dichotomous attitude change compared to a constant-only model, χ^2 (df = 2) = 3.76, p = .152, -2LL = 135.22, Cox and Snell R² = .026. Thus, there is no evidence that the message induction or the attitude certainty induction aided in the prediction of whether or not attitudes changed.

Effects of Pretest Attitude Certainty and the Persuasive Message on Attitude

Change. Hierarchical multiple regression was performed to test more precisely the hypothesis that pretest attitude certainty would moderate the degree to which attitudes change in response to a persuasive message. Prior to performing the regression analyses, the persuasive message variable was dummy coded, with "message absent" set as the reference group, the predictor variables were mean-centered to reduce multicollinearity (Cohen, Cohen, West, & Aiken, 2003), and a product term was created to test the predicted interaction effect. Cohen et al. (2003) suggest that variance inflation factor (VIF) statistics above 10 can indicate serious threat of multicollinearity; VIF for this study was 1.02, which is well below that which would be expected when multicollinearity poses a serious threat.

When the centered attitude certainty and dummy persuasive message variables were entered in the first block and the interaction between these variables was entered in the second block of the analyses, the results indicate that the overall model for predicting attitude change did not reach conventional levels of statistical significance, F(3, 135) = 2.28, p = .083, R = .22, adjusted $R^2 = .03$. Further examination of the results indicated that the effect of the interaction term was far from substantial, b = .05, t = 0.34, p = .733; therefore, the data do not provide evidence consistent with the hypothesis that attitude certainty moderates the degree to which attitudes change in response to a persuasive message. Variables entered in block 1 of the analyses, however, contributed significantly to the prediction of attitude change, F(2, 136) =3.38, p = .037, R = .22, adjusted $R^2 = .03$. Specifically, the first-order effect of pretest attitude certainty was not significant, b = .03, $\beta = -.03$, t = -0.36, p = .717; therefore, there was no evidence that pretest attitude certainty predicts the degree to which attitudes change in response to a persuasive message. The first-order effect of the persuasive message, however, was significant statistically, b = .46, $\beta = .21$, t = 2.50, p = .014, indicating that receipt of a persuasive message did contribute to attitude change. Those who received a persuasive message tended to have more positive attitude change than those who did not receive a persuasive message, though the size of the correlation between receipt of a persuasive message and attitude change was not large, $r_{pb}(144) = .24$, p = .004; after correcting for attenuation due to measurement error, r = .27, 95% CI [.10, .45].

Next, hierarchical logistic regression was performed to examine whether or not pretest attitude certainty moderated the relationship between receipt of a persuasive message and attitude change measured dichotomously. The first-order predictors (centered attitude certainty and dummy centered message induction) were entered in block 1 and the interaction term was entered in block 2 of the analysis. A comparison test of the overall model versus a constant-only model was significant statistically, χ^2 (df = 3) = 14.42, p = .002, -2LL = 116.56, Cox and Snell $R^2 = .10$, indicating that the model variables in the model improved prediction of dichotomous attitude change (compared to exclusion of the variables). Using the Wald statistic to assess the contribution of the individual predictors suggests that the interaction effect between attitude certainty and receipt of a persuasive message was not significant statistically, B = -.06, S.E. = .44, Wald statistic = 0.02, p = .893, indicating that the interaction term did not contribute substantially to predicting whether or not subjects' attitudes changed. The first-order effect of the message induction also was not significant, B = .70, S.E. = .54, Wald statistic = 1.66, p = .198, suggesting that receipt of a persuasive message did not contribute substantially to whether or not subjects' attitudes changed. The first-order effect of attitude certainty, however, was significant statistically, B = -.68, S.E. = .22, Wald statistic = 9.28, p = .002. The odds ratio for attitude

certainty was .51, 95% CI [.33, .79], indicating that subjects who were more certain of their attitudes at the pretest were 49% less likely to exhibit attitude change. The correlation between pretest attitude certainty and dichotomous attitude change was $r_{pb}(139) = .28$, p = .001. Overall, the results of the logistic regression analysis do not provide evidence consistent with the prediction that attitude certainty would moderate attitude change in response to a persuasive message. The results, however, provide some evidence of an inverse relationship between pretest attitude certainty and presence/ absence of attitude change.

Discussion

An experiment was designed to replicate and extend previous research on the relationships between attitude-relevant thought, attitude certainty, and resistance to persuasion. Prior to this experiment, there existed one publication, by Barden and Petty (2008), on the relationship between attitude-relevant thought and attitude certainty. It was expected that this study would replicate Barden and Petty's findings, which suggested that engaging in attituderelevant thought tends to increase attitude certainty. Another publication, by a different team of researchers (Petrocelli et al., 2007), had attempted to examine the role of attitude certainty in resistance to persuasion. Petrocelli and colleagues concluded that attitudes held with greater certainty tend to be more resistant to change; however, the attitude certainty induction in their study was confounded with minority versus majority influence effects. This study used a different method to induce attitude certainty in order to eliminate the potential confound between attitude certainty and minority versus majority influence effects, though it was expected that attitude certainty would still moderate the degree to which attitudes change in response to a persuasive message. Contrary to the predictions, the results of this experiment do not provide evidence consistent with the notion that engaging in attitude-relevant thought increases attitude

certainty. Furthermore, the data are inconsistent with the conclusions drawn by Petrocelli et al. (2007) regarding the role of attitude certainty in resistance to persuasive appeals. Rather, this study found no evidence that attitude certainty moderated the degree to which attitudes changed in response to a persuasive message. Although this study also found no evidence of a relationship between pretest attitude certainty and the amount that attitudes change, there was some evidence of an inverse relationship between pretest attitude certainty and the mere presence of attitude change (compared to no change). Additionally, this study found a positive relationship between receiving a persuasive message and attitude change.

Although it is unclear why attitude-relevant thought did not predict attitude certainty in this study, it is possible that mere thought is insufficient to increase attitude certainty. Rather, the content of the thoughts generated during attitude-relevant elaboration could be a primary determinant of the degree to which attitudes are held with certainty. For instance, it is possible that the distribution of one's thoughts along an attitude continuum will influence the extent to which one feels certain about an attitude. Specifically, generating multiple univalent thoughts (e.g., all "pro abortion" or all "anti gun control") might lead to greater certainty than generating the same number of mixed-valence thoughts (e.g., a mixture of "pro abortion" and "anti abortion" thoughts or a mixture of "pro gun control" and anti gun control" thoughts). If it is the case that the content of thoughts matters, then one potential explanation for the lack of group differences in attitude certainty for this study could be that subjects tended to generate thoughts that were mixed-valence during the attitude-relevant thought task. Another potential explanation for the lack of group differences in attitude certainty could relate to the subjects' experience during the attitude-relevant thought task. Specifically, the thought task required that Ss think about the focal attitude topic for seven minutes. Although this amount of time was presumed to

be long enough to provide a strong induction, the time duration was not pretested and there are at least two potential caveats to requiring a seven-minute task. First, although the instruction induction stated explicitly the importance of Ss using the entire seven minutes to complete the task, the online nature of the experiment precluded observation or enforcement of this request. Therefore, there exists the possibility that Ss engaged in alternative tasks during all, or part, of the attitude-relevant thought task. Alternatively, it is possible that Ss ran out of novel thoughts partway through the seven minute task – in which case, it is possible that Ss might have perceived that they were less knowledgeable or less thoughtful on the topic in comparison to others who might use the full seven minutes to create arguments or to generate novel ideas related to the attitude topic. Future studies might pretest to optimize the duration of the thought task. It is also worth noting that the effectiveness of the induction could be attributable to the topic used in this study; future research might profit from examining topics for which attitudes and attitude certainty are distributed normally. Examination of the mechanisms driving the purported relationship between attitude-relevant thought and attitude certainty are also warranted.

Although the attitude certainty induction in this study did not have the intended effect, it was still possible to examine the relationship between attitude certainty and attitudinal resistance to change. That this study failed to replicate the conclusions drawn by Petrocelli and colleagues (2007) regarding the role of attitude certainty in resistance to persuasion warrants attention. Although the findings of this study or of Petrocelli et al.'s study could be attributable to a number of factors, one possibility is that the discrepant results are attributable to the majority versus minority influence confound that was identified in the study conducted by Petrocelli and colleagues. In any case, the results of this experiment do not provide evidence of a relationship

between attitude certainty and attitude change. Future studies might attempt to induce attitude certainty and minority/ majority influence effects to examine the relative effects of these predictors in accounting for resistance to change in the face of persuasive messages.

Lastly, the results of this study suggest attitudes held with greater certainty tend to be more stable than attitudes held with lesser certainty. This finding is consistent with the results of a previous study (Bassili, 1996) that employed a correlational design to study, among other things, the relationship between attitude certainty and attitude stability over time. That attitudes held with greater certainty are less likely to change has interesting implications for practitioners. For instance, anti-drug programs such as D.A.R.E. might benefit from incorporating elements that increase certainty in the desired anti-drug attitudes as a means to increase the stability of attitudes over time. Additional studies on attitude certainty might consider employing longitudinal designs that track attitude change and attitude stability over time to understand more fully the relationship between these variables.

Overall, despite failure to obtain evidence consistent with the proposed model of resistance to change, the findings suggest that attitude certainty might have implications for researchers and practitioners who are interested in attitude stability and the findings provide a springboard for future research on the roles of attitude-relevant thought and attitude certainty in attitudinal resistance to change.

Footnotes

¹ Hunter et al. (1976) proposed a similar argument regarding the interrelated structure of attitudes. These researchers, however, posited that attitudes are organized logically within hierarchical systems that are composed of attitudes toward relatively abstract concepts at higher levels of the hierarchy and attitudes toward specific or concrete concepts at lower levels of the hierarchy. Due to the logical relations between attitudes in hierarchical systems, attitudes within a given hierarchy have the potential to influence one another. Specifically, the model stipulates that within a given hierarchy, there exists top-down influence such that superordinate attitudes exert influence on attitudes that exist at lower levels of the attitude hierarchy. As a result of top-down influence, lower-level attitudes become aligned with superordinate attitudes, thus creating a system of attitudes that are consistent with one another when the system is at equilibrium. To the extent that greater contemplation of an attitude object results in a greater number of connections between the attitude object and related attitudes, thus embedding the focal attitude in a hierarchical system, one would expect that thinking extensively about an attitude object would result in greater stability over time and greater resistance to change.

² Bassili (1996) reported evidence consistent with the proposition that attitudes held with greater (as opposed to lesser) certainty are more stable over time. Bassili's study, however, did not induce attitude certainty experimentally and it did not examine the role of attitude-relevant thought in the stability of attitudes over time.

³ It is also possible that engaging in attitude-relevant thought increases the likelihood that a connection will be made between one's attitude and one's superordinate values. Specifically, it is likely that engaging in greater attitude-relevant thought increases the probability of

acknowledging that one's attitude is congruent with one's values and that holding any other (opposing) attitude would be incongruent with one's values. If this is the case, then one might anticipate that engaging in attitude-relevant thought will result in greater stability and resistance to change as a result of cognitions generated in response to external messages (Hunter et al., 1976).

⁴ Selective exposure to information that is consistent with one's opinions (e.g., Hyman & Sheatsley, 1947; Jonas, Schulz-Hardt, Frey, & Thelen, 2001) is another mechanism that could explain why attitudes held with greater certainty might be stable over time and resistant to change. The notion of selective exposure to information, however, is deemed tangential to the primary focus of this paper on the role of attitude-relevant thought as a precursor to attitude certainty.

⁵ Despite the dearth of research regarding the role of attitude certainty in resistance to persuasion, some published articles have claimed that evidence for such a relationship exists (e.g., Tormala & Rucker, 2007). Upon reading the research that supposedly provides evidence for such a relationship, it is evident that although the studies examined confidence (i.e., certainty) in various judgments, the bulk of the studies fall short of examining the role of attitude certainty in resistance to persuasive attempts. Rather, the studies often examine confidence in relation to non-attitudinal judgments and the studies do not examine attitude or opinion change in response to counterattitudinal messages. For instance, previous studies have examined susceptibility of performance assessments (grading homework assignments) to inaccurate information about the person whose performance is assessed (Babad, Ariav, Rosen, & Salomon, 1987); susceptibility to conforming when judgments are made public within small groups (Kelley & Lamb, 1957); and susceptibility of responses to question framing effects (Swann, Pelham, & Chidester, 1988).

⁶ The reader might note that the total of these percentages exceeds 100% - this is attributable to a small percentage of subjects who identified with multiple ethnic categories (5%, n = 9 of the sample identified with 2 ethnicities; 1%, n = 2 identified with 3 ethnicities, 1 subject did not provide information regarding ethnicity).

⁷ All of the reported analyses that include attitude change as the dependent or criterion variable were also performed using the absolute value of attitude change instead of attitude change as the dependent or criterion variable. The results of all of the analyses did not change substantially, so only the results for attitude change are presented.

APPENDICES

Appendix A

Figure 1. Proposed model of resistance to persuasion



Figure 1. Attitude-relevant thought was expected to increase pretest attitude certainty, which was subsequently expected to moderate the degree to which attitudes changed in response to a counterattitudinal message.

Appendix B

Attitude-Relevant Thought "Present" Induction

Brainstorming Instructions: Increasing Tuition (focal attitude topic)

We would like to begin by asking for your personal insight via a brainstorming task. For this brainstorming task, we would like you to think about a proposal to increase student tuition in order to ameliorate MSU's current financial crisis. Please consider both potential positive and potential negative thoughts and feelings related to the proposed tuition increase. For instance, you might generate arguments in favor of raising tuition in addition to arguments against raising tuition. You might also think about potential ways that the proposed tuition increase will impact you, other students, faculty and staff at MSU. MSU's Student Affairs Office will use your written responses as feedback regarding the proposed tuition increase, so it is very important that you think carefully about the topic.

In the space provided below, please write about all of the potential pros and cons that you can think of that relate to raising MSU's tuition. You will have 7 minutes to think and write about your thoughts and feelings toward increasing MSU's tuition. Because you are one of the select students that will be providing feedback to the university regarding the proposed tuition increase, it is important that you please use the entire time to think and to write.

Appendix C

Attitude-Relevant Thought "Absent" Induction

Brainstorming Instructions: Encouraging Volunteering and Community Involvement (unrelated to the focal attitude topic)

We would like to begin by asking for your personal insight via a brainstorming task. For this brainstorming task, we would like you to think about a ways to increase volunteering and community involvement. Please consider ideas that might increase or encourage volunteering on a regular basis (i.e., on a weekly or monthly basis) as well as ideas that might increase or encourage volunteering for one specific event or volunteer opportunity. You might also think about potential ideas that would be ineffective in terms of increasing volunteering and community involvement. MSU's Student Affairs Office will use your written responses as feedback for ways to increase volunteering and community involvement in East Lansing, so it is very important that you think carefully about the topic.

In the space provided below, please write about all of the potential pros and cons that you can think of that relate to encouraging volunteering and involvement with the community. You will have 7 minutes to think and write about your thoughts and feelings. Because you are one of the select students that will be providing feedback to the university regarding ideas to encourage volunteering and community involvement, it is important that you please use the entire time to think and to write.

Appendix D

Persuasive Message

INTRO: As harsh economic times continue to affect Michigan State University, it has become clear that MSU must make some drastic changes in order to remain a respected Big Ten university. At present, the university has four sources of incoming funds: (1) donations, (2) tuition, (3) grants and other contracts, and (4) state funding. Despite the recent increase in grant funding obtained, MSU is facing an unprecedented financial burden as a result of reaching an all-time low in donations. This unabated financial crisis will soon result in deterioration of academic quality if it is left unaddressed. Taking into account all elements of MSU's financial situation, it is clear that it would be in the students' best interest for MSU to raise tuition rates as soon as possible. By raising tuition rates at MSU, the university will be able to continue to attract high-quality professors and researchers, MSU will be able to maintain its ability to host career fairs throughout the year, and students will benefit from smaller class sizes.

The first reason that MSU should increase tuition is because raising tuition would create high salary incentives for university faculty. Offering sizable salary incentives has the potential to attract proficient instructors and skilled researchers to work at this institution and a recent report from the Institute for Higher Education provides empirical support for this relationship. The report indicates that there is a tendency for institutions offering large salaries to employ high quality faculty. Employing highly qualified instructors and highly skilled researchers is important because it largely determines the quality of a student's university education. Furthermore, attracting skilled researchers to join MSU faculty will likely lead to an increase in

grant funds received by the university, which could eliminate the need for larger tuition increases in the future.

The second reason that MSU should increase university tuition is because raising tuition would allow the university to continue to devote money to offering smaller recitation sections to accompany many large lecture halls and it would also allow the university to continue offering a selection of upper-level courses with smaller class sizes instead of solely offering large lecture courses. According to an article in the May 2010 edition of the MSU College of Education New Educator Magazine, providing small group classes can maximize successful learning in classroom educational settings. Providing small class sizes is critical because offering small classes produces a high level of student-faculty interaction, which clearly results in a higher quality education.

The third reason that MSU should increase tuition is because it would allow the university to set aside money for hosting career fairs throughout the year. In a recent interview, the dean of the college stated that career fairs provide students with valuable educational opportunities to hone their professional networking skills and to practice interacting in professional settings. Clearly, providing opportunities for students to practice networking and interacting in professional settings will result in an increase in the overall quality of the education provided by an institution.

SUMMARY: Thus, because raising tuition at MSU will have a positive impact on employing high-quality professors, because it will allow the university to continue to offer smaller class sizes, and because it will allow the university to continue hosting career fairs, it is clear that raising MSU's tuition is in the best interest of the students enrolled at the university.

CONCLUSION: Therefore, students should support MSU increasing tuition if they want to continue to receive a high quality education.

Appendix E

<u>Attitudes</u>

Instructions: The following questions relate to your opinion regarding increasing tuition at MSU. For each of the questions, choose the one number (1-7) that best represents the extent to which you agree or disagree with the statement presented.

1. I feel that increasi	ng MS	U's tui	tion wo	uld be a	good io	dea.		
Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
*2. I think that increa	asing N	ASU's	tuition i	s a wor	thless su	uggestic	on.	
Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
3. I think that increase	sing M	SU's tu	iition is	a wise	suggest	ion.		
Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
4. I feel that increasi	ng MS	U's tui	tion wo	uld be a	bad ide	ea.		
Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
5. Overall, I feel that	increa	using tu	ition at	MSU w	ould be	·		
Negative	1	2	3	4	5	6	7	Positive
6. Overall, I feel that	increa	using tu	ition at	MSU w	ould be	·		
Favorable	1	2	3	4	5	6	7	Unfavorable

*Items marked with an asterisk were dropped to obtain satisfactory fit of the measurement model.

Appendix F

Attitude Certainty

Directions: Please read each of the following statements carefully. For each question, choose the answer option that best represents your response to the question or statement provided.

1. Given all of the positives and negatives related to increasing MSU's tuition, how confident are you that of all the possible attitudes one might have, your attitude reflects the right way to think and feel about raising MSU's tuition? 2 3 4 5 6 7 Not at all confident 1 Extremely confident 2. In light of all of the pros and cons regarding raising MSU's tuition, how certain are you that your attitude toward increasing MSU's tuition is the correct attitude to have? 3 5 Not at all certain 1 2 4 6 7 Extremely certain *3. Given the advantages and disadvantages of increasing MSU's tuition, how likely is it that your opinion regarding whether or not MSU should raise tuition is an incorrect opinion to have toward the issue? 2 3 5 Not at all certain 1 4 6 7 Extremely certain

4. Given all of the positives and negatives related to increasing MSU's tuition, please indicate your agreement with the following statement: "The opinion that I reported toward raising tuition at MSU is definitely the correct attitude to have."

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

5. In light of all of the pros and cons regarding raising MSU's tuition, please indicate your agreement with the following statement: "I have no doubt that my attitude toward increasing tuition at MSU is the correct attitude to have."

Strongly disagree	1	2	3	4	5	6	7	Strongly agree
			-		-	-		0,0

*Items marked with an asterisk were dropped to obtain satisfactory fit of the measurement model.

Appendix G

<u>ORI/VRI</u>

Instructions: The following questions pertain to your feelings regarding raising tuition at MSU. For each of the questions, select the number (1-7) that best represents the extent to which you agree or disagree with the statement presented. Please read each item carefully and respond accordingly.

*1. Whether MSU increases the cost of tuition or not has little impact on my life. Strongly Disagree Strongly Agree *2. All in all, the effect of raising tuition costs at MSU on my life is small. Strongly Disagree Strongly Agree *3. Raising tuition costs at MSU will have little effect on me. Strongly Disagree Strongly Agree *4. My life would not change much if MSU were to increase tuition. Strongly Disagree Strongly Agree 5. Knowing my position on increasing MSU's tuition is central to understanding the kind of person I am. Strongly Disagree Strongly Agree 6. My position on raising tuition at MSU is based on the values with which I try to conduct my life. Strongly Disagree Strongly Agree 7. The arguments for or against increasing MSU's tuition are relevant to the core principles that guide my life.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
8. My beliefs about 1	how I s	should l	ive my	life det	ermine	my posi	ition on	raising tuition at MSU.
Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree

* Items marked with an asterisk were used to measure ORI. Items not marked with an asterisk were used to measure VRI.

Appendix H

<u>Perceived Position Advocated:</u>

Instructions: The following questions pertain to all of the information provided by the author of the proposal that you just read regarding increasing MSU's tuition. <u>Imagine that you are the author of the proposal</u> that you just read and answer the following questions according to <u>how you think the author would respond</u>.

For each of the questions, circle only one number (1-7) that best represents how much you think the **author of the proposal** would agree or disagree with the statement.

1. The author feels th	nat incre	easing N	MSU's t	uition	would b	be a goo	od idea.	
Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
*2. The author thinks	s that in	creasin	g MSU	's tuiti	on is a v	vorthle	ss idea.	
Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
3. The author thinks	that inc	reasing	MSU's	tuition	n is a wi	ise sug	gestion.	
Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
4. The author feels th	nat incre	easing N	ASU's t	uition	would t	be a bac	l idea.	
Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
5. Overall, the author	r feels t	hat incr	easing t	tuition	at MSU	would	be	
Negative	1	2	3	4	5	6	7	Positive
6. Overall, the author	r feels t	hat incr	easing	tuition	at MSU	would	be	
Favorable	1	2	3	4	5	6	7	Unfavorable

*Items marked with an asterisk were dropped to obtain satisfactory fit of the measurement model.

Appendix I

Perceived credibility of the source

Instructions: The following questions pertain to your general impression of the author who presented the proposal to raise MSU's tuition. Please read each item carefully and respond accordingly.

For each of the questions, choose the one number (1-7) that best represents your impression of the author of the message you just read.

Intelligent	1	2	3	4	5	6	7	Unintelligent
Inexpert	1	2	3	4	5	6	7	Expert
Informed	1	2	3	4	5	6	7	Uninformed
Incompetent	1	2	3	4	5	6	7	Competent
[Trustworthine	<u>ss]</u>							
Honest	1	2	3	4	5	6	7	Dishonest
Untrustworthy	1	2	3	4	5	6	7	Trustworthy
Unethical	1	2	3	4	5	6	7	Ethical
Phony	1	2	3	4	5	6	7	Genuine

[Competence]

Appendix J

<u>Perceived Argument Strength</u>

Directions: On the scales below, please indicate your feelings about the arguments that the author presented regarding whether or not MSU should increase tuition.

Numbers "1" and "7" indicate a very strong feeling. Numbers "2" and "6" indicate a strong feeling. Numbers "3" and "5" indicate a fairly week feeling. Number "4" indicates you are undecided or do not understand the adjective pairs themselves. There are no right or wrong answers.

I believe the arguments about increasing MSU's tuition presented by the author of the proposal were:

*a. Convincing	1	2	3	4	5	6	7	Unconvincing
b. Reasonable	1	2	3	4	5	6	7	Unreasonable
c. Unsound	1	2	3	4	5	6	7	Sound
d. Believable	1	2	3	4	5	6	7	Not believable
e. Not plausible	1	2	3	4	5	6	7	Plausible

*Items marked with an asterisk were dropped to obtain satisfactory fit of the measurement model.

Appendix K

Cover Story

This survey is part of a study that is being conducted as part of a joint collaboration between the Department of Communication and MSU's Student Affairs. The study is part of a project to examine student opinions and to gather student insight about a variety of university policies and issues related to the MSU community.

In August of 2011, MSU developed a new task force whose aim is to develop and evaluate solutions to the financial crisis that MSU is currently facing. Because the solutions necessarily involve and will impact MSU's undergraduate population, it is important to obtain insight from current MSU students regarding the policy proposals that will potentially be considered for implementation.

At this time, you will be asked to provide insight regarding issues relevant to the MSU community and you will be asked to answer some questions about yourself and about your opinions toward MSU student affairs, toward university services, and toward potential solutions that aim to ameliorate MSU's budget crisis. Your responses will be completely confidential. Because the university will be using your responses to evaluate policies that may be implemented at MSU, it is important that you answer each question honestly.

Appendix L

Example Filler Items:

Instructions: The following questions ask about a variety of opinions and topics that are relevant to student life at MSU. For each of the questions, choose the number (1-7) that best represents your response to the question or statement presented.

1. I feel that MSU offers plenty of opportunities for students to become involved outside of the classroom.

Strongly Disagree Strongly Agree 2. I think that decreasing the price of student health insurance at MSU is a wise suggestion. Strongly Disagree Strongly Agree 3. I feel that decreasing the length of freshman orientation at MSU would be a foolish idea. Strongly Disagree Strongly Agree 4. I think that requiring all MSU students to participate in academic orientation every summer prior to starting fall semester is a good idea. Strongly Disagree Strongly Agree 5. I think that decreasing the length of freshman orientation at MSU is a wise suggestion. Strongly Disagree Strongly Agree

6. I feel that increasing the number of credits required to graduate from MSU would be a good idea.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

7. I think that increasing the number of sciences classes required to graduate from MSU is a worthless idea.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
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Appendix M

Approximately one week ago, you completed Part 1 of this study that asked about your attitudes and opinions toward various university policies and issues relevant to students at MSU. This survey is Part 2 of the study that you completed one week ago. At this time, you will be asked to read a few short messages and to answer some questions about yourself and about your opinions toward MSU student affairs, toward university services, and toward potential solutions that aim to ameliorate MSU's budget crisis.

You may recall that this study is being conducted as part of a joint collaboration between the Department of Communication and MSU's Student Affairs. The goal of the collaboration is to examine student opinions and to gather student insight about a variety of university policies and issues related to the MSU community. Specifically, MSU's Student Affairs is interested in assessing student responses to policy proposals that will potentially be considered for implementation at MSU

Your responses will be completely confidential. Because the university will be using your responses to evaluate policies that may be implemented at MSU, it is important that you answer each question honestly.

Appendix N

Table 1. Factor loadings for focal pretest measures.

Maasura	Itom	Factor
wieasure	nem	Loading
Attitude	I feel that increasing MSU's tuition would be a good idea.	.73
Attitude	I think that increasing MSU's tuition is a wise suggestion.	.88
Attitude	I feel that increasing MSU's tuition would be a bad idea.	.73
Attitude	Overall, I feel that increasing tuition at MSU would be(Negative/	.90
	Positive)	
Attitude	Overall, I feel that increasing tuition at MSU would be(Favorable/	.62
	Unfavorable)	
Attitude	Given all of the positives and negatives related to increasing MSU's	.73
Certainty	tuition, how confident are you that of all the possible attitudes one	
	might have, your attitude reflects the right way to think and feel about	
	raising MSU's tuition?	
Attitude	In light of all of the pros and cons regarding raising MSU's tuition,	.91
Certainty	how certain are you that your attitude toward increasing MSU's tuition	
	is the correct attitude to have?	
Attitude	Given all of the positives and negatives related to increasing MSU's	.85
Certainty	tuition, please indicate your agreement with the following statement:	
	"The opinion that I reported toward raising tuition at MSU is definitely	
	the correct attitude to have."	
Attitude	In light of all of the pros and cons regarding raising MSU's tuition,	.70
Certainty	please indicate your agreement with the following statement: "I have	
	no doubt that my attitude toward increasing tuition at MSU is the	
	correct attitude to have."	
Involvement	Whether MSU increases the cost of tuition or not has little impact on	.75
(ORI)	my life.	

Table 1 (cont'd)

Involvement (ORI)	All in all, the effect of raising tuition costs at MSU on my life is small.	.94
Involvement	Raising tuition costs at MSU will have little effect on me.	.96
(ORI)		
Involvement	My life would not change much if MSU were to increase tuition.	.88
(ORI)		
Involvement	Knowing my position on increasing MSU's tuition is central to	.63
(VRI)	understanding the kind of person I am.	
Involvement	My position on raising tuition at MSU is based on the values with	.86
(VRI)	which I try to conduct my life.	
Involvement	The arguments for or against increasing MSU's tuition are relevant to	.99
(VRI)	the core principles that guide my life.	
Involvement	My beliefs about how I should live my life determine my position on	.83
(VRI)	raising tuition at MSU.	

Table 2. Factor loadings for focal posttest measures, including measures used to assess message properties.

Moosuno	Item					
wieasure						
Attitude	I feel that increasing MSU's tuition would be a good idea.					
Attitude	I think that increasing MSU's tuition is a wise suggestion.	.88				
Attitude	I feel that increasing MSU's tuition would be a bad idea.					
Attitude	Overall, I feel that increasing tuition at MSU would	.90				
	be(Negative/ Positive)					
Attitude	Overall, I feel that increasing tuition at MSU would	.62				
	be(Favorable/ Unfavorable)					
Attitude	Given all of the positives and negatives related to increasing	.93				
Certainty	MSU's tuition, how confident are you that of all the possible					
	attitudes one might have, your attitude reflects the right way to					
	think and feel about raising MSU's tuition?					
Attitude	In light of all of the pros and cons regarding raising MSU's tuition,	.91				
Certainty	how certain are you that your attitude toward increasing MSU's					
	tuition is the correct attitude to have?					
Attitude	Given all of the positives and negatives related to increasing	.87				
Certainty	MSU's tuition, please indicate your agreement with the following					
	statement: "The opinion that I reported toward raising tuition at					
	MSU is definitely the correct attitude to have."					
Attitude	In light of all of the pros and cons regarding raising MSU's tuition,	.81				
Certainty	please indicate your agreement with the following statement: "I					
	have no doubt that my attitude toward increasing tuition at MSU is					
	the correct attitude to have."					
Perceived	The author feels that increasing MSU's tuition would be a good	.94				
Message	idea.					
Advocacy						

Table 2 (cont'd)

Perceived	The author thinks that increasing MSU's tuition is a wise	.97
Message	suggestion.	
Advocacy		
Perceived	The author feels that increasing MSU's tuition would be a bad	.97
Message	idea.	
Advocacy		
Perceived	Overall, the author feels that increasing tuition at MSU would be	.96
Message	(Negative/ Positive)	
Advocacy		
Perceived	Overall, the author feels that increasing tuition at MSU would be	.79
Message	(Favorable/ Unfavorable)	
Advocacy		
Perceived	Intelligent/ Unintelligent	.80
Source		
Competence		
Perceived	Inexpert/ Expert	.89
Source		
Competence		
Perceived	Informed/ Uninformed	.97
Source		
Competence		
Perceived	Incompetent/ Competent	.85
Source		
Competence		
Perceived	Honest/ Dishonest	.89
Source		
Trustworthiness		

Table 2 (cont'd)

Perceived	Untrustworthy/ Trustworthy	.91
Source		
Trustworthiness		
Perceived	Unethical/ Ethical	.84
Source		
Trustworthiness		
Perceived	Phony/ Genuine	.91
Source		
Trustworthiness		
Perceived	Reasonable/ Unreasonable	.76
Argument		
Strength		
Perceived	Unsound/ Sound	.87
Argument		
Strength		
Perceived	Believable/ Not believable	.87
Argument		
Strength		
Perceived	Not plausible/ Plausible	.79
Argument		
Strength		

Table 3. Summary statistics for assessing systematic differences associated with attrition.

Analyses performed to assess potential group differences between those subjects who completed

VARIABLE	POST- TEST	Ν	Mean	SD	t	df	Sig. (2-tailed)
ATTITUDE	NO	36	2.04	1.12	.11	182	.914
	YES	148	2.02	.98			
ATTITUDE	NO	37	5.25	1.23	.39	186	.699
CERTAINTY	YES	151	5.16	1.32			
ORI	NO	38	4.74	1.96	-2.00	193	.047*
	YES	157	5.36	1.68			
VRI	NO	38	3.93	1.75	.15	188	.883
	YES	152	3.89	1.48			
AGE	NO	39	20.28	2.34	.16	197	.871
	YES	160	20.23	1.87			
SEX	NO	39	.28	.46	.01	197	.992
	YES	160	.28	.45			
EXPECTED	NO	39	2.46	.76	.37	197	.709
GRADUATION	YES	160	2.41	.73			

both the pretest and the posttest versus those subjects who completed only the pretest.

Table 4. Pretest means and standard deviations for posttest groups. Descriptive statistics

 presented for subjects assigned to the posttest "persuasive message absent" and "persuasive

 message present" groups.

PRETEST VARIABLE	POST-TEST PERSUASIVE MESSAGE	Mean	SD
ATTITUDE	NO	1.99	1.04
	YES	2.06	.91
ATTITUDE	NO	5.36	1.24
CERTAINTY	YES	4.97	1.37
ORI	NO	5.54	1.63
	YES	5.19	1.72
VRI	NO	4.02	1.44
	YES	3.76	1.52

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