

TESTING EXPOSURE TO NOSTALGIC MESSAGES AS AN ALTERNATIVE SELF-
AFFIRMATION INDUCTION TO REDUCE DEFENSIVE PROCESSING AND PROMOTE
MESSAGE ACCEPTANCE

By

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ABSTRACT

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The study developed a communication-based induction of self-affirmation, and examined how it interacted with argument strength to reduce defensiveness and enhance the persuasiveness of a health message. Unlike traditional self-affirmation inductions that are behavior-based and involve instructing people to engage in a cumbersome task, this alternative induction affirms self-concepts through exposure to a personal nostalgic message. In study 1, this alternative induction was as effective as the traditional method of ranking values and writing an essay to affirm positive attributes. Study 2 tested whether the alternative induction can offer a broader perspective of the self and generate stronger positive other-directed emotions in the same way as traditional self-affirmation methods used by previous research, and whether these psychological outcomes can interact with argument strength to enhance message acceptance via mitigating defensive processing. A 2 (self-affirmation: personal nostalgic message vs. control) \times 2 (argument strength: strong vs. weak) between-group online experiment showed that exposure to a personal nostalgic message (vs. control message) produced broader perspectives of the self and greater other-directed emotions. However, the data were inconsistent with the predicted interaction effects. Rather, there were only main effects of argument strength on reducing defensiveness and promoting attitudes and intentions to adopt the message recommendation. Although the alternative induction did not replicate the persuasive outcome of traditional self-affirmation methods observed in previous research, this study served as a beginning to

investigate how communication can play a central role in affirming self-concepts to promote acceptance of a persuasive message. The practical implications of developing a message-based self-affirmation for campaign professionals are discussed.

Keywords: personal nostalgic message, self-affirmation, defensiveness, persuasion, caffeine consumption

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for your unconditional love and belief in me.

To Lanqing Liu, for always being with me, making my life full of laugh and love, and
sharing happiness and sadness over the past four years. It would have been a very lonely, tough,
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INTRODUCTION

Self-affirmation is an act that enables people to reflect on their positive values, characteristics, and achievements (Sherman & Cohen, 2006). This strategy has been shown to reduce biased processing and enhance acceptance of health messages (Epton, Harris, Kane, van Koningsbruggen, & Sheeran, 2015; Sweeney & Moyer, 2015). When people are affirmed that they have a positive self-image in general, they tend to broaden their views of self-identities, experience other-directed emotions, and perceive that any subsequent persuasive attempts only challenge a narrow aspect of the self (e.g., you are an unhealthy person because of smoking) (Critcher & Dunning, 2015; Crocker, Niiya, & Mischkowski, 2008). As the need to protect self-integrity reduces, people become more open-minded and are more likely to scrutinize the informational value of the persuasive attempt with an open mind. If the argument is weak, then affirmed individuals are likely to develop negative thoughts that attack the persuasive attempt. However, if such an attempt makes a solid argument to justify a certain position, then affirmed (vs. unaffirmed) individuals are less likely to engage in defensive processing (Correll, Spencer, & Zanna, 2004). As a result of mitigated defensive processes, people are more likely to accept the message position.

This process suggests that the effect of self-affirmation on enhancing the acceptance of subsequent persuasive attempt is qualified by argument strength. However, many studies on self-affirmation view this technique as a guarantee of the success of the subsequent persuasive message without considering the quality of such a message. This practice may partly explain why self-affirmation only has a small effect size on message acceptance (Epton et al., 2014; Sweeney & Moyer, 2015). Additionally, for studies that consider argument strength as a

moderator, they did not examine directly the process through which argument strength promotes the effectiveness of self-affirmation (Correll et al., 2004).

Furthermore, despite the fact that self-affirmation has been used to enhance the effectiveness of persuasive messages, this technique is not a communication strategy. Most research induced self-affirmation by asking people either to recall personally important events or to check a set of statements about personal values (McQueen & Klein, 2006). With a few exceptions (Arpan, Lee, & Wang, 2017; Dillard, McCaul, & Magnan, 2005), limited communication research has explored how messages can play a central role in affirming people's self-integrity. To extend this line of research, this study proposes that personal nostalgic messages can be an alternative means of inducing self-affirmation.

Personal nostalgia refers to positive affect toward and preference for the past that people experience (Holbrook & Schindler, 1991). Previous research showed that personal nostalgia can affirm positive self attributes because such a feeling can remind people of interpersonal successes and diverse aspects of self-identities (Vess, Arndt, Routledge, Sedikides, & Wildschut, 2012; Sedikides, Wildschut, Routledge, & Arndt, 2015). Although feelings of personal nostalgia can be triggered by messages representing fond memories (Holak & Havlena, 1991), the possibility whether or not personal nostalgic messages can also induce self-affirmation and promote the effectiveness of a subsequent persuasive message has not been examined.

In summary, this study seeks to a) explore whether or not personal nostalgic messages can serve as an alternative induction of self-affirmation, and b) examine whether or not the effect of self-affirmation (induced by a nostalgic message) on promoting the persuasiveness of a subsequent message is moderated by argument strength. Specifically, it is expected that people who are affirmed (vs. not affirmed) are more likely to experience other-directed emotions and

obtain broader perspectives of the self. This process can enable people to recognize the information merit and generate less defensiveness when they are exposed to a strong persuasive message. In comparison, for those exposed to a weak message, they were more likely to produce defensive responses. Furthermore, when people engage in defensive processing, they are less likely to adopt the message recommendation.

CHAPTER 1: LITERATURE REVIEW

Self-affirmation and Persuasion

People strive to maintain a global sense of self-integrity or self-concept – “being a good and appropriate person” (Sherman & Cohen, 2006, p. 186). Such a global self can consist of a set of specific domains, such as social roles (e.g., being an active member of a student club), values (e.g., being benevolent), goals (e.g., being healthy), and so forth. Yet, these domains of self may be under attack by various social influence attempts (Zhao & Nan, 2010). For example, telling a smoker that smoking is bad for his/her lungs may threaten this person’s self-concept as being healthy. To protect the global sense of self-integrity, people are especially vigilant to and defend against social influences that potentially attack their important self-domains (Cohen & Sherman, 2014; Klein & Ferrer, 2018; Sherman & Cohen, 2006). This defensive processing can take the forms of downplaying the risk information contained in the message, derogating the source, feeling anger toward the message or messenger, or perceiving the message as being manipulative (Nan & Zhao, 2012; van’t Riet & Ruiter, 2013).

One strategy that can mitigate defensive processing of persuasion message and promote message acceptance is self-affirmation (Arpan et al., 2017; Epton et al., 2015; Sweeney & Moyer, 2015; Zhao & Nan, 2010). Self-affirmation enables people to demonstrate their achievements or valued attributes (Cohen & Sherman, 2014; Sherman & Cohen, 2006; Steele, 1988). According to self-affirmation theory, the self is a flexible system, such that success in one domain can compensate for a failure in another domain and help people maintain or restore their global sense of self-integrity (Cohen & Sherman, 2014; Sherman & Cohen, 2006; Steele, 1988). Specifically, by focusing people on their positive achievements, values, or attributes unrelated to a threatening message, they can obtain broader perspectives of the self, meaning that people can realize that

they have multiple self-identities beyond the domain being threatened (Critcher & Dunning, 2015). Additionally, self-affirmation can generate positive feelings to care about others (i.e., other-directed emotions), such as love and connected (Crocker et al., 2008). If people are defensive, enabling them to transcend the self can help people see that threats carry very few implications for denying overall self-integrity (Critcher & Dunning, 2015; Crocker et al., 2008). As a result, affirmed people tend to see less need to defend against the threat and spend the cognitive energy to examine the informational value of the persuasive message (Cohen & Sherman, 2014; Correll et al., 2004; Sherman & Cohen, 2006). The unbiased information processing then leads people to adopting the behavior advocated by the message. Consistent with this reasoning, van Koningsbruggen, Das, and Roskos-Ewoldsen (2009) report that the process of self-affirmation increases intention to adopt the advocated behavior via decreasing defensive processing of the message (i.e., shorter time to react to threat-related words mentioned in the message, more positive judgment of the message effectiveness). Two meta-analyses also showed that having self-affirmation alongside persuasive health information has small but significant effects on promoting message response, intentions to change, and subsequent behavior (Epton et al., 2015; Sweeney & Moyer, 2015).

Notably, the positive effect of self-affirmation on message acceptance only occurs when the message is strong. A strong argument is one that contains evidence with high probative value and whose premises lead logically to the conclusion (Wyer, 1975). When people scrutinize the message with an open mind, they are able to differentiate sound arguments from flawed ones. If the message is strong, affirmed individuals will find the information advocating behavioral change valuable and thus accept the message recommendation. In contrast, if the message is weak, then affirmed individuals may generate negative thoughts why the message is not justified

and show no, little, or even opposite attitude change to what the message advocates. Consistent with this rationale, Correll et al. (2004) report that affirmed individuals only accept the message when such a message is strong instead of weak.

Self-affirmation Induction

Despite the fact that self-affirmation is a frequently used technique to enhance message persuasiveness, this technique itself is not a communication strategy. Researchers typically induce self-affirmation in two ways (McQueen & Klein, 2006). In the first approach, researchers first measure participants' important values in a pilot study. In a subsequent study, researchers then ask these participants to indicate their agreement on a set of values that they previously identified as important as a means of affirming how they define themselves (Napper, Harris, & Epton, 2009). Alternatively, researchers can ask people to identify and recall an event when they achieved an important goal, won an award, or demonstrated a positive characteristic. One exception that utilizes the message to induce self-affirmation is a study by Arpan et al. (2017). In their study, the authors presented the affirmative text ("As an FSU student, you value being kind, being honest, and having good relationships") before the persuasive message (Arpan et al., 2017, p. 193).

Given that messages should play a central role in the communication process (Berlo, 1960), developing and testing more message-centered strategies to induce self-affirmation is important. As self-affirmation operates through providing resources for the self, any external stimuli that engage people in thinking about positive attributes of the self may function similarly as a self-affirmation induction. One such stimulus can be a nostalgic message (Routledge, 2016; Vess et al., 2012).

Nostalgia, Nostalgic Messages, and Self-affirmation

Although nostalgia was conceived originally as a mental disease in early medical research (Hofer, 1688/1934), recent studies conceptualize nostalgia as favorable affect toward, and a yearning for, objects (people, places, experiences, or things) from the past (Holbrook & Schindler, 1991). Similarly, in lay person's theory, the central themes of nostalgia include "rose-tinted memory," "the past," "happiness," "remembering," "childhood," and "social relationships" (Routledge, 2016). Nostalgia can be described both along the affective and cognitive dimensions. Traditionally, nostalgia is characterized as a bittersweet experience combining positive and negative feelings; however, recent research shows that the positive feelings including joy, happiness, and warmth outweigh the negative ones (e.g., sadness) (Wildschut, Sedikides, Arndt, & Routledge, 2006). Nostalgia also has a cognitive component because this emotion is an idealized recollection of the themes, episodes, or events in the past (Muehling & Pascal, 2011 & 2012).

Notably, depending on the past brought to mind, people can experience personal or historical nostalgia. Personal nostalgia is evoked when people remember the past they experienced, whereas historical nostalgia is evoked when people remember a time before their birth, and possibly something learned vicariously (Holak & Havlena, 1992). This study focuses on personal nostalgia because this emotion is based on people's own experience and has a stronger connection to the self, and so personal nostalgia may better remind people of their positive self-concept than historical nostalgia.

Feelings of personal nostalgia can be evoked by message appeals (Havlena & Holak, 1991). Personal nostalgic messages usually feature happy themes, episodes, or events in the past that people typically experience (Hussain & Lapinski, 2017; Marchegiani & Phau, 2010;

Muehling & Sprott, 2004; Unger, McConocha, & Faier, 1991). Note that the nostalgic message does not necessarily need to represent idiosyncratic memories, but can also feature events experienced by most people in their childhood (Cox, Kersten, Routledge, Brown, & van Enkevort, 2015). In a content analysis of the use of nostalgic appeals in television commercials, Unger et al. (1991) report that the major themes include fond memories of family activities and olden days. Typical stimuli that construct these themes include odors, music, photographs, and videos.

Traditionally, personal nostalgic messages have been used in advertising to enhance consumers' attitude toward the ad, attitude toward the brand, and purchase intention (Chou & Lien, 2014; Muehling & Pascal, 2011 & 2012; Muehling & Sprott, 2004). More recently, this message feature has been applied to promote health behaviors (Hussain & Lapinski, 2017). For example, Hussain and Lapinski (2016) found that people exposed to a personal nostalgic message developed a more negative attitude toward smoking and stronger quitting intentions than those exposed to a control message (i.e., a car oil change video). This finding shows the promising value of using the personal nostalgic message to persuade especially given the fact that smokers tend to have defensive responses to anti-smoking messages (Nan & Zhao, 2012).

The reasons why personal nostalgic messages can reduce defensiveness and enhance the effectiveness of a subsequent persuasive message can be understood from the perspective of self-affirmation. First, like other self-affirmation inductions, a validation of critical aspects of the self is an intrinsic feature of a personal nostalgic message. Specifically, because personal nostalgia is characterized by happy memories about social relationships in the past (Hepper, Ritchie, Sedikides, & Wildschut, 2012; Holak & Havlena, 1992), this experience can reassure people that they had interpersonal success and were/are loved and valued by others (Sedikides et al., 2016),

which is an important attribute of self-integrity (Sedikides, Wildschut, & Baden, 2004; Vess et al., 2012). As a personal nostalgic message features themes related to cherished memories and meaningful experiences, such a message can reinforce self-concept and provide a resource for the self in the same fashion as the self-affirmation induction (Routledge, 2016)¹.

Second, just as self-affirmation can enhance persuasion outcomes through other-directed positive feelings (Crocker et al., 2008), such as love and connectedness, exposure to nostalgic appeals can also promote message acceptance because this message feature can generate the same emotional experience. For example, music-evoked nostalgia has been reported to increase feelings of love, protection, and connection (Routledge et al., 2011). These other-directed feelings can enable people to transcend the self, inspiring them to improve and learn from potentially threatening information (Crocker et al., 2008).

Furthermore, the self-affirmation induction leads to a self-expansion process that parallels how the nostalgic appeal produces self-continuity. Through reflecting on a nostalgic event from the past, people experience a sense of self-continuity that connects their past to who they are now (Sedikides et al., 2015). When people have a broader perspective on the self, they tend to perceive the threat as only pertaining to a narrow aspect of the self and thus feel less need to defend against the threatening information. With less defensiveness to the message, people are then more likely to accept the message recommendation when the argument is strong (vs. weak).

Consistent with the preceding reasoning, empirical research has also provided evidence for the effect of personal nostalgia on affirming positive self-attributes (Baldwin, Biernat, &

¹ Notably, the nostalgic message used in this study was based on themes identified in a pilot study and may not be tailored to each participant's life experience. Although these nostalgic themes were happy episodes, some people may feel sad because these themes could remind that they were once loved and no longer are. The representation of happy memories is an intrinsic property in a personal nostalgic message that does not require checking people's perception (O'Keefe, 2003). However, it would be helpful to measure people's emotional response to nostalgic messages in future research.

Landau, 2015; Vess et al., 2012). In a study by Vess et al. (2012), the researchers randomly assigned participants to think about either a nostalgic event or a positive event in their future (i.e., control condition) and then asked them to categorize whether or not a set of personality traits were characteristic of them. The results showed that participants who recalled a nostalgic event (vs. future event) were faster to categorize positive self-attributes.

The Present Research

Given nostalgia can activate positive self-attributes in the same fashion as self-affirmation, in this study it is expected that exposure to a nostalgic message can be an alternative induction of self-affirmation. Furthermore, self-affirmation broadens people's views of the self and evokes other-directed emotions, which in turn interact with argument strength to affect defensive processing and ultimately message acceptance. Specifically, for people who experience greater other-directed emotions and obtain broader views of the self, exposure to strong arguments can mitigate defensive processing (including anger, negative thoughts, derogation, perceived message manipulation), whereas exposure to weak arguments can increase such defensive reactions. As a consequence of defensive message processing, people are less likely to develop positive attitudes and intentions to adopt the message position. Figure 1 on page 79 presents the hypothesized model, and Figure 2 and 3 presented the hypothesized paths under the strong and weak message conditions.

To test the predictions, the present project consists of two studies. Study 1 examines whether or not a personal nostalgic message can be an alternative induction of self-affirmation. In this study, a personal nostalgic message and a traditional self-affirmation induction were tested against two control tasks to induce affirmation. If nostalgia can affirm people's self-concept, participants in the nostalgic and traditional affirmation conditions will score

significantly higher on the measurement of perceived self-affirmation compared to those in the control conditions. If study 1 demonstrates that a nostalgic message can be an alternative self-affirmation induction, then study 2 examines the interaction effect of nostalgic message and argument strength on defensive processing and message acceptance. Specifically, study 2 manipulates both argument strength and self-affirmation (via presenting a nostalgic message vs. a message without a nostalgia appeal).

The topic to test the hypotheses is caffeine consumption. This topic has been frequently used to examine the effectiveness of self-affirmation to reduce defensive processing and promote message acceptance (van Koningsbruggen et al., 2009). Moreover, caffeine consumption is prevalent among college students (Shohet & Landrum, 2001), yet this behavior is associated with a set of negative outcomes. For example, caffeine consumption has been linked to sleep problems, which negatively affected academic performance (Hershner & Chervin, 2014). Additionally, college students reported consuming certain types of caffeinated beverages (e.g., energy drinks) in conjunction with alcohol, and extreme alcohol consumption can promote risky sexual behaviors (Miller, 2008).

CHAPTER 2: METHOD

Study 1

Study 1 is a 2 (affirmation: affirmed vs. control condition) x 2 (induction method: traditional essay vs. alternative induction) between-group experiment. The dependent variable is the induction check of self-affirmation.

Participants

Two hundred and eighty-three participants were recruited through a post on the participant pool of the Department of Communication at Michigan State University or an email request distributed to undergraduate students from the same university. Nine responses were removed due to duplicate IP addresses, resulting in a sample of 274 responses. A three-way analysis of variance (ANOVA) indicated no evidence for the main effect of the recruitment approach, $F(1, 266) = 0.12, p = .73$, or any interactions effect of recruitment \times induction, recruitment \times affirmation, or recruitment \times affirmation \times method on the induction check of self-affirmation, $F_s(1, 266) < 3.41, p_s > .07$. Therefore, data collected from different sources were collapsed.

Over one-half of the participants were female (61.31%), and the average age was 19.95 ($SD = 1.47$). The majority of the participants reported to be Caucasian (76.28%), followed by African/African American (9.49%), Asian/Asian American (9.49%), Hispanic (3.28%), and other ethnicities (1.46%). The sample consisted of 32.85% freshmen, 22.99% sophomores, 22.99% juniors, and 21.68% seniors.

Procedures

Upon signing-up for the study online, participants received a link to the survey on Qualtrics. After giving their consent to participate in the study, participants answered

demographic questions and then were randomly assigned to one of four conditions. In one-half of the conditions, participants engaged in self-affirmation tasks, whereas in the other one-half of the conditions, participants engaged in control tasks. Following the tasks, participants completed a questionnaire assessing the effectiveness of the self-affirmation induction.

Self-affirmation Induction

The self-affirmation induction involved a traditional self-affirmation task and a nostalgic message alongside two control conditions. Forty five participants were assigned to the traditional self-affirmation condition that instructed them to rank five values (i.e. kindness, honesty, generosity, independence, and success) according to their personal importance. For the value identified as the most important, the study asked the participants to write down the reason why the value was important and the personal experience that the participants have had that demonstrated such a value. Eighty-nine participants were assigned to the alternative self-affirmation condition in which they heard an audio about nostalgia. Based on the script used by Hussain and Lapinski (2017), this audio incorporated nostalgic themes (e.g., graduation ceremony, family gatherings) related to social relationships elicited in a formative survey (see Appendix A for the formative survey questionnaire) of 98 college students (23 males, 70 females, and 5 sex unidentified, $M_{age} = 19.82$, $SD_{age} = 2.28$) to ensure that the message resonated with participants². The length of the nostalgic audio was 2 minutes and 46 seconds.

The two control conditions matched the two self-affirmation tasks³. To match the condition of writing an essay about personal values and experiences, the control task asked 57 participants to list everything that they had eaten or drank in the past 48 hours in as much detail as possible. These participants were told that they did not need to worry about those things that

² The link to the nostalgic audio is <https://youtu.be/inrULNqr0K4>; the link to the car oil change audio is <https://youtu.be/P85GPrZNzyl>.

³ The use of multiple control conditions aims to control task nature as a potential confounding variable.

they were unable to remember (Cohen, Aronson, & Steele, 2000; Napper et al., 2009). To match the nostalgic message condition, the second control condition was exposure to an audio about changing car oil, which was presented to 83 participants. The length of the car oil change audio was 2 minutes and 52 seconds. See Appendix B for the traditional self-affirmation task and its control condition and appendix C for the alternative self-affirmation task.

Furthermore, a separate pilot study conducted among 73 college students (35 males, 38 females, $M_{age} = 20.73$, $SD_{age} = 1.61$) was used to examine the nostalgia induction. The induction check of nostalgia was measured with a 6-item scale developed by Marchegiani and Phau (2013). An independent groups t-test showed a significant difference in perceived nostalgia between participants in the nostalgia and the control condition, $t(64.59) = 10.58$, $r = .78$, $p < .001$. Specifically, compared to participants who listened to the control audio ($M = 2.65$, $SD = 1.36$), those who listened to the nostalgic audio reported greater feels of nostalgia ($M = 5.62$, $SD = 1.01$). See Appendix D for the pilot test questionnaire.

Measures

Induction check. The effectiveness of the self-affirmation induction was assessed by the self-integrity scale (Sherman, Cohen, Nelson, Nussbaum, Bunyan, & Garcia, 2009) and the self-affirmation scale (Napper et al., 2009). Both scales have been used previously to check the self-affirmation induction. The self-integrity scale consists of eight items. Sample items include “I have the ability and skills to deal with whatever comes my way” and “I am a good person.” In the self-affirmation scale, participants first read a statement “The message/essay/questionnaire made me...” and then indicate their opinions on five items “Think about positive aspects of self”, “Focus my attention on who I am”, “Aware of things I value about myself”, “Think about things

personally important to me”, and “Think about my values”. For both scales, participants responded on 7-point Likert scales with higher scores indicating more of the constructs.

Demographics. Participants’ sex, age, ethnicity, and year in school were measured as demographic characteristics. Appendix E presents the questionnaire for study 1.

Analyses Strategies

Before testing whether exposure to a personal nostalgic message can induce self-affirmation, confirmatory factor analyses were conducted to examine the content validity of the perceived self-affirmation in AMOS and lessR package. Items producing substantial residuals in lessR were removed for subsequent analyses. After this process, AMOS was used to estimate the fit of the measurement model, which was based on the maximum likelihood method. Standards for a good model involved the Comparative Fit Index ($CFI \geq .95$), Root Mean Square Error of Approximation ($RMSEA \leq .06$), and Standardized Root Mean Square Residual ($SRMR \leq .05$). Standards for an acceptable model fit involved $CFI \geq .90$, $RMSEA \leq .08$, and $SRMR \leq .08$ (Hu & Bentler, 1999).

To examine the research question, the data were analyzed in three steps. First, this study performed a two-way ANOVA to examine the effect of affirmation and induction method on perceived self-affirmation. Next, the data were split by the induction method, and independent t-tests were conducted to investigate the mean difference in perceived self-affirmation between people in the affirmation and the control conditions. Also, to check whether perceived self-affirmation exceeds the mid-point (4) for participants in the affirmation conditions, one-sample t-tests were conducted. The above analyses were performed for perceived self-affirmed measured with the self-integrity and the self-affirmation scales.

CHAPTER 3: RESULTS

Confirmatory Factor Analysis

After removing three items in the self-integrity scale⁴, the measurement model achieved a good fit, $CFI = .97$, $NFI = .95$, $RMSEA = .07$, $SRMR = .05$. Table 1 summarizes the descriptive statistics for and correlations among major variables.

Main Analysis

This study conducted a two-way ANOVA to examine the effect of affirmation and induction method on perceived self-affirmation measured with the self-affirmation and the self-integrity scale respectively.

Perceived self-affirmation measured with the self-affirmation scale. The results revealed the main effect of affirmation on perceived self-affirmation, $F(1, 270) = 77.50$, $p < .001$, $\eta^2 = .20$, $r = .45$. Specifically, participants in the self-affirmation condition ($M = 5.16$, $SD = 1.26$) reported greater perceptions of self-affirmation than those who were in the control condition ($M = 3.70$, $SD = 1.42$). Also, the results showed the main effect of induction method on perceived self-affirmation, $F(1, 270) = 18.59$, $p < .001$, $\eta^2 = .05$, $r = .22$. Specifically, participants in the essay condition ($M = 4.80$, $SD = 1.47$) reported greater perceptions of self-affirmation than those who were in the audio condition ($M = 4.19$, $SD = 1.52$). Additionally, the results demonstrated a marginally significant interaction between affirmation and induction method, $F(1, 267) = 3.46$, $p = .06$, $\eta^2 = .01$, $r = .10$.

To assess the effect of affirmation inductions on perceived self-affirmation in different induction method conditions, the study conducted two independent t tests. For participants completing the traditional self-affirmation condition (i.e., writing an essay), the results showed

⁴ The items removed were “I feel I am basically a moral person.”, “I try to do the right thing.”, and “I am a good person.”

that those who wrote a value essay ($M = 5.43$, $SD = 1.32$) reported greater perceptions of self-affirmation than those who listed food consumed ($M = 4.30$, $SD = 1.39$), $t(100) = 4.16$, $r = .38$, $p < .001$. In comparison, for participants exposed to an audio, those who listened to the nostalgic message ($M = 5.02$, $SD = 1.22$) reported greater perceptions of self-affirmation than those who listened to the car oil change message ($M = 3.29$, $SD = 1.29$), $t(170) = 9.04$, $r = .57$, $p < .001$.

Also, one-sample t tests compared the score of perceived self-affirmation in each condition to the mid-point (4). The results revealed those exposed to the nostalgic message, $t(88) = 7.97$, $p < .001$, and those writing a value essay, $t(44) = 7.25$, $p < .001$, reported scores exceeding the mid-point, whereas those exposed to the car oil change audio were below the mid-point, $t(82) = -4.97$, $p < .001$. Also, there was no evidence for the difference between the score of those listing food/drinks and the mid-point, $t(56) = 1.62$, $p = .11$.

Perceived self-affirmation measured with the self-integrity scale. The results showed no main effect of affirmation on perceived self-integrity, $F(1, 270) = 0.00$, $p = .98$, $\eta^2 = .00$, $r = .00$. Specifically, there is no evidence for the difference in perceived self-integrity between those in the affirmed ($M = 5.71$, $SD = 0.81$) and the control condition ($M = 5.71$, $SD = 0.77$). Also, there is no evidence for the main effect of induction method on perceived self-integrity, $F(1, 270) = 0.30$, $p = .58$, $\eta^2 = .00$, $r = -.03$. Participants in the essay condition ($M = 5.75$, $SD = 0.84$) did not report significantly different scores on perceived self-integrity from those in the audio condition ($M = 5.69$, $SD = 0.76$). Additionally, no evidence for the affirmation \times induction method effect on perceived self-integrity emerged, $F(1, 270) = 0.02$, $p = .89$, $\eta^2 = .00$, $r = .01$.

Furthermore, when the study split the data by the induction method, the results of an independent t -test revealed no evidence for the difference in perceived self-integrity between those who completed the traditional self-affirmation task ($M = 5.74$, $SD = 0.82$) and its control

condition ($M = 5.75$, $SD = 0.86$), $t(100) = -.10$, $r = -.01$, $p = .92$. Additionally, the results showed no evidence for the difference in perceived self-affirmation between those who completed the alternative self-affirmation task ($M = 5.70$, $SD = 0.80$) and its control condition ($M = 5.69$, $SD = 0.71$), $t(170) = .09$, $r = .01$, $p = .93$.

Also, one-sample t-tests demonstrated that the scores of self-integrity exceeded the midpoint for each of the four conditions, $ts > 14.18$, $ps < .001$.

Table 2 presented the dependent variables' scores across conditions.

CHAPTER 4: DISCUSSION

Overall, study 1 suggested that exposure to nostalgic messages can induce self-affirmation measured with the self-affirmation scale. For both induction methods, affirmed participants were more likely to experience the feeling of self-affirmation than those in the control condition. Moreover, participants exposed to the nostalgic message reported a score of self-affirmation significantly above the mid-point.

In comparison, when perceived self-affirmation was measured with the self-integrity scale, there was no evidence indicating scores differed among the four conditions. Furthermore, perceived self-affirmation scores were significantly above the mid-point across conditions. Inspections of these results and the item content suggested that the self-integrity scale may rather measure a global, stable self-evaluation (e.g., self-esteem) instead of an active affirmation of some important aspect of one's self-concept. As self-affirmation inductions maintain or restore (rather than maximize) a global positive self-evaluation after a threat, no differences in self-integrity scores should be expected when such a threat is absent (McQueen & Klein, 2006).

Because study 1 provided evidence that exposure to nostalgic messages can serve as a self-affirmation induction, study 2 adopts this induction and proceeds to examine the moderating effect of argument strength on the effectiveness of self-affirmation.

CHAPTER 5: METHOD OF STUDY 2

Study 2 is a 2 (self-affirmation: nostalgia message vs. control message) \times 2 (argument strength: strong vs. weak) between group experiment. The mediators include other-directed emotions, perspective of self-identities, and defensive processing. The dependent variables are attitude and intention to reduce consuming caffeinated beverages. The covariates in the study involve trait reactance, perceived health status, prior knowledge about caffeinated beverages, and fear. People high in trait reactance are more likely to generate negative responses to persuasive attempts (Nan & Zhao, 2012). Prior knowledge about caffeinated beverages and perceived health status are included because these variables affect people's attitude toward caffeine intake and dietary behaviors (Guiry & Bisogni, 1986; Lu, Samuels, & Huang, 2002). To control fear produced by exposure to messages with different argument strength, this emotion was also measured.

Participants

Seven hundred and twenty one participants⁵ were recruited through a post on the SONA participant pool of the College of Communication Arts and Sciences, an email distributed to undergraduate students from the same university, and announcements to students enrolled in the summer courses offered by the Department of Communication⁶. Twenty five responses were removed due to duplicates. Furthermore, a set of prescreening questions asked whether or not

⁵ Based on the effect size of self-affirmation on message acceptance (.13) reported in previous studies (Nan & Zhao, 2012; Sweeney & Moyer, 2015) and an estimated power of .8, the minimum number of participants to detect the statistical difference is 466. Because this study focuses on regular drinkers of caffeinated beverages and 75% of college students reported belonging to this group in a pilot test, the study recruited more participants to start with.

⁶ Specifically, 405 participants were recruited from the university, 108 participants were recruited from SONA, and 208 participants were recruited from summer courses. Of the final sample for analysis, 240 participants were recruited from the university, 102 participants were from SONA, and 123 participants were from summer courses. A series of one-way analysis of variance showed no evidence for the differences among recruitment methods in perspective, other-directed emotion, anger, derogation, message manipulation, negative thoughts, and attitude, $F_s(2, 459) < 1.75, p_s > .17$. However, there was a difference in intention among participants recruited from the three sources, $F(2, 459) = 4.18, p = .016$. Hence, recruitment was included as a covariate for intention in hypothesis testing.

participants consumed caffeinated beverages (i.e., coffee, tea, energy drinks, or soda/pop) on a daily basis. Only people who reported to be regular drinkers of caffeinated beverages were included for analysis. After excluding those who did not meet the criterion, the sample consisted of 465 participants. Of this sample, 69.68% were female ($N = 324$). The majority of the participants reported to be Caucasian (78.71%), followed by Asian/Asian American (10.11%), African/African American (7.74%), Hispanic (2.37%), and other ethnicities (1.08%). The sample consisted of 1.72% freshmen, 10.32% sophomores, 33.76% juniors, 51.18% seniors, and 3.23% people from other grades. Due to a survey construction error, the questionnaire sent to a part of participants recruited from summer courses did not include age as a demographic question. The researcher attempted to contact these participants for demographic information. Among the participants who responded this question ($N = 429$), the average age was 21.20 ($SD = 3.13$).

Procedures

Participants received a link to the survey on Qualtrics. After they consented to take the study, a cover story told participants that the purpose of the study was to pilot test a campaign message targeting at reducing people's caffeine consumption. In the next page, the survey instructed participants to listen to an audio to relax and get familiar with the research setting. In actuality, the audio was the self-affirmation induction developed in study 1. Two hundred and thirty participants were randomly assigned to hear a nostalgic audio, and two hundred and thirty-five participants were assigned to an audio about changing car oil (i.e., the control condition). Although many tasks (e.g., writing food consumed, reflecting on others' achievement) have been used as control conditions to examine the self-affirmation effect, the audio task used in study 1 was chosen to ensure the comparability between the control and the experiment conditions. Following listening to the radio and completing questions about other-directed emotion and

perspective of the self, participants were randomly assigned to read one of two messages varying in argument strength ($N = 231$ for the weak message, and $N = 234$ for the strong message). After the message exposure, participants answered a questionnaire assessing defensive processing, attitude, and intention to reduce caffeine consumption.

Argument Strength Induction

The message presented three reasons for reducing the consumption of caffeinated beverages (see Appendix F). Argument strength was induced by varying the validity and relevance of the evidence and the presence of syllogism fallacies. For example, the strong message provided fact-based evidence to support the adverse effect of caffeine consumption (e.g., extra calories resulting from consuming caffeinated beverages), whereas the evidence in the weak message was opinion-based (e.g., frequent use of restrooms if drinking caffeinated beverages). Also, given caffeine consumption is a health topic, the strong message featured more relevant, health-related evidence to support the claim, whereas the weak message used less relevant evidence (e.g., environmental consequences of drinking caffeinated beverages). Furthermore, the weak message contained logical fallacies such as the genetic fallacy (e.g., “Since the discovery of coffee beans in Ethiopia, coffee was a symbol of sin, colonial exploitation, and slavery. ... Today, anyone who consumes caffeinated beverages is inhumane and ignorant of the social history of coffee.”), whereas the strong message contained none.

Four pilot tests examined the argument strength induction. The sample size for the four waves of pilot tests was 101 (31 males, 69 females, 1 sex unidentified, $M_{age} = 20.10$, $SD_{age} = 2.20$), 60 (27 males, 33 females, $M_{age} = 20.18$, $SD_{age} = 1.54$), 23 (19 males, 4 females, $M_{age} = 20.48$, $SD_{age} = 1.50$), and 50 (7 males, 43 females, $M_{age} = 23.04$, $SD_{age} = 3.42$) respectively. The first three rounds of pilot tests examined the perceived strength for each individual argument,

whereas the fourth pilot test compared the strong vs. the weak message with each containing three arguments. Specifically, the first pilot test conducted a 2×4 mixed group experiment with the first independent variable as the between groups factor (i.e., argument strength) and the second independent variable as the repeated factor (i.e., argument). The results indicated one of the strong arguments and three of the weak arguments were not induced as intended. In the second and third pilot tests, the researcher focused on weak arguments, revised these arguments with reiterations, and identified three arguments yielding the lowest ratings on argument strength. Based on a between groups experiment, the fourth pilot test checked the induction of the strong vs. the weak message. The study adopted and modified a scale developed by Nabi (2002) and a scale used by Klein, Harris, Ferrer, and Zajac (2011) to measure argument strength. The items were measured with 5-point scales. Independent t-tests showed participants perceived the strong message to be stronger than the weak message, $t_s(48) > 3.44$, $p_s < .001$, $r_s > .44$. See Table 3 for descriptive statistics for argument strength across four rounds of pilot tests.

Measures

Other than negative thoughts and constructs measured by semantic differential scales, all measures were rated on 7-point scales so that higher scores represented more of that construct.

Induction check. As in the pilot tests, the study assessed argument strength with the scale developed by Klein et al., (2011) and Nabi (2002). Klein's et al. (2011) scale consisted of four items ($M = 4.70$, $SD = 1.27$, $\alpha = .88$.), including "There is a strong association between caffeine consumption and the risk mentioned in the article you just read", "Reducing consuming caffeinated beverages is justified on the basis of the article that you just read", "The evidence (mentioned in the article) linking caffeine consumption and potential problems is reliable", and "Given the article that you just read, the consumption of caffeine drinks should be reduced." The

study also adopted four items developed by Nabi (2002) and added two items to evaluate the effectiveness of the argument strength induction, $M = 3.42$, $SD = 0.93$, $\alpha = .88$. Participants were asked to rate the extent to which the message they read was “unreasonable/reasonable”, “compelling/not compelling”, “strong/weak”, “unintelligent/intelligent”, “unconvincing/convincing”, and “unpersuasive/persuasive”.

Study 2 did not evaluate the self-affirmation induction. Previous research indicated that measuring self-affirmation after the induction can be reactive - even answering simple questions about the self can affirm people’s self-concept (Zhao & Nan, 2010). By having an induction check of self-affirmation, it would be difficult to differentiate whether the effect on persuasion outcomes, if any, results from the induction or the induction check. Furthermore, given the effect size of the nostalgic message on perceived self-affirmation in study 1, the induction showed promise for subsequent research.

Negative thoughts. Following recommendations from previous research (Dillard & Shen, 2005; Nan & Zhao, 2012), this study employed the thought-listing technique to evaluate participants’ negative thoughts. Participants were instructed to type one thought into each line for whatever thoughts they had about the health message. After reporting their thoughts, participants were asked to code whether each of the thoughts was favorable, unfavorable, neutral, or irrelevant to the topic or the message they just read. The number of thoughts rated as unfavorable served as the index of negative thoughts, $M = 0.26$, $SD = 0.38$.

Message manipulation. This study adopted three items from previous research to measure perceived message manipulation by asking participants the extent to which the message tries to manipulate their feelings, and makes them feel “manipulated” or “exploited” (Nan & Zhao, 2012; Shen, Monahan, Rhodes, & Roskos-Ewoldsen, 2009), $M = 3.26$, $SD = 1.38$, $\alpha = .88$.

Message derogation. This study adopted four items from previous research to measure message derogation by asking participants the extent to which they thought the message was “exaggerated”, “distorted”, “overstated”, and “overblown” (Nan & Zhao, 2012; Shen et al., 2009), $M = 3.90$, $SD = 1.46$, $\alpha = .94$.

Anger⁷⁸. Anger was evaluated by four items developed by Dillard and Peck (2000), $M = 3.04$, $SD = 1.35$. Participants were asked the extent to which the anti-caffeinated beverage message made them feel “irritated”, “angry”, “annoyed”, and “aggravated”.

Other-directed emotions. Participants indicated the extent to which they felt six other-directed emotions ($M = 4.02$, $SD = 1.53$, $\alpha = .93$), which included “love”, “caring”, “empathic”, “connected”, “sympathy”, and “grateful” (Crocker et al., 2008).

Perspective. Perspective of the self was assessed by a six-item scale developed by Critcher and Dunning (2015), $M = 4.07$, $SD = 1.47$, $\alpha = .95$. Participants were asked the extent to which exposure to the radio message “made me think of one or more aspects of myself,” “focused on one or more aspects of my identity,” “led me to identify one or more identities,” “prompted me to identify additional aspects of my identity,” and “led me to appreciate I have multiple parts of who I am.”

Attitude. Attitude was measured by seven items from Crites, Fabrigar, and Petty (1994), $M = 3.88$, $SD = 0.79$, $\alpha = .88$. Participants were asked to report their attitude toward limiting caffeine consumption as “bad-good”, “wise-unwise”, “worthwhile-not worthwhile”, “negative-positive”, “unfavorable-favorable”, “necessary-unnecessary”, and “not beneficial-beneficial”.

⁷ The items measuring anger were not linearly related and formed a Guttman Simplex scale.

⁸ One might expect anger, message manipulation, negative thoughts, and derogation to form a secondary-order unidimensional factor “defensiveness”. However, the data were inconsistent with the model because: 1) negative thoughts did not correlate strongly with other “defensiveness” indicators; and 2) message manipulation and derogation incurred large residuals with intention and argument strength items, which violated the parallelism theorem.

Intention. This study evaluated the intention to reduce caffeine consumption by five items developed by previous studies (Nestler & Egloff, 2010; van Koningsbruggen et al., 2009), $M = 3.94$, $SD = 1.64$, $\alpha = .96$. These items include “I intend to cut down my every day caffeine consumption”, “I am convinced that I will reduce the amount of caffeine I consume every day”, “I am going to reduce my every day caffeine consumption”, “I want to decrease my caffeine consumption”, and “How likely is it that you will intake fewer caffeine beverages every day?”

Trait reactance. This study assessed trait reactance using a 12-item scale developed by Hong and Faedda (1996), $M = 3.91$, $SD = 0.80$, $\alpha = .82$. Sample items include “I became frustrated when I am unable to make free and independent decisions” and “I resist the attempts of others to influence me.”

Fear. Participants reported the extent to which the exposure to the article made them feel “afraid,” “fearful,” “scared,” and “anxious” ($M = 2.60$, $SD = 1.35$, $\alpha = .95$).

Perceived health status. Perceived health status were measured by a single item “Would you say your health in general is?” The responses include “poor”, “fair”, “good”, “very good”, and “excellent” ($M = 3.51$, $SD = 0.81$) (Ware et al., 1980).

Caffeinated beverage consumption. This study asked participants to check whether or not they consume caffeinated beverages including coffee, tea, energy drinks, or pop/soda on a regular basis ($M_{type\ of\ caffeinated\ beverages} = 1.56$, $SD = 0.75$). If participants reported to be regular drinkers, the study prompted them to indicate the daily amount of beverage intake.

Prior knowledge about caffeine. This study adopted the test of caffeine knowledge from Bergman, Erickson, and Boyungs (1991). The test asked participants to answer questions related to the content of caffeine in different products, the duration of the effects of caffeine, and the recommended level of caffeine intake. A sample item is “Coffee is a stimulant.” One point was

awarded to a correct answer, and the average score across all questions represented people's prior knowledge about caffeine⁹ ($M = 0.62$, $SD = 0.16$). See Appendix G for the questionnaire of study 2.

Analysis Strategies

Preliminary analyses. A confirmatory factor analysis were conducted to examine the content validity of all major variables using both the centroid estimate in lessR and the maximum likelihood estimates in AMOS. Under the maximum likelihood estimate, standards for a good model fit include Comparative Fit Index ($CFI \geq .95$), Root Mean Square Error of Approximation ($RMSEA \leq .06$), and Standardized Root Mean Square Residual ($SRMR \leq .05$). Standards for an acceptable model fit include $CFI \geq .90$, $RMSEA \leq .08$, and $SRMR \leq .08$ (Hu & Bentler, 1999). Items yielding substantial error terms were dropped for subsequent analyses.

Additionally, a two-way ANOVA in SPSS were conducted to check the induction success. Specifically, personal nostalgic message and argument strength inductions were entered as the independent variables, and perceived argument strength was entered as the dependent variable.

Multiple regressions were conducted to determine the inclusion of covariates. The covariates were included in the hypothesis testing if these variables substantially affected defensiveness, attitude, intention, perspective of the self, or other-directed emotions.

Hypothesis testing. To investigate the effect of argument strength and self-affirmation on persuasion outcomes and its underlying process, the study analyzed the data in three steps. First, a series of two-way Analyses of Covariance (ANCOVA) were performed to examine the effect of self-affirmation and argument strength on four defensiveness variables, attitude, and

⁹ The items of the knowledge scale were not linearly related to the true score but instead formed a Guttman Simplex scale.

intention. Second, two independent group t-tests were conducted to test the effect of self-affirmation on other-directed emotions and perspectives of self-identities. Furthermore, to examine the process that self-affirmation affected persuasion outcomes under different levels of argument strength, the study split the data based on the argument strength induction and conducted a path analysis for each condition separately. To the extent that the data were consistent with the hypotheses, the path coefficients should be ample, and the model should demonstrate at least an adequate fit.

CHAPTER 6: RESULTS OF STUDY 2

Confirmatory Factor Analysis

Other than anger, the major variables predicted in the hypothesized paths and manipulation checks were tested in a confirmatory factor analysis. After reiterations of removing items incurring large residuals¹⁰, the measurement model achieved a good fit, $CFI = .96$, $NFI = .92$, $RMSEA = .05$, $SRMR = .04$. Table 4 summarized descriptive statistics and correlations among major variables tested in the hypotheses. Table 5 presented the scores of major variables across different experimental conditions.

Manipulation Checks

The results of a two-way ANOVA showed the success of the argument strength induction. Specifically, the argument strength induction had a main effect on the perceived argument strength measured by Nabi's scale, $F(1, 461) = 84.90, p < .001, \eta^2 = .15, r = .39$, and Klein's et al. (2011) scale, $F(1, 461) = 111.76, p < .001, \eta^2 = .19, r = .44$. Participants who read the strong message ($M_{Nabi} = 3.78, SD_{Nabi} = 0.68$; $M_{Klein} = 5.25, SD_{Klein} = 0.96$) perceived the message to be stronger than those who read the weak message ($M_{Nabi} = 3.05, SD_{Nabi} = 1.00$; $M_{Klein} = 4.14, SD_{Klein} = 1.28$). Also, when the perceived argument strength was measured with Nabi's scale, there was no evidence for a main effect of self-affirmation induction, $F(1, 461) = 0.34, p = .56, \eta^2 = .00, r = .02$, or a self-affirmation \times argument strength induction effect, $F(1, 461) = 3.49, p = .062, \eta^2 = .01, r = -.10$. The same patterns were observed for Klein's et al. scale regarding the effect of self-affirmation, $F(1, 461) = 0.10, p = .92, \eta^2 = .00, r = .00$, and the interaction effect, $F(1, 461) = 1.73, p = .25, \eta^2 = .00, r = -.05$.

¹⁰ The study dropped one item from argument strength, two from attitude, and one from perceived message manipulation scales respectively. They were "The article that you just read was strong/weak.", "Reducing the consumption of caffeinated beverages is unnecessary/necessary", and "Reducing the consumption of caffeinated beverages is wise/unwise.", and "The article tries to manipulate my feelings."

Inclusion of Covariates

The study conducted a series of multiple regressions to examine whether fear, trait reactance, knowledge, and perceived health status predicted the major variables in the hypotheses. The results revealed that fear predicted anger ($\beta = .25, t = 5.70, p < .001$), message manipulation ($\beta = .28, t = 6.29, p < .001$), negative thoughts ($\beta = -.30, t = -5.91, p < .001$), and intention ($\beta = .26, t = 5.59, p < .001$). Also, trait reactance positively predicted anger ($\beta = .28, t = 6.39, p < .001$), perceived message manipulation ($\beta = .20, t = 4.41, p < .001$), and derogation ($\beta = .15, t = 3.23, p < .001$). Therefore, these significant predictors were included in the hypotheses testing when the endogenous variables were their outcome measures.

Hypothesis Testing

First, this study conducted six ANCOVAs to investigate the effect of argument strength and self-affirmation on the major outcome variables. In terms of anger, the results demonstrated a main effect of argument strength, $F(1, 458) = 38.76, p < .001, \eta^2 = .06, r = -.25$. Specifically, participants who read the strong message ($M = 2.80, SD = 1.22$) were less likely to feel anger than those who read the weak message ($M = 3.29, SD = 1.43$). However, no evidence suggested a main effect of self-affirmation, $F(1, 458) = 0.42, p = .52, \eta^2 = .00, r = -.03$, or an interaction between argument strength and self-affirmation, $F(1, 458) = 3.03, p = .08, \eta^2 = .01, r = -.07$.

Regarding derogation, the results showed a main effect of argument strength, $F(1, 459) = 58.23, p < .001, \eta^2 = .11, r = -.33$. Participants who were in the strong message condition ($M = 3.43, SD = 1.24$) reported lower scores in derogation than those in the weak message condition ($M = 4.38, SD = 1.50$). However, there was no evidence indicating a main effect of self-affirmation, $F(1, 459) = 0.00, p = .95, \eta^2 = .00, r = .00$, or an argument strength \times self-affirmation effect, $F(1, 459) = 1.42, p = .23, \eta^2 = .01, r = -.05$.

In terms of negative thoughts, the results demonstrated that argument strength had a main effect, $F(1, 459) = 35.32, p < .001, \eta^2 = .07, r = -.26$. That is, participants who read the strong message ($M = 0.14, SD = 0.28$) reported fewer negative thoughts than those who read the weak message ($M = 0.38, SD = 0.43$). However, there was no evidence for a main effect for self-affirmation, $F(1, 459) = 0.48, p = .49, \eta^2 = .00, r = -.03$, or an interaction between self-affirmation and argument strength, $F(1, 459) = 0.54, p = .46, \eta^2 = .00, r = -.03$.

Regarding perceived message manipulation, there was a main effect of argument strength, $F(1, 457) = 8.52, p = .004, \eta^2 = .02, r = -.13$. Specifically, participants who read the strong message were less likely to perceive the message to be manipulating ($M = 3.19, SD = 1.26$) than those who read the weak message ($M = 3.34, SD = 1.49$). However, no evidence indicated a main effect for self-affirmation, $F(1, 457) = 2.04, p = .15, \eta^2 = .00, r = .06$, or an interaction between argument strength and self-affirmation, $F(1, 457) = 0.12, p = .73, \eta^2 = .00, r = .00$.

In terms of attitude, the results revealed a main effect of argument strength, $F(1, 460) = 5.08, p = .03, \eta^2 = .01, r = .10$. Specifically, participants in the strong message condition ($M = 3.96, SD = 0.81$) were more likely to have positive attitudes toward reducing the consumption of caffeinated beverages than those in the weak message condition ($M = 3.79, SD = 0.77$). Again, there was no evidence for a main effect of self-affirmation $F(1, 460) = 2.11, p = .15, \eta^2 = .00, r = -.07$, or an interaction between self-affirmation and argument strength, $F(1, 460) = 0.02, p = .89, \eta^2 = .00, r = .00$.

As for intention, there was a main effect for argument strength, $F(1, 459) = 8.14, p = .005, \eta^2 = .02, r = .13$. Specifically, participants who read the strong message ($M = 4.23, SD = 1.54$) were more likely to report intentions to reduce the consumption of caffeinated beverages than those who read the weak message ($M = 3.63, SD = 1.67$). However, there was no evidence

indicating a main effect for self-affirmation, $F(1, 459) = 1.46, p = .23, \eta^2 = .00, r = -.05$, or an interaction between self-affirmation and argument strength, $F(1, 459) = 0.57, p = .45, \eta^2 = .00, r = -.03$.

Furthermore, two independent t-tests were conducted to examine the effect of the self-affirmation induction on other-directed emotions and perspectives of self-identities. Because the predicted effects did not differ by argument strength, this study used the whole sample for analysis. The results demonstrated that participants who listened to the nostalgic affirmation audio ($M = 0.80, SD = 1.16$) had a broader perspective of the self than those in the control condition ($M = -0.80, SD = 1.31$), $t(456.18) = 13.80, r = .54, p < .001$. Additionally, participants who listened to the nostalgic audio ($M = 0.86, SD = 1.21$) reported greater other-directed emotions than those in the control condition ($M = -0.86, SD = 1.34$), $t(457.40) = 14.39, r = .56, p < .001$.

Moreover, to investigate the process through which self-affirmation affected attitude and intention under different levels of argument strength, the study tested the paths depicted in Figure 2 and 3 for the strong and weak message condition separately. It is expected that when people read a strong message, self-affirmation would generate other-directed emotions and broader perspectives of self-identities, which then would decrease defensiveness and further promote positive attitudes and intentions. A path analysis showed that for those who were in the strong message condition, self-affirmation positively affected other-directed emotions ($r = .58, p < .001$) and perspectives of self-identities ($r = .55, p < .001$). However, there was no evidence for the effect of other-directed emotions on negative thoughts ($\beta = .01, p = .88$), anger ($\beta = .06, p = .33$), derogation ($\beta = .07, p = .33$), and perceived message manipulation ($\beta = .07, p = .30$). Also, there was no evidence indicating the effect of perspectives of self-identities on negative thoughts

($\beta = -.04, p = .57$), anger ($\beta = -.03, p = .64$) and derogation ($\beta = .04, p = .54$). Although perspectives predicted perceived message manipulation ($\beta = .13, p = .05$), the positive association was opposite to the prediction. Additionally, anger ($\beta = -.27, p < .001$) and derogation ($\beta = -.18, p = .003$) were negatively associated with attitude, whereas there was no evidence for the effect of perceived message manipulation ($\beta = .08, p = .21$) and negative thoughts ($\beta = -.11, p = .09$) on attitude. Furthermore, attitude positively influenced intention ($\beta = .45, p < .001$).

For those who read a weak message, the study predicted that self-affirmation would result in greater other-directed emotions and more diverse perspectives of self-identities, which then would increase defensiveness and further decrease positive attitudes and intentions. The results of a path analysis showed that for those who were in the weak message condition, self-affirmation promoted other-directed emotions ($r = .55, p < .001$) and expanded perspectives of self-identities ($r = .55, p < .001$). Other-directed emotions increased perceived message manipulation ($\beta = .16, p = .01$), but no effect was observed for negative thoughts ($\beta = -.10, p = .15$), anger ($\beta = -.10, p = .11$), or derogation ($\beta = .02, p = .72$). Also, no evidence suggested perspectives influenced negative thoughts ($\beta = -.00, p = .98$), anger ($\beta = -.05, p = .46$), derogation ($\beta = -.05, p = .52$), or perceived message manipulation ($\beta = -.06, p = .39$). Anger decreased participants' attitude toward reducing the consumption of caffeinated beverage ($\beta = -.14, p = .03$), but there was no evidence indicating the effect for negative thoughts ($\beta = -.08, p = .22$), derogation ($\beta = -.10, p = .14$), or perceived message manipulation ($\beta = .01, p = .83$). When participants had a positive attitude toward decreasing the intake of caffeinated beverages, they tended to report a stronger intention to adopt the message recommendation ($\beta = .40, p < .001$). Table 6 summarizes the path coefficients for the weak and strong message conditions.

Because most of the effects of other-directed emotions and perspectives on defensiveness were within sampling error of zero, the data were inconsistent with the hypothesized model. As such, this study did not pursue examination of the model fit.

CHAPTER 7: DISCUSSION OF STUDY 2

Study 2 did not show evidence for the idea that argument strength could moderate the effect of self-affirmation on persuasion outcomes. Although self-affirmation broadened perspectives and increased other-directed emotions, the associations between these two variables and three of the defensive reactions (i.e., negative thoughts, anger, derogation) were within sampling error of zero when participants read a weak message. Although perspectives of self-identities increased perceived message manipulation of the weak message as the model predicted, there was no evidence for the association between such a defensive response and attitude. Additionally, when participants read a strong message, there was no evidence indicating the effect of other-directed emotions on defensiveness, and the direction of the association between perspectives and perceived message manipulation was opposite to the prediction.

Furthermore, inconsistent with previous research that self-affirmation prior to message exposure could enhance the effectiveness of a subsequent persuasive attempt, this study did not observe direct effects of self-affirmation (induced by a nostalgic message) on defensiveness, attitude, and intention. Instead, only argument strength had main effects on defensive reactions, attitude, and intention. That is, compared to participants who read a weak message, those who read a strong message were less likely to report negative thoughts, anger, derogation, and message manipulation and were more likely to report positive attitudes and intentions to reduce the consumption of caffeinated beverages.

CHAPTER 8: GENERAL DISCUSSION

Previous research has repeatedly shown that self-affirmation can reduce people's defensiveness to and promote acceptance of a persuasive message (Epton et al., 2015; Sweeney & Moyer, 2015) especially when the message is strong (Correll et al., 2004; Klein et al., 2011). However, few research has examined the process through which self-affirmation can promote persuasion effectiveness when the message is strong. Moreover, despite the fact that self-affirmation has been shown to improve the success of persuasive attempts, such a technique is not communication-based and can be difficult to be implemented in natural settings. The current study expands this line of research by examining whether a communication-based strategy (i.e., exposure to a nostalgic message) can induce self-affirmation and whether this alternative strategy can boost the effectiveness of a strong persuasive message through the same mechanisms as traditional self-affirmation inductions.

Overall, this study provided evidence that exposure to a personal nostalgic message can serve as an alternative induction of self-affirmation. Specifically, study 1 showed that exposure to a nostalgic message could affirm people's self-concept just as a traditional self-affirmation induction (i.e., value ranking and essay writing). Furthermore, study 2 demonstrated that exposure to a nostalgic message could broaden people's view of the self and generate positive other-directed emotions as traditional self-affirmations do. These results were consistent with studies suggesting that recalling an idiosyncratic nostalgia event can affirm people's positive attributes and provide intrinsic resources to the self (Baldwin et al., 2015; Vess et al., 2012). Moreover, the current study extends previous research by explicitly testing self-affirmation perceptions as an outcome of nostalgia and showing that exposure to thematic nostalgia events featured in a message can also offer positive resources to the self. As nostalgia is closely related

to people's social memories, the fact that listening to a nostalgic video can elicit self-affirmation is consistent with the idea that reminding them of their interpersonal success is key to restoring the overall self-integrity (Sedikides et al., 2016). Additionally, the results contribute to the persuasion literature by showing the possibility of inducing self-affirmation with a communication-based strategy.

However, although a personal nostalgic message can function as a self-affirmation induction, no evidence indicated such an induction replicated the same persuasion outcomes produced by traditional self-affirmation inductions, such as checking value scales or writing essays about personal values. Specifically, previous research has shown that self-affirmation is more likely to enhance message acceptance when such a message features strong (vs. weak) arguments (Correll et al., 2004; Klein et al., 2011). Researchers suggested that self-affirmation can enable people to transcend the self (through broadening perspective of self-identities and experiencing other-directed emotions) to be open to threatening yet constructive information (Critcher & Dunning, 2015; Crocker et al., 2008). When people are open-minded, they tend to examine carefully the information value of the persuasive attempt. As such, people are likely to discern argument qualities, appreciate strong arguments, and doubt and reject weak ones. However, the current study did not find that argument strength interacts with perspectives of self-identities or other-directed emotions to reduce defensiveness. Additionally, the study also did not observe the main effects of self-affirmation on defensiveness, attitude, and intention. Instead, only argument strength had main effects on decreasing people's defensive reactions and increasing positive attitudes and intentions to reduce caffeine consumption.

There are at least three explanations for the null finding of the predicted interactions. First, because the participants included for analysis are all caffeine drinkers, they may perceive

the topic about reducing caffeine consumption relevant and thus scrutinize the persuasive message regardless of whether or not they were affirmed. As such, people are more likely to accept the message featuring strong (vs. weak) arguments (Johnson & Eagly, 1989).

Second, the items measuring defensiveness in the current study may not be sensitive enough to capture how message recipients evaluate the information value of the health risk message, which is seen as an indicator of whether or not people engage in defensive processing of the persuasive attempt (Good & Abraham, 2007). Specifically, three of the defensiveness measures (i.e., anger, perceived message manipulation, derogation) focus more on reactance, which is motivated by a need to maintain freedom of control (Dillard & Shen, 2005), rather than people's assessment of information values. Notably, in a study conducted by Klein and his colleagues (2011) that reported a relationship between the affirmation-by-argument strength interaction and defensive processing, the authors considered reduced defensiveness as more vulnerable feelings to the risk mentioned in the persuasive message, which can be considered as people's judgment of the risk information.

A third explanation is that the actual self-affirmation effect on persuasion outcomes is rather small and even within sampling error of zero, and the current study might just replicate such an effect. In the meta-analysis of Epton et al. (2015), the effect size for self-affirmation on intention is $r = .07$. Based on an average sample size of 87 for studies investigating intention¹¹, the standard error is .11, and the 95% confidence interval is $[-.15, .29]$. Additionally, in the meta-analysis of Sweeney and Moyer (2015), the effect size for self-affirmation on intention is $r = .13$ and the average sample size is 75, yielding a standard error of .11 and a 95% confidence interval of $[-.09, .35]$. Notably, the effect size of self-affirmation on intention in this study is $-.07$, falling

¹¹ The average sample size was calculated by dividing the total participants across different studies (reported in the meta-analysis) by the number of studies.

comfortably into the estimated confidence interval of previous research. As the average sample size for previous research on self-affirmation is small, it is possible that the reported self-affirmation effect may just reflect noises or random factors, and the lack of evidence for the effect of self-affirmation can be unsurprising. Future research can use a traditional self-affirmation induction to test whether the self-affirmation effect or its interaction with argument strength can be replicated.

The findings of this study provide theoretical implications for research on nostalgia, self-affirmation, and persuasion. Advertising research has shown personal nostalgic appeals in an ad can be a powerful tool to improve the message's persuasion outcomes (e.g., attitude toward the brand, purchase intention) (Chou & Lien, 2014; Muehling & Pascal, 2011 & 2012; Muehling & Sprott, 2004). The current research expands the scope by showing personal nostalgic messages can function as a self-affirmation resource (unrelated to the subsequent persuasive message) that potentially enhances the acceptance of such a message (Epton et al., 2015; Sweeney & Moyer, 2015). Additionally, past research indicates recalling nostalgic episodes or re-experiencing media contents from the past can provide self-directed, existential, and social resources for the self (Baldwin et al., 2015; Vess et al., 2008; Wulf, Rieger, & Schmitt, 2018). This study provides direct evidence that exposure to a nostalgic message (even though the nostalgic memories depicted may not be idiosyncratic) can function as self-affirmation. Furthermore, as a construct originated in the field of psychology, self-affirmation has been applied to enhance a subsequent message's effectiveness, but this intervention is usually behavioral- instead of communication-based. This study highlights that communication can play a central role in inducing self-affirmation by demonstrating the possibility of using a message-based strategy to maintain and

restore the global sense of self-image. Future research can explore how other communication-related strategies can also elicit the feeling of affirmation.

The study also carries practical implications for campaign professionals. Although traditional self-affirmation inductions have been shown to enhance the persuasiveness of health communication, those inductions require researchers instructing participants to check items scales or rank the importance of value items in experiment settings, which is impractical to be implemented in natural contexts. As exposure to a personal nostalgic message does not compel message recipients to engage in a cumbersome task and can function as a self-affirmation induction, such a strategy is more feasible to be applied in mass media campaigns. For example, campaign professionals can place a nostalgic message before the actual public service announcement to maintain people's overall self-integrity and enable them to be more open to the subsequent persuasive attempt. Admittedly, although exposure to a personal nostalgic message can act as a self-affirmation induction, such an induction did not replicate the persuasive outcome reported in previous studies using traditional self-affirmation methods. A careful examination of the effectiveness of a nostalgic message on reducing defensiveness is necessary before applying this self-affirmation intervention on a large scale. Additionally, the nostalgic message was not integrated with the subsequent health message, and this limitation creates an inconvenience that the induction must be placed adjacent to a health campaign message to harness the power of self-affirmation. Nevertheless, previous attempts to integrate a self-affirmation induction with a health risk message suggest that the effect size of such an induction tend to be relatively small (Arpan et al., 2017). Future research endeavors may seek to create a strong self-affirmation induction while simultaneously embedding such an induction within a health message to facilitate the application of self-affirmation.

As does other research, this study contains limitations. First, the personal message was developed based on nostalgic themes identified in a separate study, and thus the message may not be tailored to participants in the main study. Future research can examine whether or not the effect of nostalgic messages on self-affirmation is stronger when these messages reflect recipients' idiosyncratic experiences instead of merely featuring thematic nostalgic episodes. Second, the study only tested the argument strength of a single topic (i.e., reducing caffeine consumption) that dealt with preventing the risk of an unhealthy behavior. As the message challenges people's existing health behavior, they may perceive the message to be especially threatening and relevant to their health outcomes. Thus, people are more likely to engage in careful information processing and be persuaded by strong arguments (Johnson & Eagly, 1989). Future research can examine whether or not the findings may be different when a subsequent message focuses on promoting a healthy behavior. Third, the study only focused on caffeine drinkers and did not analyze data from non-drinkers who may perceive the issue of caffeine consumption to be less relevant. Because personal relevance can moderate the way message recipients process strong vs. weak messages (Johnson & Eagly, 1989) and the effectiveness of self-affirmation (Klein & Harris, 2009; Zhao, Peterson, Kim, & Rolfe-Redding, 2014), future studies can investigate the three-way interaction between caffeine consumption status, argument strength, and self-affirmation and its effect on message acceptance. Fourth, the arguments in the weak and strong message conditions may not be comparable. The strong message focused on undesirable health outcomes of drinking caffeinated beverages, whereas the weak message argued about social and environmental consequences of consuming caffeinated beverages. According to the subjective probability model (Wyer, 1975), argument strength is determined by 1) the probability whether the premise is true, and 2) given the premise is true, the probability

whether the premise leads to the conclusion. This study used different reasons to vary the second criterion. Given consuming caffeinated beverages is a health topic, it seems that arguments appeal to health reasons are more likely to support the conclusion than those appeal to other reasons. Future research may explore solutions that both keep the arguments constant in the strong and weak message and vary the probability that the premise supports the conclusion. For example, researchers can appeal to health and vary the probability that drinking caffeinated beverages leads to negative health outcomes, such as “Compared to non-drinkers, drinkers of caffeinated beverages are 80% (for a strong message)/10% (for a weak message).” Admittedly, this approach may induce fear as a confounding variable, but this variable can be controlled as a covariate.

CHAPTER 9: CONCLUSION

This study revealed that exposure to a personal nostalgic message can serve as an alternative induction of self-affirmation. However, although such an induction can generate positive other-directed emotions and broaden people's perspectives of self-identities, which are the psychological mechanisms of self-affirmation in previous literature, these cognitive and affective outcomes did not interact with argument strength of a subsequent persuasive message to reduce recipients' defensiveness. Instead, argument strength reduced defensive reactions and positively affected attitudes and intentions to reduce caffeine consumption. Because this study only focused on caffeine drinkers, it is possible that participants may view the issue to be personally relevant and scrutinize the information value of the health message. As such, strong arguments are more likely to be persuasive than weak ones regardless of whether or not the message recipients are affirmed, experience greater positive other-directed emotions, or obtain broader perspectives of the self. It is also possible that the measurements of anger, derogation, message manipulation, and negative thoughts may not be sensitive enough to capture the aspect of defensive process (e.g., dismissing the information value) that is critical to predicting persuasion outcomes. Another explanation is that the reported self-affirmation effect may just pick up random factors given the small sample size in each study, putting the replicability of the self-affirmation effect into question. Nevertheless, this study is a start to examine how social influence and message exposure can induce self-affirmation. The research on message-based induction of self-affirmation not only can expand the scope of the communication field but can also offer a feasible strategy to professionals to apply self-affirmation when launching a campaign in natural settings to enhance the effectiveness of persuasive attempt.

APPENDICIES

Appendix A: FORMATIVE SURVEY QUESTIONNAIRE

1. When you see the word “nostalgia”, what do you think about? What do you feel? Please describe your thoughts and feelings as specific as possible.
2. Please think of a past event or moment in your life that has personal meaning for you. This should be a moment that you think about in a **nostalgic** way. Specifically, please try to think of an important part of your past (e.g., event or moment) that makes you feel most **nostalgic**.

You may take a few minutes to think about your nostalgic experience. After that, please write down this experience in all its vivid detail and be as detailed, thorough, and descriptive as possible.

3. Are you _____ male _____ female _____ other (check one)? If you checked “other,” please explain.
4. What is your year in school?
_____ Freshman
_____ Sophomore
_____ Junior
_____ Senior
_____ Other (please explain)
5. How would you describe your ethnicity?
_____ African/African American
_____ Asian/Asian American
_____ Caucasian
_____ Hispanic
_____ Native American
_____ Other (please explain)
6. How old are you in years?

Appendix B: TRADITIONAL SELF-AFFIRMATION INDUCTION

Self-Affirmation Condition

Below are five general values, please rank these five values in terms of their personal importance to you (1 = the most personal important, 5 = the least personal important).

kindness, honesty, generosity, independence, and success

For the value that you identify as the most personal important, please down (a) the reasons why it was important to you and (b) a personal experience in which the value had proven important and made you feel good about yourself.

Control Condition ☐

Please list everything that you have eaten or drank in the past 48 hours in as much detail as they can. Do not need to worry about those things you are unable to remember.

Appendix C: ALTERNATIVE SELF-AFFIRMATION INDUCTION

Self-Affirmation Condition

Script (2:46):

A person's mind is at ease when remembering the past. This is when life was happier. I remember when I was a kid, surrounded by my mother and father, close to me, in our house. The very color of the air in the place we lived was different; the smell of the earth was special, scented with memories of my parents.

I miss being worry-free, the innocent days where all I did was think about eating, playing, and having fun. I miss the bowling night with my family when I was little. I miss the first time my family and I went to Disneyland, where we laughed, took rides, and had good pictures. We had a blast. I remember visiting my grandparents' wooden cabin on a beach in summers. There are vast sand dunes and roads that wind through tall trees. We would swim, boat, look under rocks, and find weird fish all day. I remember the Christmas time we get together, my grandparents' storytelling, and the smell of fried dough and cinnamon coming off the stove. I never felt poor; I had the feeling that I could always get money from my dad if I needed it for an ice cream. I remember my cousin's birth. I remember my sister's wedding, the bright colors, and the music. I remember my entire family would head down to Detroit together for a sport's game. I remember the very first Michigan state game I went to with my friends. I remember the time my team and I won the little league champion, and I gave my dad and mom a hug.

I miss having life so simple that the only thing I would care about is how long I could play outside with friends before running home in time for dinner. I miss going for long bike rides with my friends. I miss the feeling that life would go on and on. I miss watching the clouds drifting by on a beautiful day in the springtime. I remember my first crush when I was in high school. I miss recess in elementary school. I miss walking back from school with my best friends and playing video games. I miss my classmates, my old backpack, my lunch box, and my favorite teachers. I miss the day I graduated, walking across the stage and seeing everyone having the most gleeful smile. I miss sitting at a bonfire at the beach, singing, and looking at stars with my friends.

I could go on forever. Life was beautiful!

All of my sweet memories will never be forgotten, and they are filled with thoughts that are so familiar. The past has been both bitter and sweet, and it makes me the person who I am.

Control Condition

Script (2: 52):

Changing your own oil can be a quick and easy way. To make sure that you get the quality oil that you want and to make sure that the job is done right, it only takes a few basic tools and a pair of gloves. And it's recommended that you change your oil every three months or every three thousand miles. I've saved about one hundred fifty dollars a year by doing it myself so let's get started.

The first thing in any project is safety. So always park on a level surface and make sure that the parking brake is engaged. In this case, jack the car up and put it on jack stands so that you can just get a better look at what I'm doing. But if you have a vehicle like an S.U.V. with a higher ground clearance this probably won't be necessary. Now I like to wear latex gloves when I'm working on my vehicle. It just helps keep my hands clean. Before draining the old oil, I'm going to remove the filler cap. It just helps it flow better.

The oil drain plug is located right here. Just put your wrench on the plug and turn it left. Remember righty tightly lefty loosely. Be sure to use a wrench that fits using pliers. Wrench that doesn't fit can damage the plug and it can cause a real pain down the road. Now let's let the old drain for about fifteen minutes.

Now put the plug back in the pan. And tightness so that snug the don't overtighten. Now you're ready to change the oil filter in most vehicles located near the oil pan but in the newer vehicles sometimes right under the hood. To make the job easier, you may want to use a tool called an oil filter wrench though they make a lot of different kind. This one is the one I prefer because it is taxes right to my ratchet and is specific for my oil filter. To remove it, just slide the wrench over the filter and turn and watch out for the dripping oil.

Before you put the new filter on there are a couple of things I'd like to recommend with a little oil on your finger. Rub it around the gasket of the filter. Not only does this make for a better seal and help prevent leaks but will make it a little easier to remove the filter at your next oil change.

Next I like to pour some fresh oil into the filter. It helps keep it from being dry. The next time you start the engine when put in the filter back on be careful not to cross the road or to overtighten. And you really don't need the wrench when putting it back on. Just use your hands and screw it all until a snug and then go another half turn.

Now ready to add the fresh oil, but before you go shopping make sure to check your owner's manual for the weight of the oil your vehicle requires and the quantity that you need. Now start the car and let it run for a few minutes to get the new oil up into the engine. One final step you want to take is to go buy Advance Auto Parts and pick up one of these free stickers on it you can record the next service date three months from now as well as the next service mileage

and then you can place it on the windshield of your car to remind you of when your next oil changes due.

Appendix D: PILOT STUDY QUESTIONNAIRE FOR STUDY 1

1. Nostalgia

The audio reminds me of...

Good times from my past.

When I was young.

My childhood days.

Memories of being a kid.

A pleasant reminder of my past.

Memories of good times from my past.

2. Are you _____ male _____ female _____ other (check one)? If you checked "other," please explain.

3. What is your year in school?

_____ Freshman

_____ Sophomore

_____ Junior

_____ Senior

_____ Other (please explain)

4. How would you describe your ethnicity?

_____ African/African American

_____ Asian/Asian American

_____ Caucasian

_____ Hispanic

_____ Native American

_____ Other (please explain)

5. How old are you in years?

Appendix E: STUDY 1 QUESTIONNAIRE

1. Self-Affirmation

The audio/essay made me...
Think about positive aspects of self.
Focus my attention on who I am.
Aware of things I value about myself.
Think about things personally important to me.
Think about my values.

2. Self-Integrity

I have the ability and skills to deal with whatever comes my way.
I feel that I'm basically a moral person.
On the whole, I am a capable person.
When I think about the future, I'm confident that I can meet the challenges that I will face.
I try to do the right thing.
I am a good person.
Even though there is always room for self-improvement, I feel a sense of completeness about who I fundamentally am.
I am comfortable with who I am.

3. Are you ____ male ____ female ____ other (check one)? If you checked "other," please explain.

4. What is your year in school?

____ Freshman
____ Sophomore
____ Junior
____ Senior
____ Other (please explain)

5. How would you describe your ethnicity?

____ African/African American
____ Asian/Asian American
____ Caucasian
____ Hispanic
____ Native American
____ Other (please explain)

6. How old are you in years?

Appendix F: ARGUMENT STRENGTH INDUCTION

Strong Message

The most common sources of caffeine are tea, coffee, energy drink (e.g., red bull, monster), and soda. Caffeine has been called into question time and time for its unwanted effects.

Taking too much caffeine could result in short-term health risks. Based on a review of 35 studies with a combined sample of 37,890, a paper published in the British Medical Journal in 2017 reports that excessive caffeine intake results in symptoms similar to taking too much of a stimulant drug, with overdoses causing anxiety/agitation, convulsions, and tremors. People admitted to hospital after taking large amounts of caffeine typically have fast heartbeat and high blood pressure. Additionally, a common feature of caffeine overdose is vomiting, which can be very severe. Other gastrointestinal problems such as diarrhea and stomach pains have also been reported.

Additionally, caffeine drinks, such as coffee, tea, acidic and sweet energy drinks, or sodas, can stain teeth, erode tooth enamel, and cause tooth decay. Like any drink that isn't water, coffee helps the bacteria in your mouth to create acids that can lead to tooth and enamel erosion. As a result, your teeth become thinner and more brittle and the effect can be cumulative over time. Additionally, even just one cup of coffee or tea a day can begin staining your teeth. As Victoria Veystman, DDS, a professor at Stanford University explains, coffee and tea contain ingredients called tannins. Tannins are a type of polyphenol that break down in water. According to Dr. Veystman, tannins cause color compounds to more readily stick to your teeth. When these compounds stick, they can leave an unwanted yellow hue behind.

Furthermore, unless you drink your coffee black, caffeinated beverages generally add empty calories to our diets that we don't really need. Sugary beverages are a huge component of the obesity epidemic plaguing the western world. For example, quitting just a habit of one Monster energy drink/day saves 200 calories on a daily basis, 1,400 calories a week, or 73,000 calories a year (equivalent to 21 pounds of fat). Quitting just one Starbucks Vanilla Latte/day saves 250 calories per day, 1,750 calories a week, or 91,250 calories a year (equivalent to 25 pounds of fat). A study from the Harvard University found that when caffeine is in a sugary beverage, this substance causes people to consume more of that sugary beverage compared to a sugary beverage without caffeine.

Because of the above reasons, consider slowly reducing your intake of caffeine drinks. For example, if you drink two cups of caffeine beverages (e.g., coffee, pop, tea, energy drinks) a day, try and eliminate the 2nd cup. Maybe find a different healthy drink that you really enjoy. Drink this at the usual time you'd have the 2nd caffeine drink, and that'll help quench your thirst.

Weak Message

The most common sources of caffeine are tea, coffee, energy drink (e.g., red bull, monster), and soda. Caffeine has been called into question time and time for its unwanted effects.

Since the discovery of coffee beans in Ethiopia, coffee was a symbol of sin, colonial exploitation, and slavery. In the late 17th Century, caffeine drinks suddenly achieved enormous popularity in Europe, and Europeans started to implement systems of mass production in areas like Haiti. Under French rule, Haiti became particularly affluent from the booming coffee and sugar trade. The heightened demand for these products required additional labor, leading to the importation of African slaves to work on coffee plantations. Today, anyone who consumes caffeinated beverages is inhumane and ignorant of the social history of coffee.

Being addicted to coffee, energy drinks, or soda creates inconvenience in our lives. Caffeinated beverages cause us to urinate more often. This can be challenging during meetings, road trips, or when bathrooms aren't convenient. Additionally, if we drink fewer or quit caffeine beverages, our lives can be much simpler. Imagine that you never have to stop at Starbucks on the way to work. Imagine that you never have to stop by the convenience store for a red bull. Imagine that you can erase making coffee from your morning routine and save a couple of minutes for sleeping more. Imagine a backpacking trip without packing caffeine pills or the extra weight of coffee making equipment.

The production of caffeinated beverages consumes energies and generates a large amount of carbon emissions. For example, the roasting machines are primarily run off natural gas that is not efficient at all. Also, most cafes run from early in the morning till late in the evening, and thus their immense number of electronics and machines are running all day long. The incredible number of different machines and gizmos that are needed in a café all use an immense amount of energy. The blenders, grinders, brewers, refrigerators, freezers, espresso machines, cash register etc. all of these different appliances are constantly draining energy, and that's not even counting all the electricity being consumed at the front end of the store between all the phones and computers being charged to simply keeping the lights and air conditioning going.

Because of the above reasons, consider slowly reducing your intake of caffeine drinks. For example, if you drink two cups of caffeine beverages (e.g., coffee, pop, tea, energy drinks) a day, try and eliminate the 2nd cup. Maybe find a different healthy drink that you really enjoy. Drink this at the usual time you'd have the 2nd caffeine drink, and that'll help quench your thirst.

Appendix G: STUDY 2 QUESTIONNAIRE

1. Caffeinated Drink Consumption

Do you drink coffee on a regular basis?

_____ No

_____ Yes

If yes, then answer:

On average, how many cups (12 ounces) of coffee do you drink per day?

Do you drink tea on a regular basis?

_____ No

_____ Yes

If yes, then answer:

On average, how many cups (12 ounces) of tea do you drink per day?

Do you consume energy drink on a regular basis?

_____ No

_____ Yes

If yes, then answer:

On average, the amount of energy drink consumed per day is:

_____ Drink name

_____ Bottles

Do you consume pops/soda on a regular basis?

_____ No

_____ Yes

If yes, then answer:

On average, the amount of pops/soda consumed per day is:

_____ Drink name

_____ Bottles

2. Prior Knowledge About Caffeine

Coffee is a stimulant. (T)

A cup of brewed coffee typically contains 80 or more mg of caffeine. (F)

A 12-oz can of cola contains 30-65 mg of caffeine. (T)

Caffeine has effect on psychomotor performance. (T)

The effects of caffeine last longer than 5 hours. (T)

As your age, your sensitivity to caffeine declines. (F)

The FDA limits the caffeine content in soft drinks to 71 mg per 12 oz serving. (T)

3. Perceived General Health

Would you say your health in general is?

4. Trait Reactance

I became frustrated when I am unable to make free and independent decisions
I resist the attempts of others to influence me.
It irritates me when someone points out things which are obvious to me.
The thought of being dependent on others aggravates me.
Regulations trigger a sense of resistance in me.
I find contradicting others stimulating.
When something is prohibited, I usually think “that’s exactly what I am going to do.”
It makes me angry when another person is held up as a model for me to follow.
When someone forces me to do something, I feel like doing the opposite.
It disappoints me to see others submitting to society’s standards and rules.
I am content only when I am acting of my own free will.
I consider advice from others to be an intrusion.
Advice and recommendations induce me to do just the opposite.

5. Other-Directed Emotions

After listening to this audio, I feel...
Love
Caring
Empathic
Connected
Sympathy
Grateful

6. Perspectives of Self-Identities

Exposure to the radio:
... made me think of one or more aspects of myself.
... prompted me to identify additional aspects of my identity.
... led me to appreciate I have multiple parts of who I am.
... focused on one or more aspects of my identity.
... led me to identify one or more identities.

7. Argument Strength (Nabi’s Scale)

The article that you just read was:
Unpersuasive/persuasive
Unintelligent/intelligent
Strong/weak
Unconvincing/convincing
Unreasonable/reasonable
Compelling/not compelling

8. Argument Strength (Klein's et al Scale)

There is a strong association between caffeine consumption and the risk mentioned in the article you just read.

Reducing consuming caffeinated beverages is justified on the basis of the article that you just read.

The evidence (mentioned in the article) linking caffeine consumption and potential problems is reliable.

Given the article that you just read, the consumption of caffeine drinks should be reduced.

9. Negative Thoughts

After reading the article, what are your thoughts? You may write down each of your thoughts on one line until you have written down all of your thoughts.

For each of the thought you just wrote, are they favorable, neutral, or unfavorable to the topic/article?

10. Message Manipulation

The article tries to manipulate my feelings.

The article makes me feel manipulated.

The article makes me feel exploited.

11. Message Derogation

The article is exaggerated.

The article is distorted.

The article is overstated.

The article is overblown.

12. Anger

After reading the article, I feel:

Irritated

Angry

Annoyed

Aggravated

13. Fear

After reading the article, I feel:

Afraid

Fearful

Scared

Anxious

14. Attitude

Reducing the consumption of caffeinated beverages is
Bad/good
Wise/unwise
Worthwhile/not worthwhile
Negative/positive
Unfavorable/favorable
Unnecessary/Necessary
Not beneficial/Beneficial

15. Intention

I intend to cut down my everyday caffeine consumption.
I am convinced that I will reduce the amount of caffeine I consume every day.
I am going to reduce my every day caffeine consumption.
I want to decrease my caffeine consumption.
How likely is it that you will intake fewer caffeine beverages every day?

16. Are you _____ male _____ female _____ other (check one)? If you checked "other," please explain.

17. What is your year in school?

_____ Freshman
_____ Sophomore
_____ Junior
_____ Senior
_____ Other (please explain)

18. How would you describe your ethnicity?

_____ African/African American
_____ Asian/Asian American
_____ Caucasian
_____ Hispanic
_____ Native American
_____ Other (please explain)

19. How old are you in years?

Table 1.

Descriptive Statistics, Reliabilities, and Correlations for Study 1

	1	2	3	4
1. Self-affirmation induction				
2. Induction method	.07			
3. Self-affirmation	.48***	-.19**		
4. Self-integrity	-.00	-.03	.10	
<i>M</i>	-	-	4.42	5.71
<i>SD</i>	-	-	1.53	0.79
α	-	-	.95	.78

Note. $N = 274$ (listwise deletion).

*** $p < .001$, ** $p < .01$

Table 2.

Study 1 Outcome Scores Across Conditions

Outcome	Affirmation		Control	
	Value essay (<i>n</i> = 45)	Nostalgic audio (<i>n</i> = 89)	Food list (<i>n</i> = 57)	Car oil audio (<i>n</i> = 83)
Self-affirmation	5.43 (1.32)	5.02 (1.22)	4.30 (1.39)	3.29 (1.29)
Self-integrity	5.74 (0.82)	5.70 (0.80)	5.75 (0.86)	5.69 (0.71)

Note: Standard deviations are labeled in the parentheses.

Table 3.

Study 2 Descriptive Statistics for Argument Strength Across Four Rounds of Pilot Tests

Condition	Argument	Nabi (2002) scale	Klein et al. (2011) scale
Round 1			
Strong (n = 50)	1. Many people might not realize that drinking caffeine beverages could increase the risk of chronological diseases. In a 10-year research project conducted by Dr. Jacob Kelly and his colleagues from John Hopkins University, the researchers find that people who consume high doses of caffeine, for example, coffee drinkers, are more likely to suffer from musculoskeletal fracture (especially among women), heart attack, stroke, and urinary tract cancer.	3.45 (0.78)	3.33 (0.90)
	2*. Taking too much caffeine could also result in short-term health risks. Based on a review of 35 studies with a combined sample of 37,890, a paper published in the British Medical Journal in 2017 reports that excessive caffeine intake results in symptoms similar to taking too much of a stimulant drug, with overdoses causing anxiety/agitation, convulsions, and tremors. People admitted to hospital after taking large amounts of caffeine typically have fast heart beat and high blood pressure. Additionally, a common feature of caffeine overdose is vomiting, which can be very severe. Other gastrointestinal problems such as diarrhea and stomach pains have also been reported.	3.80 (0.84)	3.77 (0.80)

Table 3. (cont'd)			
Condition	Argument	Nabi (2002) scale	Klein et al. (2011) scale
	3*. Caffeine drinks, such as coffee, tea, acidic and sweet energy drinks, or sodas, can stain teeth, erode tooth enamel, and cause tooth decay. Like any drink that isn't water, coffee helps the bacteria in your mouth to create acids that can lead to tooth and enamel erosion. As a result, your teeth become thinner and more brittle and the effect can be cumulative over time. Additionally, even just one cup of coffee or tea a day can begin staining your teeth. As Victoria Veystman, DDS, a professor of Stanford University explains, coffee and tea contains ingredients called tannins. Tannins are a type of polyphenol that break down in water. According to Dr. Veystman, tannins cause color compounds to more readily stick to your teeth. When these compounds stick, they can leave an unwanted yellow hue behind.	3.94 (0.68)	3.77 (0.86)
	4*. Unless you drink your coffee black, caffeinated beverages generally add empty calories to our diets that we don't really need. Sugary beverages are a huge component of the obesity epidemic plaguing the western world. For example, quitting just a habit of one Monster energy drink/day saves 200 calories on a daily basis, 1,400 calories a week, or 73,000 calories a year (which is equivalent to 21 pounds of fat). Quitting just one Starbucks Vanilla Latte/day saves 250 calories per day, 1,750 calories a week, or 91,250 calories a year. A study from the Harvard University found that when caffeine is in a sugary beverage, this substance causes people to consume more of that sugary beverage compared to a sugary beverage without caffeine.	3.99 (0.70)	3.75 (0.87)
Weak (n = 51)	1. Many people might not realize the cost of caffeine drinks can add up and thousands of dollars can be saved if you drink fewer or quit caffeine beverages. Many different forms of products contain caffeine, such as coffee, energy drinks, tea, and some soft drinks. For example, a Grande	3.87 (0.75)	3.59 (0.75)

Table 3. (cont'd)			
Condition	Argument	Nabi (2002) scale	Klein et al. (2011) scale
	Starbucks latte a day can cost you \$3.65, which adds up to \$26 a week and \$1,332 a year. A monster energy drink a day can cost you \$3. By quitting drinking this energy beverage, you can save \$21 a week and \$1,095 a week.		
	2*. Additionally, being addicted to coffee, energy drinks, or soda creates inconvenience in our lives since we need the drug to function. Caffeinated beverages cause us to urinate more often. This can be challenging during meetings, road trips, or when bathrooms aren't convenient. Additionally, by drinking fewer and quitting caffeine beverages, imagine that you never have to stop at Starbucks on the way to work. Imagine that you never have to stop by the convenience store for a red bull. Imagine that you can erase making coffee from your morning routine and save a couple of minutes for sleeping more. Imagine a backpacking trip without packing caffeine pills or the extra weight of coffee making equipment.	3.01 (1.03)	2.92 (0.91)
	3. Quitting caffeine reduces your environmental footprint. Caffeine addiction places a tremendous strain on our natural resources. Think of the number of plastic bottles, cans, and cups that have to be produced in order to meet the demand. Moreover, Americans discard about tons of plastic each year, but only a small amount of them are recycled. The rest ends up in landfills where it may take up to 1,000 years to decompose. Also, because of all the discarded coffee grounds, caffeine has been showing up in municipal water supplies.	3.69 (0.86)	3.48 (0.82)
	4. In most people caffeine is an addictive substance to some degree, although some would describe it as highly addictive. Some people say that once they start to drink caffeine beverage to stay awake, they gradually need to intake more caffeine to achieve the desired results.	3.45 (0.74)	3.46 (0.77)

Table 3. (cont'd)			
Condition	Argument	Nabi (2002) scale	Klein et al. (2011) scale
	Also, if you do not have your daily cup, you will likely develop withdrawal symptoms like extreme fatigue and splitting headaches.		
Round 2			
Weak (n = 60)	1*. Since the discovery of coffee beans in Ethiopia, coffee was a symbol of sin, colonial exploitation, and slavery. In the late 17th Century, caffeine drinks suddenly achieved enormous popularity in Europe, and Europeans started to implement systems of mass production in areas like Haiti. Under French rule, Haiti became particularly affluent from the booming coffee and sugar trade. The heightened demand for these products required additional labor, leading to the importation of African slaves to work on coffee plantations. Today, anyone who consumes caffeinated beverages is inhumane and ignorant of the social history of coffee.	2.54 (0.83)	2.30 (0.85)
	2*. Being addicted to coffee, energy drinks, or soda creates inconvenience in our lives. Caffeinated beverages cause us to urinate more often. This can be challenging during meetings, road trips, or when bathrooms aren't convenient. Additionally, by drinking fewer and quitting caffeine beverages, our lives can be much simpler. Imagine that you never have to stop at Starbucks on the way to work. Imagine that you never have to stop by the convenience store for a red bull. Imagine that you can erase making coffee from your morning routine and save a couple of minutes for sleeping more. Imagine a backpacking trip without packing caffeine pills or the extra weight of coffee making equipment.	3.06 (0.88)	3.02 (0.88)
	3. Quitting caffeine reduces your environmental footprint. Caffeine addiction places a tremendous strain on our natural resources. Think of the number of plastic bottles, cans, and cups that have to be produced in	3.23 (0.91)	3.11 (0.97)

Table 3. (cont'd)			
Condition	Argument	Nabi (2002) scale	Klein et al. (2011) scale
	order to meet the demand. Moreover, Americans discard about tons of plastic each year, but only a small amount of them are recycled. The rest ends up in landfills where it may take thousands of years to decompose. Only reducing the consumption of caffeinated beverages is the best way to remedy this environmental problem. Also, because of all the discarded coffee grounds, caffeine has been showing up in municipal water supplies, causing the tap water to be caffeinated. We can imagine that all animals and plants living on water around the world will be polluted in the near future. In the end, the whole eco-system will be disrupted because of humans' consumption of caffeinated beverages. We can either stop consuming caffeinated drinks or destroy the earth.		
	4. In most people caffeine is an addictive substance to some degree, although some would describe it as highly addictive. Some people say that once they start to drink caffeine beverage to stay awake, they gradually need to intake more caffeine to achieve the desired results. Also, if you do not have your daily cup, you will likely develop withdrawal symptoms like extreme fatigue and splitting headaches. Many people who tried to quit caffeine intake often relapse after several days, resuming or even increasing the consumption of caffeinated drinks.	3.68 (0.72)	3.79 (0.59)
	5. Overconsumption of coffee can influence your athletic performance negatively. Caffeine causes the body to rely more on fat as an energy source during an endurance event like marathons or triathlons. This prevents the body from using up stored glucose (a more accessible energy source) too quickly, which prevents the early onset of fatigue. Additionally, if you drink too much caffeinated beverage, then you will experience gastrointestinal issues and body shaking, which will influence the accuracy of the performance.	3.66 (0.78)	3.59 (0.74)

Table 3. (cont'd)			
Condition	Argument	Nabi (2002) scale	Klein et al. (2011) scale
	6*. The production of caffeinated beverages consumes energies and generates a large amount of carbon emissions. For example, the roasting machines are primarily run off natural gas that is not efficient at all. Also, most cafes run from early in the morning till late in the evening, and thus their immense number of electronics and machines are running all day long. The incredible number of different machines and gizmos that are needed in a café all use an immense amount of energy. The blenders, grinders, brewers, refrigerators, freezers, espresso machines, cash register etc. all of these different appliances are constantly draining energy, and that's not even counting all the electricity being consumed at the front end of the store between all the phones and computers being charged to simply keeping the lights and air conditioning going.	2.98 (0.87)	2.83 (0.85)
Round 3			
Weak (n = 23)	1*. Since the discovery of coffee beans in Ethiopia, coffee was a symbol of sin, colonial exploitation, and slavery. In the late 17th Century, caffeine drinks suddenly achieved enormous popularity in Europe, and Europeans started to implement systems of mass production in areas like Haiti. Under French rule, Haiti became particularly affluent from the booming coffee and sugar trade. The heightened demand for these products required additional labor, leading to the importation of African slaves to work on coffee plantations. Today, anyone who consumes caffeinated beverages is inhumane and ignorant of the social history of coffee.	2.41 (1.25)	2.32 (1.11)
	2*. Being addicted to coffee, energy drinks, or soda creates inconvenience in our lives. Caffeinated beverages cause us to urinate more often. This can be challenging during meetings, road trips, or when bathrooms aren't convenient. Additionally, by drinking fewer and	3.07 (1.01)	3.03 (1.11)

Table 3. (cont'd)			
Condition	Argument	Nabi (2002) scale	Klein et al. (2011) scale
	quitting caffeine beverages, our lives can be much simpler. Imagine that you never have to stop at Starbucks on the way to work. Imagine that you never have to stop by the convenience store for a red bull. Imagine that you can erase making coffee from your morning routine and save a couple of minutes for sleeping more. Imagine a backpacking trip without packing caffeine pills or the extra weight of coffee making equipment.		
	3. Quitting caffeine reduces your environmental footprint. Caffeine addiction places a tremendous strain on our natural resources. Think of the number of plastic bottles, cans, and cups that have to be produced in order to meet the demand. Moreover, Americans discard about tons of plastic each year, but only a small amount of them are recycled. The rest ends up in landfills where it may take thousands of years to decompose. Only reducing the consumption of caffeinated beverages is the best way to remedy this environmental problem. Also, because of all the discarded coffee grounds, caffeine has been showing up in municipal water supplies, causing the tap water to be caffeinated. We can imagine that all animals and plants living on water around the world will be polluted in the near future. In the end, the whole eco-system will be disrupted because of humans' consumption of caffeinated beverages. We can either stop consuming caffeinated drinks or destroy the earth.	3.61 (1.18)	3.38 (1.13)
	4. The price of coffee will go up in the future due to the reduction of bees. Pollinators such as bees play a key part of producing the beans that go into your morning cup of coffee. In fact, bees are responsible for about 20 to 25 percent of coffee production by increasing the plants' yield. However, climate change will move and shrink the land suitable for growing coffee. A bee at the very edge of its heat tolerance won't follow coffee into warmer areas, cutting down the production of coffee. As such, coffee will become scarce, and its price will get more	3.26 (1.04)	2.99 (0.98)

Table 3. (cont'd)			
Condition		Nabi (2002) scale	Klein et al. (2011) scale
expensive. In order to save money in the future, you need to reduce the consumption of coffee and switch to other drinks.			
5*. The production of caffeinated beverages consumes energies and generates a large amount of carbon emissions. For example, the roasting machines are primarily run off natural gas that is not efficient at all. Also, most cafes run from early in the morning till late in the evening, and thus their immense number of electronics and machines are running all day long. The incredible number of different machines and gizmos that are needed in a café all use an immense amount of energy. The blenders, grinders, brewers, refrigerators, freezers, espresso machines, cash register etc. all of these different appliances are constantly draining energy, and that's not even counting all the electricity being consumed at the front end of the store between all the phones and computers being charged to simply keeping the lights and air conditioning going.		2.88 (1.05)	2.78 (1.12)
Round 4			
Strong (n = 25)	See Appendix F	4.07 (0.83)	3.71 (0.89)
Weak (n = 25)	See Appendix F	2.87 (0.84)	2.88 (0.82)

Note: Standard deviations are labeled in parentheses. Mean scores are based on 5-point scales. Arguments labeled with asteroids were used in the main study of study 2.

Table 4.

Descriptive Statistics, Reliabilities, and Correlations Among Major Variables for Study 2

	1	2	3	4	5	6	7	8	9	10	11	12
1. Self-Affirmation Induction												
2. Argument Strength Induction	-.04											
3. Other-Directed Emotion	.56***	-.01										
4. Perspective	.55***	.02	.76***									
5. Anger	-.02	-.18***	.01	.00								
6. Negative Thought	.05	-.32***	-.08	-.08	.29***							
7. Message Manipulation	.05	-.05	.18***	.16**	.48***	.08						
8. Derogation	.01	-.32***	.05	.03	.59***	.47***	.47***					
9. Attitude	-.07	.11*	-.01	-.02	-.29***	-.19***	-.13**	-.27***				
10. Intention	-.08	.19***	.14**	.16**	-.23***	-.45	.01	-.37***	.43***			
11. Trait reactance	-.00	.05	.06	.08	.32***	-.08	.23***	.15**	-.04	.07		
12. Fear	-.04	.23***	.13**	.13**	.30***	-.28***	.30***	.01	.01	.26***	.13**	
<i>M</i>			4.02	4.07	3.04	0.26	3.26	3.90	3.88	3.94	3.91	2.59
<i>SD</i>			1.53	1.47	1.35	0.38	1.38	1.46	0.79	1.64	0.81	1.36
α			.93	.95	-	-	.88	.94	.88	.96	.82	.95

Note. $N = 460$ (listwise deletion).

*** $p < .001$, ** $p < .01$, and * $p < .05$.

Table 5.

Study 2 Outcome Scores Across Conditions

	Affirmation		Control	
	Strong (<i>n</i> = 111)	Weak (<i>n</i> = 117)	Strong (<i>n</i> = 123)	Weak (<i>n</i> = 110)
Perspective	4.90 (1.04)	4.81 (1.27)	3.34 (1.32)	3.18 (1.29)
Other-directed emotions	4.92 (1.18)	4.86 (1.25)	3.18 (1.32)	3.16 (1.38)
Negative thoughts	0.16 (0.31)	0.38 (0.42)	0.12 (0.26)	0.38 (0.44)
Anger	2.84 (1.18)	3.17 (1.40)	2.77 (1.26)	3.42 (1.45)
Derogation	3.49 (1.23)	4.32 (1.40)	3.38 (1.25)	4.44 (1.61)
Message manipulation	3.28 (1.29)	3.39 (1.51)	3.11 (1.23)	3.28 (1.48)
Attitude	3.91 (0.83)	3.73 (0.74)	4.00 (0.78)	3.85 (0.79)
Intention	4.07 (1.48)	3.60 (1.60)	4.38 (1.58)	3.69 (1.75)

Note: *N* = 460 (listwise deletion). Standard deviations are labeled in parentheses. Negative thought scores ranged from 0 to 1. Attitude and anger was assessed on 5-point scales. All other variables were measured on 7-point scales.

Table 6.

Coefficients for Path Models Under the Strong and Weak Message Conditions

Hypothesized path	Coefficient	
	Strong (<i>n</i> = 233)	Weak (<i>n</i> = 227)
Self-affirmation → Other-directed emotions	.58***	.55***
Self-affirmation → Perspective	.55***	.55***
Other-directed emotions → Anger	.06	-.10
Other-directed emotions → Derogation	.07	.02
Other-directed emotions → Negative thoughts	.01	-.10
Other-directed emotions → Message manipulation	.07	.16*
Perspective → Anger	-.03	-.05
Perspective → Derogation	.04	-.05
Perspective → Negative thoughts	-.04	-.00
Perspective → Message manipulation	.13*	-.06
Anger → Attitude	-.27***	-.14*
Derogation → Attitude	-.18**	-.10
Negative Thoughts → Attitude	-.11	-.08
Message Manipulation → Attitude	.08	.01
Attitude → Intention	.45***	.40***
Path Predicted by Covariate		
Reactance Trait → Anger	.35***	.26***
Reactance Trait → Derogation	.24***	.13
Reactance Trait → Message Manipulation	.28***	.12
Fear → Anger	.38***	.27***
Fear → Negative Thoughts	-.10	-.31***
Fear → Message Manipulation	.22***	.33***
Fear → Intention	.17**	.29***
Recruitment Source → Intention	.09	.04

*** $p < .001$, ** $p < .01$, and * $p < .05$.

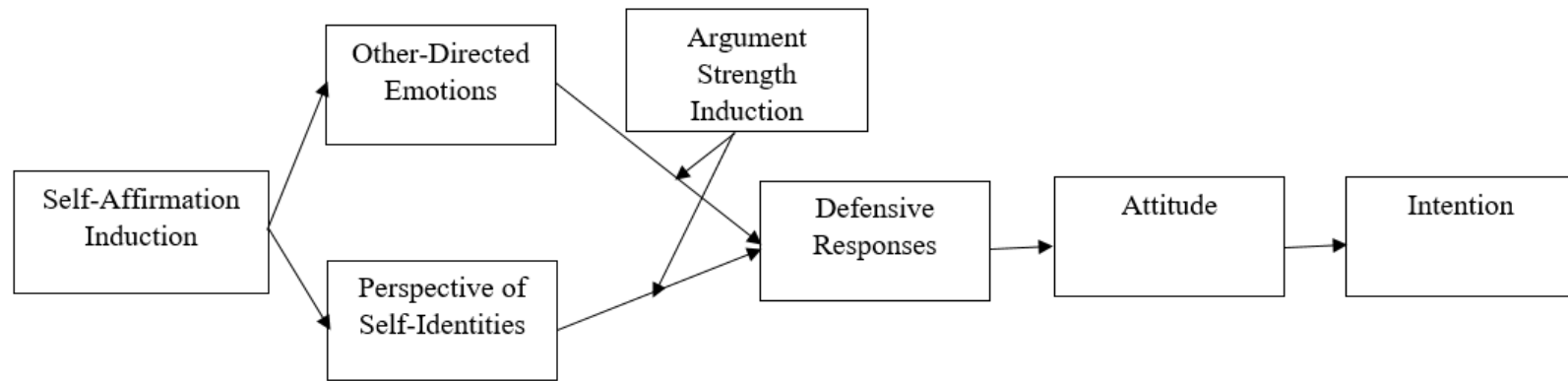


Figure 1. Hypothesized Path Model

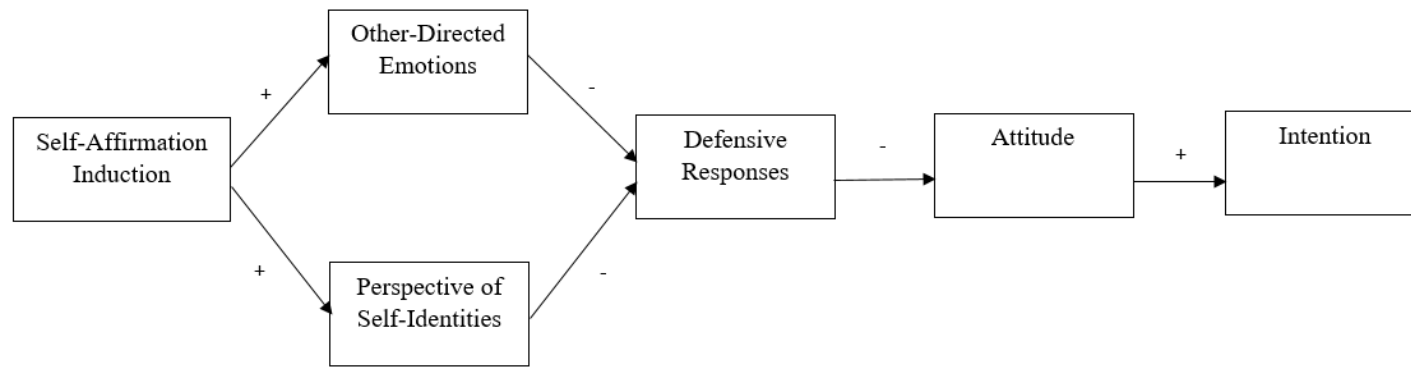


Figure 2. Hypothesized Path Model Under the Strong Message Condition

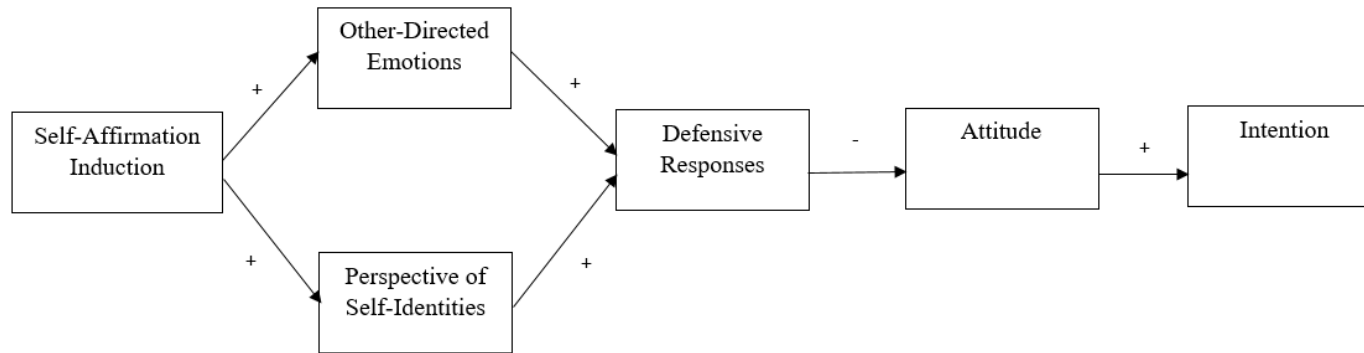


Figure 3. Hypothesized Path Model Under the Weak Message Condition

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