THESIS

THE EFFECT OF PSYCHOLOGICAL DISTANCE ON E-SMOKING CESSATION

CAMPAIGN MESSAGES

Submitted by

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ABSTRACT

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CAMPAIGN MESSAGES

The study examines the effect of psychological distance on psychological reactance toward e-smoking cessation campaigns, attitude for the e-smoking cessation campaign message, and intention to quit e-smoking as a response to campaign messages as well as the potentially moderating effect of preexisting message fatigue between message types based on psychological distance and psychological reactance. To test effects of psychological distance, 360 participants were randomly assigned to one of four conditions: 1) near social distance and high hypothetical distance, 2) distant social distance and high hypothetical distance, 3) low social distance and high hypothetical distance, and 4) low social distance and low hypothetical distance. The current study found that people exposed to the near social frame showed a higher level of psychological reactance. Moreover, people experiencing higher message fatigue showed a higher level of psychological reactance, which led to a decreased attitude for the e-smoking cessation campaign message and a decreased intention to quit e-smoking. This study will ultimately inform how researchers should consider the importance of adverse effects for improving the effectiveness of campaigns. Furthermore, the finding from the current study would not only extend earlier studies on psychological reactance, message fatigue, and psychological distance based on Construal level theory (CLT), but also provide practical suggestions to campaigners and practitioners.

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CHAPTER 1. INTRODUCTION

Tobacco smoking causes the death of millions of people every year, and is regarded as one of the most important public health issues in the world (World Health Organization (WHO), 2017). Smoking is also associated with lethal diseases, including multiple forms of cancers, heart-related diseases, and stroke (U.S. Department of Health and Human Services, 2014). To deal with the problems related to tobacco smoking, educators and health organizations have developed both psychosocial and pharmacological interventions.

E-cigarettes are one method offered to help smokers quit smoking (El Dib et al., 2017). E-cigarettes are electronic devices originally developed as an alternative nicotine delivery device to help people quit smoking, together with nicotine gum, patches, and other products (Grana, Benowitz, & Glantz, 2014). However, they enable smokers to consume nicotine, which is the addictive substance in traditional cigarettes; e-cigarettes may therefore be as problematic as smoking traditional cigarettes.

Usage of e-cigarettes, unlike other smoking-cessation products, has increased far more rapidly than other cessation products. For example, youths showed an increased use of e-cigarettes from 0.6% in 2011 to 10.5% in 2019 (e.g., middle school students) and from 11% in 2017 to 27.5% in 2019 (e.g., high school students). Young adults aged 18-24 showed an increased use of e-cigarettes from 2.4% in 2012 and 2013 to 7.6% in 2018. Adults aged 25-44 also showed an increased use of e-cigarettes from 2.4% in 2012 and 2013 to 4.2% in 2018 (Truth initiative, 2019).

Literature on e-cigarettes shows that e-smoking is identified as a social problem in its own right (Grana et al., 2014; Kwon et al., 2018). As a result, scholars and health professionals have called for intervention campaigns to communicate the dangers of e-cigarettes and of nicotine. A study by El Dib et al. (2017) notes that e-cigarettes may not actually help traditional smokers quit, but instead might serve as a bridge to using traditional cigarettes. This research highlights why interventions to decrease e-smoking are of importance. Based on the previous studies, the intervention of e-smoking cannot be underestimated to reduce the e-smoking rate. Hence, the current study is to emphasize the danger of e-smoking itself and the its intervention as well as to examine how to make effective e-smoking cessation campaign to reduce e-smoking rate efficiently.

Fortunately, anti-smoking campaigns have been quite successful in decreasing cigarette smoking rates over the past decades. In turn, health officials continue to seek techniques to improve campaign effectiveness. However, with the success of anti-smoking campaigns, campaigners working for e-smoking cessation campaigns simultaneously need to consider several adverse features caused by the campaigns. Before commencing with an examination of how to develop successful e-smoking cessation campaigns, it is necessary to understand why some smokers continue smoking. According to Pechmann and Knight (2002), smokers are not unaware of the risks. They already perceive smoking as a behavior that is dangerous to their health. However, this research has found that many smokers regard messages in anti-smoking campaigns as a threat to their freedom and experience a psychological reaction when the campaign attempts to restrict their behavior (Erceg-Hurn, & Steed, 2011; Shoham et al., 2004; Waters et al., 2016). According to the theory of psychological reactance (Brehm, 1966), this may be because such messages elicit negative psychological reactions when freedom of behavior

appears restricted or threatened. As a result, people reject threatening messages in order to restore their sense of freedom or to continue to oppose restricted action (Miron & Brehm, 2006; Rosenberg & Siegel, 2018).

E-smokers are likely to show the same response to e-smoking cessation campaigns because the core message is similarly focused on restricting behavior. Such campaigns may generate negative psychological responses, such as psychological reactance as unintended effects. According to Rosenberg & Siegel (2018), message types can be used to manipulate the level of psychological reactance. Moreover, psychological distance can be projected into the message types as distance-based framing (Nan et al., 2015). Considering the importance of message types, the current study suggests that campaign creators should examine the role of psychological reactance and the use of message types to manipulate psychological reactance, which can improve the effectiveness of e-smoking cessation campaigns.

Another emphasis of this study is to examine the effects of excessive exposure to smoking cessation messages. So and colleagues (2017) indicate that anti-smoking campaigns over a prolonged period elicit message fatigue, which reduces the effectiveness of these messages. Many e-smokers have already been exposed to anti-smoking campaigns over a prolong period, from which they elicit their own pre-thoughts on smoking cessation-related messages. This also presents a challenge for e-smoking cessation campaigns. Practitioners should consider negative reactions to e-smoking campaigns through both psychological reactance and preexisting message fatigue from anti-smoking campaigns to improve the effectiveness of their campaigns.

The aim of the current study is to investigate the impact of message types on reducing psychological reactance toward e-smoking cessation campaigns. The study examines the effect

of psychological distance on intention to quit e-smoking as a response to campaign messages as well as the potentially moderating effect of preexisting message fatigue.

This study will ultimately inform how researchers should consider the importance of adverse effects for improving the effectiveness of campaigns. The finding from the current study will not only extend earlier studies on psychological reactance, message fatigue, and psychological distance based on Construal level theory (CLT), but also provide practical suggestions to campaigners and practitioners.

CHAPTER 2. LITERATURE REVIEW

2.1. Background of Smoking Cessation Campaigns

The purpose of promotional health messages for public health, especially anti-smoking campaigns is to help smokers quit smoking. However, this is a difficult goal to achieve (Ringold, 2002). Various organizations and researchers have considered anti-smoking campaigns since the advent of the Surgeon General's Report on smoking and health provided by CDC in 1964 (U.S. Department of Health and Human Services, 2000; Warner, 1977). The Federal Communications Commission (FCC) introduced regulations in 1967, such that broadcasters should provide important air time for anti-smoking campaigns (Siegel, 1998; U.S. Department of Health and Human Services, 2000).

In the academic field, various researchers concentrated on developing effective strategies and messages to reduce smoking behavior. Kim and Park's (2002) study attempted to study together the three variables of message framing, message appeal levels, and smoking status to examine what strategy worked best to persuade the audience. The results showed that using negative messages with higher intensity appeal resulted in a higher persuasive effect of anti-smoking campaigns on non-smokers. However, other studies suggest that positive messages have a stronger effect on intention to quit smoking (Arendt et al, 2018; Wong and McMurray 2002). Overall, researchers examining message framing have found contradictory results on the persuasive effects of anti-smoking campaigns depending on their research directions. This is because those researchers did not take into account the unintended effects of message types on persuasive effects. Hence, psychological reactance can explain why smokers exhibit negative

reactions towards certain anti-smoking campaigns. The message type can have an impact on psychological reactance, which in turn can affect the persuasive effect of the message.

Quitting smoking is extremely difficult for smokers due to the complexity of nicotine addiction (Fagerstrom et al., 1992; Tutka et al., 2019). Nicotine is well known to be not only addictive, but to also cause serious systemic side effects, such as cancer (Mishra et al., 2015). However, smokers, especially young smokers, overestimate their ability to resist nicotine addiction with unrealistic optimism (Waters et al., 2016).

Smoking cessation campaigns for both e-smoking and cigarette smoking have the same purpose: quitting smoking. Kwon and colleagues (2018) point out that e-smoking interventions are important because e-cigarettes are as harmful as cigarettes. In other words, nicotine, which is present in both cigarettes and e-cigarettes, is highly addictive and can impede brain development. Klein (2018) found that e-smoking enabled e-smokers to be addicted to nicotine, which gave rise to combustible smoking as well. This suggests a similarity between the two smoking behaviors, which is likely to lead to nicotine addiction, strengthening the link between the two behaviors.

When studying anti-smoking campaigns, regardless of the types of smoking, such as e-smoking and combustible smoking, it is necessary to first separate smokers from non-smokers due to nicotine addiction. Nicotine addiction makes it more difficult to quit smoking. In other words, smokers with nicotine addiction face a psychological non-match status between their own behavior and the message provided in a smoking cessation campaign by smoking behavior. Non-smokers, on the other hand, do not have nicotine addiction, which means there is a match between their current non-smoking behavior and the message, thus avoiding an unbalancing psychological status. Haftad and Aaro (1997) also suggested it is more effective to persuade non-smokers to maintain their attitudes towards smoking than to change smokers' attitude through

anti-smoking campaigns. Nan et al. (2015) tested the effect of message frames, such as gain vs. loss and present-oriented vs. future-oriented frame, among non-smokers in their cigarette warning label study. They found no significant message framing effect in the study and assumed that the reason for the result might be lack of personal relevance among non-smokers. They believed that non-smokers did not react differently to the messages presented to them as they did not find it personally relevant. However, smokers might focus more on the message content because of the direct connection these messages have with their smoking behavior. Dillard and Shen (2005) pointed out the difficulty in designing campaigns that do not arouse reactance among targeted groups. They suggest that smokers are more likely to display reactance towards anti-smoking campaigns. Using well-constructed and tailored messages are important to reduce smokers' reactance towards anti-smoking messages. Consequently, this study focuses on smokers who are affected by nicotine addiction, examining their psychological defense mechanisms.

2.2 Psychological Reactance

According to the theory of psychological reactance, Brehm (1966) pointed out that when people feel that their free will is violated, they activate psychological reaction to protect it. When they feel that there is threat to their freedoms, they may express a negative reaction to the threat—and even behaviors that oppose the messages' recommendation—until they feel that their freedom has been restored (Brehm & Brehm, 2013; Miron & Brehm, 2006; Rains & Turner, 2007; Steindl et al., 2015). In public health campaigns, especially anti-smoking campaigns, the effectiveness of the health message can be reduced or rejected through psychological reactance (Burgoon et al., 2002).

Since the theory of psychological reactance was introduced, many researchers have conducted various studies to develop this theory. Early research in the area of psychological reactance focused on situational determinants of reactance where they examined the relationship between the importance of freedoms and the level of psychological reactance (Mazis et al., 1973; Pennebaker & Sanders, 1976; Wortman & Brehm, 1975). However, these situational determinants could not fully explain the variability between individuals regarding the degree of reactance they displaced. The more that people are involved in certain behaviors, the more reactance they demonstrate. This is a main reason why smokers with nicotine addiction show more reactance towards anti-smoking campaign messages compared to non-smokers (Linder & Worchel, 1970).

The revised version of Brehm and Brehm's theory (1981) of psychological reactance started to consider individual differences as key variables, which admitted that people perceive psychological reactance differently, because the results of studies that focus on situational determinants were inconsistent (Miron & Brehm, 2006). When people are denied their specific behaviors, there is a great feeling of reactance in certain situations, while those who are not interested in the situation do not necessarily feel reactance to the same extent (Youn, 2016).

In recent years, the concept of psychological reactance has been widely utilized in communication fields (Steindl et al., 2015). According to Rosenberg and Siegel (2018), many communication scholars utilized the concept of message in research that influenced psychological reactance, such as controlling language (e.g., Grandpre et al., 2003), autonomy-supportive language (e.g., Miller et al., 2007), gain and loss framing (e.g., Cho & Sands, 2011). That is, different message types can affect psychological reactance, which ultimately affects behavioral intention (Miron and Brehm, 2006).

More recently, studies have not only focused on the type of message (e.g., Shen, 2015; Wong et al., 2015), but also on pre-existing message fatigue (e.g., Kim & So, 2018; So et al., 2017) as key variables that influences psychological reactance.

2.3 Psychological Distance in Construal Level Theory (CLT)

Construal level theory (CLT) inquiries into the abstractness of individuals' mental processes depending on psychological distance (Fiedler, 2007; Park & Park, 2016). In other words, people view an event differently depending on temporal, social, spatial, and hypothetical differences. Trope and Liberman (2010) suggested that high-level construals are regarded as relatively abstract, coherent, and superordinate mental processes compared to low-level construals. That is, people perceive an event with a high level of psychological distance as being more abstract using a higher-level construal process, whereas an event with a low level of psychological distance is considered more concrete, using a lower-level construal process (Trope & Liberman, 2010).

Psychological distance is regarded as a significant factor in how people activate their interpretations differently (Trope & Liberman, 2010). The concept of temporal distance refers to the factor that influences people's decisions based on event time (Liberman & Trope, 1998). Before developing the concept of extended psychological distance in CLT, temporal distance was considered to be the only dimension of psychological distance (Liberman &Trope, 1998; Nan, 2007). In follow-up studies (e.g., Trope & Liberman, 2003; Trope & Liberman, 2010; Trope et al., 2007) psychological distance was extended by including the concepts of spatial distance, social distance, and hypothetical distance, as the concept of temporal, spatial, social, and hypothetical distance also referred to factors influencing people's decisions based on

location, relationship, and possibility (Trope & Liberman, 2010). All four types of psychological distance have been found to influence behavioral effects (Fiedler et al., 2012).

Based on CLT, events with greater psychological distance are perceived as less attractive (Park & Park, 2016; Trope & Liberman, 2010). This is because the level of value of events decreases in high distance situations, which explains the lack of positive responses toward "distant" campaigns (Park & Park, 2016, p. 79). In other words, people did not regard an event with great psychological distance as being important, but instead thought it irrelevant, which would reduce its effectiveness, and render it meaninglessness when exposed to it continuously.

2.4 Psychological Distance and Psychological Reactance

Temporal distance has been studied in anti-smoking campaigns to examine how temporal distance influences the persuasive powers of campaigns (Chandran & Menon, 2004; Kim & Kim, 2018; Nan et al., 2015; Zhao et al., 2015). This is because the psychological effects of temporal distance could be translated to message types. That is, incorporating temporal distance into a campaign message can influence message perception and persuasiveness (Chandran and Menon, 2004; Nan et al., 2015).

For example, Chandran and Menon, (2004) examined the role of temporal framing in a health-related campaign and found that a present-oriented message had a greater influence on risk perceptions and behavioral intention than a future-oriented message. Similarly, Kim and Kim (2018) examined smokers exposed to the near temporal frame message, who showed greater personal relevance, perceived susceptibility to the health risk provided in the message, and increased intention to quit smoking than those who were exposed to the distant temporal frame message.

Social distance affects the process by which people internally interpret the information or event differently from temporal distance (Nan, 2007), which influences their evaluation and preferences of objects (Trope & Liberman, 2010). In other words, people make their own judgments differently depending on the difference of the social distance (Nan, 2007). Similarly, Ebert (2005) suggested that near social distance using low-level construal (e.g., self) tended to be more important than judgements using distant social distance using high-level construal (e.g., a friend) based on the concept of CLT.

Thus, many researchers have mentioned the importance of studying social distance as temporal distance because it gives rise to distinct psychological interpretations of the same event, differently (Chandran & Menon, 2004; Nan, 2007; Trope & Liberman, 2010). In e-smoking cessation campaigns, campaigners can comprise campaign messages differently; some messages are concentrated on smokers' direct health issues; however, others are concentrated on second-hand smokers' indirect health issues. Based on social distance in CLT, different interpretations should be elicited, depending on how the focus on messages in terms of social distance (for example, selves vs. others).

As previous studies mentioned, message frames affect the level of psychological reactance. Moreover, psychological distance can be translated to message frames. In turn, psychological distance within message frames is likely to affect the level of psychological reactance.

By considering the importance of empirical study on social distance, the present study assumes that the role of social distance might influence psychological reactance, which is negatively related to a persuasive power based on previous studies. Thus, near social distance framing will demonstrate low psychological reactance in e-smoking cessation campaigns. The

current study, therefore, examines the relationship between social distance and psychological reactance for e-smoking cessation campaigns by setting the following hypothesis in a practical setting.

H1: A near social frame will lead to decreased psychological reactance for e-smoking cessation campaigns compared to a distant social frame.

Hypothetical distance, like temporal and social distance, affects the process by which people internally interpret (Liberman & Trope, 2014). According to Trope and Liberman (2010), individuals react more strongly to events with a higher probability. In the same vein, Liberman and Trope (2014) mention that the difference between high probability and low probability indicates different reactions to events. People utilize a high level of construal process when they perceived the probability is low, while others utilize a low level of construal process when they perceived the probability is high (Trope and Liberman, 2010).

In the present study, considering the fact that the social distance could be translated to social frames, hypothetical distance can also be translated to hypothetical frames, influencing psychological reactance. In this study, we predict that the role of hypothetical distance might influence psychological reactance, which is negatively related to a persuasive power based on previous studies.

Thus, a high hypothetical frame will cause lower psychological reactance to e-smoking cessation campaigns. Therefore, the current study examines the relationship between social distance and psychological reactance for e-smoking cessation campaigns by setting the following hypothesis in a practical setting.

H2: A high hypothetical frame will lead to decreased psychological reactance for e-smoking cessation campaigns compared to a low hypothetical frame.

According to CLT, each perceived distance affects other perceived distances on other subdimensions (Trope, Liberman, 2010). Similarly, Chandran and Menon (2004) suggest the significance of interaction between different dimensions of psychological distance, finding a moderation effect between temporal and social distance for self-risk perception. Moreover, Park and Park (2016) found interaction effects between temporal and spatial distance on their CSR campaigns study, as did Han and Gershoff (2018), who also found interaction effects between temporal and spatial distance in their study.

This study predicts that the interaction effect between two dimensions of psychological distance also has the same stream relationship like each psychological distance. Considering both relationships between distance and persuasive powers, and between psychological reactance and persuasive powers, the combination between near social frame and high hypothetical frame will show low psychological reactance for e-smoking cessation campaigns. Therefore, the current study examines the relationship by setting the following hypotheses in a practical setting:

H3: There will be an interaction effect of social frames (near vs. distant) and hypothetical frames (high vs. low) on psychological reactance for e-smoking cessation campaigns such that:

H3-1: within a near social frame, a high hypothetical frame will lead to the greatest decrease of psychological reactance for e-smoking cessation campaigns, and

H3-2: within a distant social frame, a low hypothetical frame will lead to the greatest increase of psychological reactance for e-smoking cessation campaigns.

RQ1: How would participants exposed to a message that uses a near social frame and low hypothetical frame experience psychological reactance, compared to participants exposed to a message that uses a distant social frame and high hypothetical frame?

2.5 Psychological Distance, Message Fatigue, and Psychological Reactance

Many previous studies have consistently confirmed that message type is a key variable that influences psychological reactance. However, results from previous studies were inconsistent, as people do not always show constant reactance to the message. Individual differences influence the level of psychological reactance based on a revised theory of psychological reactance as an internal factor (Brehm & Brehm, 1981; Miller et al., 2007; Miron & Brehm, 2006). In other words, depending on intrinsic motivation, thoughts, and connection with events or situations, smokers elicit a different level of psychological reactance (Miron & Brehm, 2006).

Message fatigue for e-smoking cessation campaigns plays a significant role in hampering the effects of campaigns, because anti-smoking campaigns have been delivered over a long time. However, few researchers have studied message fatigue in health message domains (e.g., anti-smoking campaigns) due to the ambiguous definition of message fatigue. So et al. (2017, p.10) defined message fatigue as one of the unintentional effects of an aversive motivational state of exhaustion and boredom beyond the reference point.

A conceptual definition of message fatigue includes four sub-dimensions: perceived overexposure, perceived redundancy, exhaustion, and tedium. First, perceived overexposure is defined as the audiences' subjective perception that media exposure to a series of similar messages exceeds the desired level. Second, perceived redundancy refers to audiences' subjective perception that a series of related messages are similar enough that they are repeatedly recognized as duplicates. Third, exhaustion is defined as a combination status of feeling both mentally burned-out and worn-out due to message repetition. Lastly, tedium refers to a lack of interest or enthusiasm status for messages available on a given topic (Kim & So, 2018, p. 109).

So and Popova (2018) examined how individuals showed different message fatigue for anti-tobacco messages based on individual differences. In addition, So et al. (2017) found that message fatigue was positively related to counterargument, which is regarded as a sub-dimension of psychological reactance in their study. Similarly, Kim and So (2018) empirically examined the positive relationship between message fatigue and psychological reactance in health campaigns.

Based on internal factors influencing psychological reactance, the current study predicts a moderating effect of pre-existing message fatigue between message types based on psychological distance and psychological reactance. Individuals were already exposed to anti-smoking campaigns with the same purpose as e-smoking cessation campaigns over several decades, which is likely to cause pre-existing message fatigue for anti-smoking campaigns before viewing e-smoking cessation campaigns. In other words, smokers will have pre-existing message fatigue, but the degree of message fatigue is not the same, which is regarded as an individual difference as an internal factor influencing psychological reactance. Therefore, the current study examines this relationship by setting the following hypotheses in a practical setting.

H4: Low message fatigue will lead to decreased psychological reactance for e-smoking cessation campaigns compared to high message fatigue.

RQ2: How do the other combinations between a social frame, a hypothetical frame, and message fatigue impact on level of psychological reactance?

2.6 Psychological Reactance, Attitude, and Intention

As noted earlier, psychological reactance is the negative response to restore threatened freedom caused by the antecedents of reactance. In other words, psychological reactance gives rise to negative attitude and reduced behavioral intention toward the persuasive message (Steindl

et al., 2015). Dillard and Shen (2005) conducted empirical study on the negative relationship between psychological reactance and attitude toward message advocacy for health-related messages, and found a mediated effect of attitude between psychological reactance and behavioral intention. Many follow-up studies also found a negative relationship between the two variables and the mediated effect of attitude (e.g., Quick et al., 2011; Rains, 2013; Rains & Turner, 2007).

The current study predicts that the arousal of psychological reactance will lead to a negative attitude toward the e-smoking cessation campaign based on previous studies. Therefore, the current study examines the negative relationship by setting the following hypothesis in a practical setting.

H5: Lower psychological reactance toward the e-smoking cessation campaign will lead to increased positive attitude for the e-smoking cessation campaign message.

Miller et al. (2007) indicated that health campaign messages have good intentions for the recommended actions, but the attitude of health campaigns are decreased by psychological reactance. In other words, if people perceive that their freedom of action is being oppressed, they show anger and a negative attitude, which leads to psychological reactance. Eventually, this also adversely influences attitude and further behavioral intention. However, some research ignores the mediated effect between psychological reactance and behavioral intention. For example, Turner and Underhill (2012) found that anger about the message, which is a factor in the evaluation of psychological reactance, was negatively correlated with behavioral intention. Similarly, Kim and So (2018) found psychological reactance was negatively corelated with behavioral intention in health campaigns. Specifically, they divided psychological reactance into two dimensions negatively corelated with behavioral intention: anger and counterargument.

Both studies examined the direct path between psychological reactance and behavioral intention. This is because attitude-intention correspondence is not always strong for types of health-related contexts. For example, in the research by Dillard and Shen (2005), they used two different health-related contexts: 1) the flossing context, and 2) the alcohol context. The result of the positive relationship between attitude and behavioral intention was only shown in the flossing context. In the alcohol context, the arousal of psychological reactance led directly to behavioral intention without the relationship between attitude and behavioral intention. However, many studies in smoking-related contexts have continued to utilize the causal link between attitude and behavioral intention confirmed by the theories of reasoned action and planned behavior (e.g., Namkoong et al., 2017; Phua et al., 2018).

As former studies have examined, attitude leads to behavioral intention in the e-smoking cessation campaign, there is a relationship between psychological reactance and intention to quit e-smoking, and attitude mediate psychological reactance and behavioral intention. Therefore, the current study assumes that a positive attitude toward the e-smoking cessation message will lead to a higher intention to quit e-smoking, there will be a negative relationship between psychological reactance and intention to quit e-smoking, and attitude toward the campaign message will mediate psychological reactance toward the e-smoking cessation campaign and intention to quit e-smoking. Thus, this study sets the following hypotheses to identify the relationship between psychological reactance and the intention to quit e-smoking:

H6: positive attitude toward the e-smoking cessation message in the campaign will lead to increased intention to quit e-smoking.

H7: Decreased psychological reactance will lead to increased intention to quit e-smoking.

H8: Attitude toward the e-smoking cessation campaign message will significantly mediate the relationship between psychological reactance and intention to quit e-smoking.

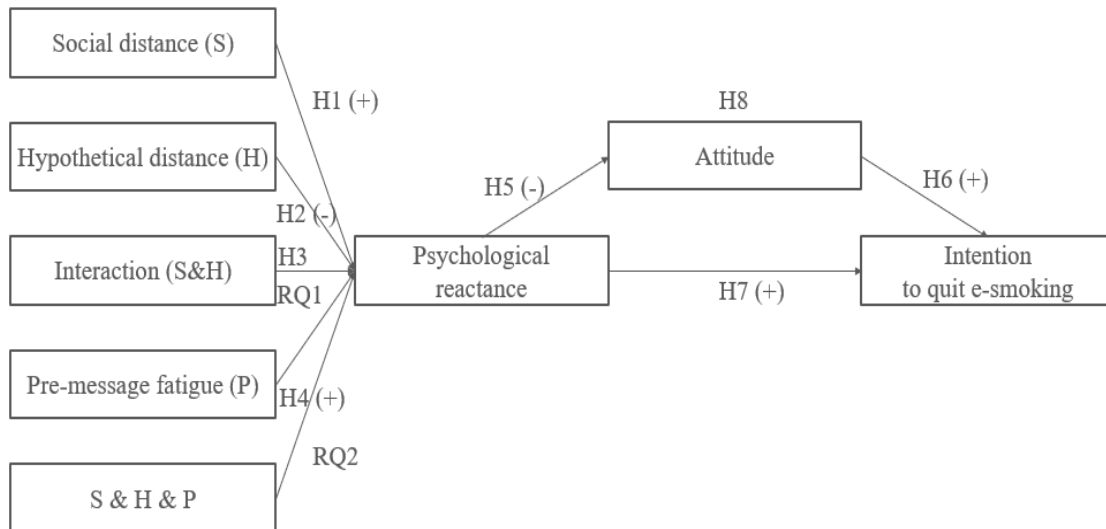The theoretical framework of this study is provided in figure 1.

Figure 1. The Theoretical Framework

CHAPTER 3. METHODS

3.1 Participants

This experimental study was conducted online. The recruitment of the 419 study participants was completed using Amazon Mechanical Turk (MTurk). Participants were residents of the United States who were over the age of 18; participation was limited to e-smokers. Participants received a monetary reward ($0.5) for their participation. Fifty-nine participants were excluded from the sample because they were not able to pass the test to screen out random clicking. In all, 360 individuals —222 males (61.7%) with mean age = 37.21, 137 females (38.1%) with mean age = 36.19, and 1 other (.3%) (i.e., non-disclosed) with mean age = 35—participated The majority was White (72.5%, N = 261), followed by Black (14.2%, N =51), Asian (10%, N = 36), others (e.g., mixed; 1.9%, N = 7), American Indian or Alaska Native (.8%, N = 3), and Native Hawaiian or Pacific Islander (.6%, N = 2) (see Table 1).

3.2 Design and Procedure

The study consisted of a 2 (social frame: me/others) x 2 (hypothetical frame: high/low) factorial design to examine the effects of psychological distance within message frames on psychological reactance toward e-smoking cessation campaigns, the effects of psychological reactance on the attitude toward the campaign message, and the intention to quit e-smoking. First, participants' pre-existing fatigue toward anti-smoking campaigns was measured. Next, participants were randomly assigned to one of four conditions (near social distance and high hypothetical distance; distant social distance and high hypothetical distance; low social distance and high hypothetical distance; or low social distance and low hypothetical distance). They were

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then exposed to an e-smoking cessation campaign poster for more than 10 seconds. After seeing the poster, they were asked to answer questions measuring psychological reactance, attitude toward e-smoking cessation message, and their intention to quit e-smoking. Finally, participants' demographic information was collected.

3.3 Stimulus Materials

To remove confounding factors, the current study used a fictitious disease instead of existing diseases because people have already formed opinions regarding existing diseases based on background knowledge from many information sources, such as CDC reports, hearsay, and anti-smoking campaigns. This study used "thorny nausea disease," provided by the disease name generator website, as an e-smoking-related disease. This study defined thorny nausea disease as a fatal condition that would lead to sudden death as a result of changing or damaging blood chemistry, which was presented in the poster. The words "you" and "e-smoking" were used in the campaign posters to manipulate the near social frame conditions, whereas the words "others around you" and "second-hand e-smoking" were used in the distant social frame conditions. The high hypothetical frame (i.e., the high possibility of benefitting from quitting e-smoking) was emphasized by including a message that quitting e-smoking would decrease the chances of contracting thorny nausea disease by 58%. Conversely, the low hypothetical frame message (i.e., the low possibility of benefitting from quitting e-smoking) was operationalized by including a message that quitting e-smoking would decrease the chances of contracting thorny nausea disease by 2%. All of the emphasized words were bolded and in a bigger size than regular words to ensure that participants focused more on the framed words. Each condition included the same words and the same visualization, excluding the emphasized words (see Appendix A).

3.4 Measures

3.4.1 *Psychological reactance*

Four items for measuring anger were adopted from Dillard and Shen (2005), and four items for measuring counterargument were adopted from Kim and So (2018). These eight items were used as a measure for psychological reactance. Items included: "I felt angry when I viewed the e-smoking cessation campaign messages" (anger) and "I found myself thinking of ways I disagreed with what was being presented" (counterargument). All questions were measured using a 7-point Likert scale ranging from "strongly disagree" to "strongly agree." Scale reliability was assessed using Cronbach's alpha (M = 3.7, SD = 1.63, and α = .94).

3.4.2 *Message fatigue on anti-smoking campaigns*

Participants' message fatigue for anti-smoking campaigns was measured using 17 items from the Message Fatigue Scale developed by So et al. (2017). Message fatigue has four sub-dimensions: perceived overexposure, redundancy, exhaustion, and tedium. Items included in this scale are: "I have heard enough about how important it is to stay away from cigarette" (overexposure); "After hearing smoking cessation campaigns for years, messages on anti-smoking seem repetitive" (redundancy); "I am burned out from hearing that cigarette smoking is a serious problem" (exhaustion); and "Health messages on anti-smoking are boring" (tedium). All questions were measured using a 7-point Likert scale ranging from "strongly disagree" to "strongly agree." Scale reliability was assessed using Cronbach's alpha (M = 4.63, SD = 1.24, and α = .94).

3.4.3 *Attitude toward the e-smoking cessation campaign message*

Three items on the semantic differential scale adopted from MacKenzie and Lutz (1989) were used to measure attitudes regarding the e-smoking cessation campaign message. Items

included bad–good, unfavorable–favorable, and negative–positive. Scale reliability was assessed using Cronbach's alpha (M = 4.83, SD = 1.67, and α = .94).

3.4.4 *Intention to quit e-smoking*

Three items developed by Madden et al. (1992) were used to measure participants' intentions to quit e-smoking. These items were slightly modified for the purpose of the e-smoking cessation campaign topic. The three items were: "I intend to quit e-smoking," "I will make an effort to quit e-smoking," and "I will try to quit e-smoking." All items were measured using a 7-point Likert scale ranging from "strongly disagree" to "strongly agree." Scale reliability was assessed using Cronbach's alpha (M = 4.95, SD = 1.67, and α = .94).

3.4.5 *Demographic information*

Participants were asked questions regarding their gender, age, ethnicity, and income as well as e-smoking frequency.

Table 1. Demographic Information

Variable	Category	N	%	Variable	Category	N	%
Gender	Male	222	61.7	Ethnic	White	261	72.5
	Female	137	38.1		Black	51	14.2
	Others	1	.3		American Indian or	3	.8
Total		360	100		Alaska Native		
Age	18-19	2	.6		Asian	36	10.0
	20-29	115	31.9		Native Hawaiian or	2	.6
	30-39	128	35.6		Pacific Islander		
	40-49	60	16.7		Others	7	1.9
	50-59	32	8.9	Total		360	100
	60-69	18	5.0	Income	≤ 9.999	12	3.3
	70-79	5	1.4		$10.000-19.999	18	5.0
Total		360	100		$20.000-29.999	46	12.8
Education	< High school	1	.3		$10.000-39.999	42	11.7
	High school graduate	33	9.2		$10.000-49.999	39	10.8
	Some college	56	15.6		$10.000-59.999	45	12.5
	2-year degree	28	7.8		$10.000-69.999	24	6.7
	4-year degree	180	50.0		$10.000-79.999	30	8.3
	Master degree	59	16.4		$10.000-89.999	17	4.7
	Doctorate	3	.8		$10.000-99.999	26	7.2
					≥$100.000	61	16.9
Total		360	100	Total		360	100

CHAPTER 4. RESULTS

4.1 Manipulation Check

We conducted two pretests. To figure out the differences between an actual disease (i.e., heart attack) and the factitious disease (i.e., thorny nausea disease) on the level of psychological reactance, in the first pretest, we used 86 participants who did not participate in the main experiment. Participants received a monetary reward ($0.5) for their participation. 33 participants were excluded from the sample because they did not pass the test to screen out random clicking. In all, 53 individuals participated in this pretest. The result of the *t*-test showed no difference between the two diseases at the level of psychological reactance (t (51)= .43, p = .67: 1. $M_{heart\ attack}$ = 3.48 (N = 26) and SD = 1.97 and 2. $M_{thorny\ nausea\ disease}$ = 3.26 (N = 27) and SD = 1.67). As a result, in the second pretest, we only utilized the factitious disease.

A second pretest was conducted using 61 participants who did not participate in the main experiment. Participants received a monetary reward ($0.5) for their participation. Six participants were excluded from the sample because they were not able to pass the test to screen out random clicking. In all, 55 individuals participated in the pretest. To check the social distance frame condition, two items were measured by asking, "Based on the e-smoking cessation campaign message you read, who will have the most impact on the disease mentioned in the poster?" and "Based on the e-smoking cessation campaign message you read, who will benefit from quitting e-smoking about the disease mentioned in the poster?" The participants responded on a 7-point scale (where 1 = me and 7 = other people). To check the hypothetical distance frame condition, two items were measured using a 7-point scale (where 1 = low and 7 = high): "Based

on the e-smoking cessation campaign message you read, how likely do you think the probability

of having the disease mentioned in the poster will decrease?" and "Based on the e-smoking

cessation campaign message you read, how likely do you think that quitting e-smoking will

decrease possibility of having the disease mentioned in the poster?"

T-tests were conducted for social distance (me vs. others) and hypothetical distance (high

vs. low). First, social distance was statistically significant (t (48.49) = -4.95, $p <$ .05: 1. M_{me} =

2.72 (N = 27) and SD = 2.05 and 2. M_{others} = 5.16 (N = 28), SD = 1.56)). Second, hypothetical

distance was statistically significant (t (53) = 2.24, $p <$.05: 1. M_{high} = 4.81 (N = 26) and SD =

1.52 and 2. M_{low} = 3.91 (N = 29, SD = 1.44)). Thus, the results of the *t*-test were clearly

manipulated, as we intended.

4.2 Hypothesis Testing

Before testing the hypotheses, we also conducted manipulation check in our main test.

The results of the *t*-test were clearly manipulated, as the second pre-test did. First, social distance

was statistically significant (t (349.64) = -8.38, $p <$ .001: 1. M_{me} = 3.37 (N = 184) and SD = 2.01

and 2. M_{others} = 4.99 (N = 176), SD = 1.64)). Second, hypothetical distance was statistically

significant (t (333.6) = 6.46, $p <$.05: 1. M_{high} = 4.84 (N = 177) and SD = 1.33 and 2. M_{low} = 3.76

(N = 183, SD = 1.82)).

This study used IBM SPSS and Hayes' PROCESS to test the hypotheses. First, to test the

main effects of social distance (H1) and hypothetical distance (H2), we utilized the *t*-test. We

assumed that a near psychological distance frame would lead to decreased psychological

reactance for e-smoking cessation campaigns compared to a distant psychological distance

frame. The result of the *t*-test for social distance indicated that respondents who were exposed to

the near social frame showed a higher level of psychological reactance than those exposed to the

distant social frame (t (358) = 2.01, p <.05: 1. M_{me} = 3.87 (N = 184) and SD = 1.59 and 2. M_{others} = 3.52 (N = 176, SD = 1.66)). The result showed the opposite direction from H1. Thus, H1 was not supported, although it was statistically significant.

However, unlike we predicted, the result of the *t*-test for hypothetical distance indicated that respondents exposed to the high hypothetical distance frame showed a higher level of psychological reactance than those exposed to the low hypothetical distance frame (t (358) = .38, p >.05: 1. M_{high} = 3.73 (N = 177) and SD = 1.71 and 2. M_{low} = 3.67 (N = 183, SD = 1.56)). The result showed the opposite direction from H2. Thus, H2 was not supported (see Table 2).

Table 2. T-test Results for Message Frames on Psychological Reactance

	Near		Distant			
	M	SD	M	SD	*t*	*p*
Social Distance	3.87	1.59	3.52	1.66	2.01	.045*
Hypothetical Distance	3.73	1.71	3.67	1.56	.38	.71

* = p < 0.05.

H3 predicted that there would be the interaction effect of social frames and hypothetical frames on psychological reactance for e-smoking cessation campaigns. We utilized two-way analyses of variance (ANOVAs; social distance × hypothetical distance). Table 3 presents the descriptive statistics for dependent variables.

A two-way ANOVA revealed that the main effect of social distance on psychological reactance for e-smoking cessation campaigns (F (1, 356) = 4.06, p < .05, partial η^2 = .011) was statistically significant, but the mai0n effect of hypothetical distance (F (1, 356) = .15, p > .05, partial η^2 = .000) was not statistically significant. There was no significant interaction effect (F (1, 356) = .08, p > .05, partial η^2 = .000: 1. $M_{me\ and\ high}$ = 3.93 and SD = 1.68, 2. $M_{me\ and\ low}$ = 3.81

and SD = 1.51, 3. $M_{others\ and\ high}$ = 3.53 and SD = 1.73, and 4. $M_{others\ and\ low}$ = 3.52 and SD = 1.61).

Thus, H3 was not supported (see Table 4).

Table 3. Descriptive Statistics for Psychological Reactance

Social	Hypothetical	*M*	*SD*	*N*
Me	High	3.93	1.68	90
	Low	3.81	1.51	94
	Total	3.84	1.59	184
Others	High	3.53	1.73	87
	Low	3.52	1.61	89
	Total	3.52	1.67	176
Total	High	3.73	1.71	177
	Low	3.67	1.56	183

Table 4. Result of Two-way ANOVA for Psychological Reactance

DV	IV	*df*	*MS*	*F*	*p* value
Psychological	Social	1	10.80	4.06	.045*
reactance	Hypothetical	1	.39	.15	.703
(N = 360, R^2 = .012, adj. R^2 = .004)	Social × Hypothetical	1	.22	.08	.774

* = $p < 0.05$.

In addition, RQ1 asked how participants exposed to a message using a near social frame and low hypothetical frame would experience psychological reactance compared to participants exposed to a message using a distant social frame and high hypothetical frame. Based on the

result, participants exposed to the message using a near social frame and high hypothetical frame showed a higher level of psychological reactance than those exposed to the message using a distant social frame and high hypothetical frame.

H4 predicted that low message fatigue from anti-smoking campaigns would lead to decreased psychological reactance for e-smoking cessation campaigns. As we predicted, the result of the simple linear regression indicated that respondents who had lower message fatigue from anti-smoking campaigns showed a lower level of psychological reactance than those who had higher message fatigue from it ($\beta = .69$). The overall model fit was 27.2% of the variance of psychological reactance (F (1, 358) = 133.56, $p < .001$). Thus, H4 was supported.

Meanwhile, RQ2 asked how other combinations of a social frame, a hypothetical frame, and message fatigue would impact the level of psychological reactance. To test RQ2, we utilized Model 3 via the Hayes' PROCESS with 5,000 subsample bootstrapping. It indicated that the direct path from message fatigue to psychological reactance was positive and statistically significant ($\beta = .6838$, S.E. = .0600, and $p < .001$). However, none of the other direct paths was statistically significant and none of the interaction terms was statistically significant. Based on the result, the order of the level of psychological reactance was as follows: 1. $M_{me\ and\ high}$ with high message fatigue = 4.64, 2. $M_{others\ and\ high}$ with high message fatigue = 4.58, 3. $M_{others\ and\ low}$ with high message fatigue = 4.50, 4. $M_{me\ and\ low}$ with high message fatigue = 4.48, 5. $M_{me\ and\ low}$ with low message fatigue = 3.18, 6. $M_{me\ and\ high}$ with low message fatigue = 2.87, 7. $M_{others\ and\ low}$ with low message fatigue = 2.76, 8. $M_{others\ and\ high}$ with low message fatigue = 2.57 (where 1 = the highest level of psychological reactance and 8 = the lowest level of psychological reactance) (see Table 5).

Table 5. Result of Model 3 via the Hayes' PROCESS

Reactance	Coeff.	S.E.	t	p value	LLCI	ULCI
Social (A)	-.1868	.1487	-1.2561	.2099	-.4792	.1057
Hypothetical (B)	.0680	.1487	.4572	.6478	-.2245	.3605
Fatigue (C)	.6838	.0600	11.4013	.0000***	.5658	.8017
A x B	-.0177	.2974	-.0596	.9525	-.6027	.5673
A x C	.1388	.1199	1.159	.2477	-.0970	.3747
B x C	-.1505	.1201	-1.2537	.2108	-.3867	.0856
A x B x C	.0767	.2400	.3194	.7496	-.3954	.5488

R^2 = .2822, MSE = 1.9572, F = 19.7722, df1 = 7, df2 = 352, and p <.001***

Note. 5000 Bootstrapping samples; LL & UL = lower level and upper level and confidence interval at 95%.
*** = p < 0.001.

H5 predicted that lower psychological reactance toward the e-smoking cessation campaign would lead to increased positive attitude for the e-smoking cessation campaign message. As we predicted, the result of the simple linear regression indicated that respondents who had a lower level of psychological reactance showed a higher positive attitude for the e-smoking cessation campaign message than those who had a higher level of psychological reactance (β = -.12). The overall model fit was 1.4% of the variance of attitude (F (1, 358) = 5.17, p < .05). Thus, H5 was supported.

H6 predicted that positive attitude toward the e-smoking cessation message in the

campaign would lead to an increased intention to quit e-smoking. The result of the simple linear regression indicated that respondents who had a positive attitude toward the e-smoking cessation message showed a higher intention to quit e-smoking than those had a negative attitude toward it (β = .45). The overall model fit was 20.7% of variance of intention (F (1, 358) = 93.59, p < .001). Thus, H6 was supported.

H7 predicted that decreased psychological reactance would lead to an increased intention to quit e-smoking. The result of the simple linear regression indicated that respondents who had a lower level of psychological reactance for the e-smoking cessation campaign showed a higher intention to quit e-smoking than those who had a lower level of psychological reactance for it (β = -.22). The overall model fit was 4.6% of variance of intention (F (1, 358) = 17.13, p < .001). Thus, H7 was supported.

H8 predicted that attitude toward the e-smoking cessation campaign message would significantly mediate the relationship between psychological reactance and intention to quit e-smoking. The result of Model 4 via the Hayes' PROCESS with 5,000 subsample bootstrapping indicated that the direct path from psychological reactance to attitude was negative and statistically significant (β = -.1220, S.E. = .0537, and p < .05). Moreover, the path from psychological reactance to intention was negative and significant (β = -.1650, S.E. = .0476, and p < .001), indicating that respondents with a lower level of psychological reactance are more likely to express an intention to quit e-smoking than those with a higher level of the measure. The direct effect of attitude on intention was positive and significant (β = 4350, S.E. = .0466, and p < .001), indicating that respondents with a higher attitude are more likely to express an intention to quit e-smoking than those with a lower attitude. Finally, the indirect effect was tested using non-parametric

bootstrapping, showing that the indirect effect of attitude (IE = .0531) was statistically

significant: 95%CI= (-.1088 and -.0016). Thus, H8 was supported (see Table 6).

Table 6. Result of Model 4 via the Hayes' PROCESS

Reactance		Coeff.	S.E.	*t*	*p* value	LLCI	ULCI
	a	-.1220	.0537	-2.27	.02*	-.2276	-.0165
Intention to quit	b	.4350	.0466	9.3385	.0000***	.3434	.5266
e-smoking (n =	c'	-.1650	.0476	-3.4635	.0006***	-.2587	-.0713
360)	c	-.2181	.0527	-4.1389	.0000***	-.3217	-.1145

IE = -.0531, Boot SE.0271, and Boot CI = -.1088 to -.0016.

Note. 5000 Bootstrapping samples; LL & UL = lower level and upper level and confidence
interval at 95%.
* = *p* < 0.05 and *** = *p* < 0.001.
a = the path from psychological reactance to attitude.
b = the path from attitude to intention.
c' = the direct path from psychological reactance to intention.
c = the total effect.
IE = the indirect effect within 95% CI.

CHAPTER 5. DISCUSSION

The results of this study underscore the importance of considering reactance effects to improve the effectiveness of campaigns. The findings not only extend those from earlier studies on psychological reactance, message fatigue, and psychological distance (based on CLT), but also provide practical suggestions for campaigners and practitioners to improve the overall campaign strategies.

Hypothesis 1 predicted that a near social frame would lead to decreased psychological reactance for e-smoking cessation campaigns compared to a distant social frame. The analysis of social frames on psychological reactance showed that the near social frame led to a higher level of psychological reactance compared to the distant social frame. This finding was in the reverse direction of what we had hypothesized. Research on this topic by Nan (2007) showed that a distant social frame in the gain message frame resulted in more favorable issue judgment than a near social frame. The author explained that a near social frame might lead to a feeling of less vulnerability to disease than a distant social frame because of the possibility of self-positivity bias. Self-positivity bias is a phenomenon in which people are likely to believe that they experience negative events less often than other people (Fields & Kuperberg, 2015; Lin et al., 2003). Based on Nan's (2007) research, it can be argued that e-smokers exposed to the near social frame had a higher level of psychological reactance than those exposed to the distant social frame because people exposed to the near social frame may have lower vulnerability to the disease mentioned in the stimulus. Hence, the results of the current study could explain the result of the social distance by differential perceived risk by considering factors such as the level of vulnerability.

Another explanation for the result could be that smokers might not directly know about others' health issues caused by e-smoking, which means that they are less likely to refuse the message information. When smokers who have smoked for a fairly long time have not yet experienced any health issues related to the disease mentioned in the stimulus, they might discount the information provided in the stimulus and instead perceive the message as a threat to their freedom to continue e-smoking. Moreover, most people may believe that nothing bad can happen to them, so when they see a message that questions this illusion, they may experience more reactance effect as well. Hence, people exposed to the near social frame could show a higher level of psychological reactance. The result of the current study is similar to the findings of Nan's (2007) study. However, the current study did not include mediators, such as perceived vulnerability to the disease in the experiment design. Future studies on this topic could cover the logical role of perceived vulnerability to determine if evidence exists to prove that the near social distance frame results in a higher level of psychological reactance due to the role of perceived vulnerability. Figure 2 presents an estimated revision model.
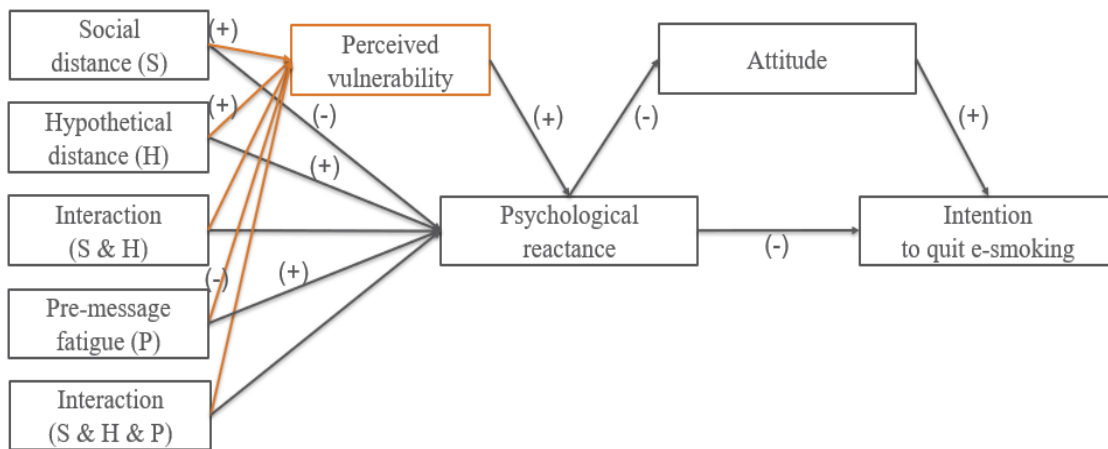

Figure 2. The Estimated Revision Model

Hypothesis 2 predicted that a high hypothetical frame would lead to decreased psychological reactance for e-smoking cessation campaigns compared to a low hypothetical

frame. The analysis of data examining the effects of hypothetical frames on psychological reactance showed that a high hypothetical distance frame led to a higher level of psychological reactance compared to a low hypothetical distance frame, but this difference was not statistically significant. This lack of significance can be explained by the fact people have different reference points of hypothetical. We conducted manipulation checks during the pretests to manipulate the difference of hypotheticality operationalized that the high hypothetical distance frame was the high possibility of benefitting from quitting e-smoking, whereas the low hypothetical distance frame was the low possibility of benefitting from quitting e-smoking. However, it is possible that, despite our attempts to design the measure effectively, some participants might understand our stimulus differently based on their own reference points. In other words, there is no clarity of the standard point at which a percentage is high or low. Thus, the possibility of the 58% reduction of contracting the disease provided by a high hypothetical frame might not always be regarded as a high possibility. Conversely, the possibility of the 2% reduction of contracting the disease provided by a low hypothetical frame might not always be regarded as a low possibility. This might be one of the reasons we had a different result than previous studies. Future studies should consider more extreme message variations in terms of hypotheticality.

According to the psychological distance in CLT, an event with a low level of psychological distance is considered more concrete and serious and uses a lower-level construal process (Trope & Liberman, 2010). This often results in positive responses from campaigns (Park & Park, 2016). However, the results of the current study showed that a near psychological distance projected into message frames resulted in a negative response (i.e., the higher level of psychological reactance), which ultimately led to a decrease in positive responses (i.e., attitude and intention). This may be attributed to the fact that people might view the campaign more

carefully when exposed to a near distant frame, which might cause people to think of different dimensions, such as the negative aspects of the campaign itself. For example, based on the psychological distance, the overall forest will be regarded as a distant psychological distance while one tree in the forest will be regarded as a near psychological distance. Through the close-up, when people see the tree, they can also detect a wormhole or other details, which may cause negative feelings of the tree itself as well as positive feelings about protecting the tree from negative factors, such as a wormhole. Thus, negative feelings of the tree itself might be explained by the theory of psychological reactance while positive feelings about protecting the tree might be explained by CLT. Hence, when people are exposed to the near social distance message, rather than accept the benefits from quitting e-smoking, they might react negatively to the campaign itself by thinking that the campaign violated their freedom during the low level of the construal process. In terms of psychological reactance, this paper highlights the possibility of the elicitation of negative reactions.

Hypothesis 3 predicted that there would be an interaction effect of social frames and hypothetical frames on psychological reactance for e-smoking cessation campaigns. However, the analysis of the moderation term between the social distance frame and hypothetical distance frame showed no interaction effect between the two distance messages. An important fact to consider is that this result was in the same direction as the result of the social distance frame. Two psychological distance dimensions showed a consistent direction toward psychological reactance. In other words, people exposed to the message using a near social frame and high hypothetical frame showed the highest level of psychological reactance whereas people exposed to the message using a distant social frame and low hypothetical frame showed the lowest level of psychological reactance.

Hypothesis 4 predicted that low message fatigue would lead to decreased psychological reactance for e-smoking cessation campaigns compared to high message fatigue. As we predicted, message fatigue was positively associated with psychological reactance. People experiencing higher message fatigue showed a higher level of psychological reactance. According to the theory of psychological reactance, individual differences as internal variables influence the level of psychological reactance. In the current study, we regarded message fatigue as an internal factor, finding a positive relationship between message fatigue and psychological reactance, as previous studies did (e.g., Kim & So, 2018; So et al., 2017).

One of the critical findings in this study is that, although anti-smoking and e-smoking were different dimensions, message fatigue from anti-smoking campaigns influenced psychological reactance for e-smoking cessation campaigns. This is because people might regard both quitting smoking and quitting e-smoking messages as the same type of message restricting their behavior. Hence, negative responses caused by anti-smoking campaigns might prime the responses to e-smoking cessation campaigns.

RQ2 examined how the other combinations of a social frame, a hypothetical frame, and message fatigue would impact the level of psychological reactance. The results showed that message fatigue as an internal factor was the most powerful factor influencing the level of psychological reactance. Based on the result of H3, the main effect of the social frame was statistically significant, but based on the result of RQ2, the main effect of message fatigue was the only statistically significant factor. In other words, when people already had a negatively preexisting attitude toward anti-smoking campaigns, message variations using psychological distance might have a slight impact on the decrease in psychological reactance. To increase the effectiveness of e-smoking campaigns, campaigners should consider message fatigue from anti-

smoking campaigns as internal factors as well as simultaneously determine how to improve e-smoking campaigns via the message variations as external factors, as previous studies have mentioned (Brehm &Brehm, 1981; Miron & Brehm, 2006; Rosengerg & Siegel, 2018). Future studies should consider how to reduce message fatigue from the anti-smoking campaign, and what factors might reduce message fatigue from it to increase the effectiveness of e-smoking cessation campaigns.

Hypothesis 5 predicted that lower psychological reactance toward the e-smoking cessation campaign would lead to increased positive attitude for the e-smoking cessation campaign message. As we predicted, the data analysis showed that psychological reactance was negatively associated with attitude toward e-smoking cessation messages, as previous studies have found (e.g., Dillard & Shen, 2005; Rains, 2013; Steindl et al., 2015).

Hypothesis 6 predicted that positive attitude toward the e-smoking cessation message in the campaign would lead to increased intention to quit e-smoking. The results showed the positive relationship between attitude toward the e-smoking cessation message and intention to quit e-smoking, which concurs with previous studies (e.g., Dillard & Shen, 2005; Miller et al., 2007; Quick et al., 2011; Steindl et al., 2015). This result supports the causal link between attitude and behavioral intention confirmed by the theories of reasoned action and planned behavior (Ajzen, 1991).

Hypothesis 7 predicted that decreased psychological reactance would lead to increased intention to quit e-smoking. The data analysis indicated the existence of the negative relationship between the arousal of psychological reactance and behavioral intention. This result is in line with the findings of Dillard and Shen's (2005) study using the alcohol context.

Hypothesis 8 predicted that attitude toward the e-smoking cessation campaign message would significantly mediate the relationship between psychological reactance and intention to quit e-smoking. This study found evidence of the mediated role of attitude between psychological reactance and intention. This finding is in line with the findings from Dillard and Shen's (2005) study based on flossing behavior. This finding also extended earlier studies on psychological reactance in e-smoking cessation contexts. To increase the intention to quit e-smoking, campaigners should devise ways to first ensure that people have a positive attitude toward the e-smoking cessation message.

The results of the current study provided several theoretical implications. First, as previous studies have found, different message types influence psychological reactance (e.g., gain vs. loss framing; Cho & Sands, 2011); the current study also showed the possibility that message types using social distance based on CLT can influence the level of psychological reactance. Previous studies based on CLT have been more focused on examining the positive relationship between message types and the persuasiveness of campaigns (i.e., attitude and intention). The current study examined this relationship, with psychological reactance negatively influencing persuasiveness of campaigns. It found that, in terms of psychological reactance, there was oppositional direction with the premise of CLT, which provides a different point of view.

Second, the present study advances research on the determinants of psychological reactance in e-smoking cessation campaigns, especially message fatigue as an internal factor. As noted in the literature review, the revised version of the theory of psychological reactance (Brehm, 1981) regards individual differences as key variables influencing psychological reactance. In this study, we utilized preexisting message fatigue from anti-smoking campaigns as one of the individual differences as an internal factor. The study not only examined the positive

relationship between message fatigue and psychological reactance, as previous studies have suggested (e.g., Kim & So, 2018; So et al., 2017), but also showed that preexisting message fatigue from anti-smoking campaigns negatively influenced the persuasiveness of e-smoking cessation campaigns. In other words, negative responses caused by anti-smoking campaigns can prime individuals' responses to e-smoking cessation campaigns.

Based on the result of this study, the relationship between message fatigue and psychological reactance might apply to other types of health campaigns related to restricting people's behaviors, such as anti-marijuana and anti-sugar campaigns. This is because those campaigns might also elicit the message fatigue due to the excessive exposure to the core message focusing on restricting their behavior. It might cause increased psychological reactance, which is likely to lead to the decreased effectiveness of campaigns. Hence, the current study suggests not only the possibility that other health-related campaigns need to consider the relationship between message fatigue and psychological reactance, but also the possibility that negative prime effect might be able to occur when people regard the recommended message in health campaigns as restricting their behavior, and having message fatigue.

The results of the current study also provide practical implications. To make e-smoking cessation campaigns more efficiently, campaigners or practitioners related to e-smoking cessation campaigns also need to rethink the relationship between anti-smoking campaigns and e-smoking cessation campaigns in terms of the negative prime effect. In other words, they need to consider how to reduce the unintended effects stemming from anti-smoking campaigns influencing the persuasiveness of e-smoking cessation campaigns. It ultimately has a positive impact on the effectiveness of the campaigns as well as how to improve their message strategies.

In addition, message fatigue is one of the critical factors to ultimately determine the effectiveness of the e-smoking cessation campaign. In other words, if campaigners or practitioners can deal with how to reduce message fatigue from anti-smoking campaigns, the effectiveness of the e-smoking cessation campaign might increase. Hence, this study suggests that future researches should investigate where message fatigue comes from and what factors might reduce message fatigue.

Although the current study provides new insights into understanding the effect of e-smoking cessation campaign messages based on psychological distance on psychological reactance, attitude, and intention to quit e-smoking, it nonetheless has a few limitations that should be noted. First, the participants in this study were residents of the United States who were over the age of 18, and participation was limited to e-smokers. This sample is not representative of the general population of e-smokers. In addition, given the fact that the e-cigarette smoking rate has been rapidly increasing among adolescents, it is important to include adolescents as samples in e-smoking cessation campaign studies. Future researches should consider recruiting from a diverse population, including residents of different countries and the population of adolescents.

Second, the current study considered social distance and hypothetical distance among four psychological distances listed in CLT (Trope & Liberman, 2010). However, everyday events in people's lives, such as e-smoking cessation issues, involve not only social distance and hypothetical distance, but also spatial distance and temporal distance as multidimensional approaches (Park & Park, 2016; Trope & Liberman, 2010). Future researchers should consider other dimensions of psychological distance, such as temporal and spatial distance, as well as the interaction terms of all types of psychological distance.

Third, in the current study, we more focus on each main effect of psychological distance frame and message fatigue on psychological reactance. However, future researches should consider adding demographic information as well. It might show the overall increased explanation rate and other potential moderating roles between psychological distance frame or message fatigue and psychological reactance.

Finally, e-smoking behavior is not a one-time behavior. Exposure to the e-smoking cessation message via the online experiment was allowed to play a role in a relatively short time due to the limitation of the cross-sectional study. In other words, although the current study included a manipulation check via the pretest, there might still be a possibility that a few participants might not have fully understood the message features and designs involved in the message. Future researchers should consider other ways of the manipulation check as well as repetitive approaches with different message designs and features to potentially reduce any unintended effects as a longitudinal study approach.

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Appendix A: Stimulus materials

1. A near social and high hypothetical frame

Figure 3. A Near Social and High Hypothetical Frame Condition

2. A near social and low hypothetical frame

Figure 4. A Near Social and Low Hypothetical Frame Condition

3. A distant social and high hypothetical frame

Figure 5. A Distant Social and High Hypothetical Frame Condition

4. A distant social and low hypothetical frame

Figure 6. A Distant Social and Low Hypothetical Frame Condition

1. Pre-Stimulus Exposure Questions

Q1: Message Fatigue questions (7-point Likert scale, strongly disagree – strongly agree)

Overexposure
- I have lost track of the amount of times I have heard that cigarette smoking is a serious problem.
- At this point, I've heard about problems related to cigarette smoking more than I ever needed to.
- I have heard enough about how important it is to stay away from cigarette smoking.
- There are simply too many health messages about cigarette smoking nowadays.
- The importance of maintaining a cigarette smoking cessation is overtaught.

Redundancy
- Cigarette smoking cessation messages rarely provide new information.
- After hearing smoking cessation campaigns for years, messages on anti-smoking seem repetitive.
- Messages about cigarette smoking cessation are all beginning to sound the same to me.
- I can predict what a message about cigarette smoking cessation is going to say.

Exhaustion
- I am burned out from hearing that cigarette smoking is a serious problem.
- I am sick of hearing about consequences of cigarette smoking.
- I am tired of hearing about the importance of maintaining a cigarette smoking cessation.
- Cigarette smoking cessation messages make me want to sigh.

Tedium
- Health messages on anti-smoking are boring.
- Cigarette smoking cessation messages make me want to yawn.
- I find message about cigarette smoking cessation to be dull and monotonous.
- Cigarette smoking cessation messages are tedious.

2. Post-Stimulus Exposure Questions

Now that you have viewed the poster, you will be asked a few questions based on your impression of the poster.

Q2: Manipulation check questions (7-point scale)

- Based on the e-smoking cessation campaign message you read, who will have the most impact on the disease mentioned in the poster?

  Me - Other people

- Based on the e-smoking cessation campaign message you read, who will benefit from quitting e-smoking about the disease mentioned in the poster?

  Me - Other people

- Based on the e-smoking cessation campaign message you read, how likely do you think of the probability of the decrease in having the disease mentioned in the poster?
  Low – High

  - Based on the e-smoking cessation campaign message you read, how likely do you think the possibility that quitting e-smoking will decrease the disease mentioned in the poster?
  Low – High
  -

Q3: Psychological reactance questions (7-point Likert scale, strongly disagree – strongly agree)

In this section we will ask you questions about your feeling when you saw the message. Please respond to each question on a one to seven scale where 1= Strongly disagree and 7 = Strongly agree. Please answer the following questions as honestly as you can. There are no right or wrong answers to these questions for these questions.

Anger
- I felt irritated when I viewed the e-smoking cessation campaign message.
- I felt angry when I viewed the e-smoking cessation campaign message.
- I felt annoyed when I viewed the e-smoking cessation campaign message.
- I felt aggravated when I viewed the e-smoking cessation campaign messages.
Counterargument
- I actively came up with many arguments against the message
- I found myself thinking of ways I disagreed with what was being presented.
- I found myself looking for flaws in the message presented.
- I thought the sources of the information were probably not credible.

Q4: Attitude questions

Please indicate your opinion of the advertisement that you just viewed (7-point semantic differential scale)
- Bad – Good
- Unfavorable – Favorable
- Negative – Positive

Q5: Intention questions (7-point Likert scale, strongly disagree – strongly agree)

- I intend to quit e-smoking
- I will make an effort to quit e-smoking
- I will try to quit e-smoking

Q6: Demographic information questions

- What is your gender?
    Male
    Female

Others (specify)
- What is your age?
- Would you describe yourself as:
  - White
  - Black or African American
  - American Indian or Alaska Native
  - Asian
  - Native Hawaiian or Pacific Islander
  - Other
- What is your marital status?
  - Married
  - Widowed
  - Divorced
  - Separated
  - Never married
- What is your highest qualification?
  - Less than high school
  - High school graduate
  - Some college
  - 2-year degree
  - 4-year degree
  - Master degree
  - Doctorate
- What is your currently employment status?
  - Employed full time
  - Employed part time
  - Unemployed looking for work
  - Unemployed not looking for work
  - Retired
  - Student
  - Disabled
- Which income group does your household fall under?
  - Less than $10,000
  - $10,000 ~ $19,999
  - $20,000 ~ $29,999
  - $30,000 ~ $39,999
  - $40,000 ~ $49,999
  - $50,000 ~ $59,999
  - $60,000 ~ $69,999
  - $70,000 ~ $79,999
  - $80,000 ~ $89,999
  - $90,000 ~ $99,999
  - $100,000 ~ $149,999
  - More than $150,000
- What do you smoke?
  - E-cigarettes

E-cigarettes and traditional cigarettes
- How many cigarettes do you smoke in a day?
- How long have you smoked traditional cigarettes?
- How many times do you smoke the electric cigarette in a day?
- How long have you smoked e-cigarettes?