TO BE OR NOT TO BE:
THE EFFECTS OF CULTURAL VALUE APPEALS IN HEALTH PERSUASION

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ABSTRACT

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This study investigated the effects of cultural value appeals in health persuasion. Situated in the COVID-19 pandemic, this study examined if and how individualistic and collectivistic message frames can improve attitudes and behaviors related to the use of face masks among European Americans and Asian Americans. This study was a 2 (message frame: individualistic versus collectivistic) × 2 (audience ethnicity: European versus Asian American) between-subjects pretest-posttest quasi-experimental design. Results showed that for European Americans, collectivistic versus individualistic appeals were more effective to improve attitudes and behavioral intention. For Asian Americans, both individualistic and collectivistic appeals predicted significant changes in attitudinal and behavioral outcomes, but individualistic appeals resulted in greater behavioral change than collectivistic appeals. While the mechanisms through which cultural value appeals had impacts on Asian Americans remained unclear, perceived message relevance and counter-arguing were significant mediators explaining the effects of message frames on behavioral outcomes for European Americans.

Keywords: cultural congruency effects, individualism—collectivism, message relevance, counter-arguing, Asian American

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INTRODUCTION

Adapting to audience's cultural values is thought to be an important element in effective persuasion. For instance, a large body of research in advertising has demonstrated that advertisement appeals adapted to the audience's cultural values were more effective than unadapted ones (see, e.g., Aaker & Schmitt, 2001; Aaker & Williams, 1998; Chang, 2006; Han & Shavitt, 1994; Hoeken et al., 2003). In health communication, evidence is also emerging in terms of the persuasive effects of cultural value appeals. Specifically, when comparing the effects of individualistic and collectivistic appeals, some studies found that congruency between recipient's cultural value orientation and the message frame can increase message persuasiveness, which is known as the cultural congruency effects (see, e.g., Uskul & Oyserman, 2010). However, more studies on this topic reported mixed findings (see, e.g., Chung & Ahn, 2013; Han & Jo, 2012; Lee & Park, 2012; Murray-Johnson et al., 2001), and a few studies even discovered cultural incongruency effects (see, e.g., Ko & Kim, 2010; Yu & Shen, 2013). Additionally, research on the mechanisms through which cultural value appeals persuade is insufficient in existing literature.

In an attempt to address these limitations and gain better knowledge, this study investigated the effects of cultural value appeals in health persuasion and explored the mechanisms through which cultural value appeals had impacts on persuasive outcomes. This paper first presented the overarching theoretical framework and key concepts related to the current inquiry. Next, this paper reviewed empirical evidence in existing literature regarding the persuasive effects of cultural value appeals and discussed possible explanations for such effects. Then, the current study was introduced, research hypotheses were presented, and a quasi-experiment was designed to test these hypotheses. Finally, this paper presented the study results

and discussed the theoretical and practical implications of these findings, as well as the limitations and suggestions for future research.

CULTURAL SENSITIVITY APPROACH

There is growing awareness that communication about health needs to take cultural characteristics into account to be most effective (see, e.g., Betsch et al., 2016; Dutta, 2007; Kreuter & Haughton, 2006; Kreuter & McClure, 2004; Kreuter et al., 2003). The cultural sensitivity approach (Resnicow et al., 1999) focuses on developing culturally appropriate health communication strategies. In this context, culture is defined as a collection of shared values, beliefs, and practices that are transmitted intergenerationally within a community (Betancourt & Lopez, 1993; Brislin, 1993; Rohner, 1984; Kreuter & Haughton, 2006; Kreuter et al., 2003).

According to Resnicow et al. (1999), cultural sensitivity refers to the extent to which ethnic/cultural characteristics, experiences, norms, values, and beliefs of the target audience are incorporated in the design, delivery, and evaluation of health promotion efforts. Specifically, this paper is interested in the phase of message design, that is how health messages are customized to the cultural characteristics of the target audience. Depending on the level of specificity with which characteristics of the target audience are reflected in messages, there are two major approaches, namely cultural targeting and tailoring.

Cultural Targeting versus Tailoring

Cultural targeting is to design messages for some population subgroups based on characteristics shared by their group members (Kreuter & Wray, 2003; Kreuter et al., 2003). In health communication, "the process of partitioning large, heterogenous populations into smaller, more homogenous subgroups" (Kreuter & McClure, 2004, p. 441) is called audience segmentation (Slater, 1996). Cultural targeting is based on an understanding of the needs and concerns of a specific audience segment or group. Cultural tailoring, on the other hand, is to create personalized messages for an individual based on specific characteristics of that person

(Kreuter & Skinner, 2000; Kreuter & Wray, 2003; Kreuter et al., 2003; Noar et al., 2009). In other words, cultural tailoring is to use data about an individual's beliefs, traits, or abilities to customize the information for a specific person.

It is not yet known if targeted or tailored messages are more effective, but there are situations when each approach is more advantageous than the other. When individuals within a population or subgroup vary significantly on key determinants of the intended outcome, tailored messages have the potential to address these individual-level variables and produce highly customized messages (Kreuter & Haughton, 2006; Kreuter & Wray, 2003). However, tailored messages require gathering data at the individual level, and oftentimes there is no mechanism to do so, or the costs to do so are high (Kreuter & Haughton, 2006; Kreuter & Wray, 2003).

In comparison, targeted messages address cultural characteristics at the group level. When key determinants of the intended outcome vary at the group level, targeted messages can achieve similar levels of customization as tailored messages, with an additional advantage of being cost-effective. In fact, Kreuter and Wray (2003) found that when targeted messages were perceived to be a good fit, there were very few differences between targeted and tailored messages in terms of message effects. Nonetheless, the comparative costs and benefits of targeted and tailored messages remain empirical questions.

This paper focuses on cultural targeting, that is to design messages for cultural groups based on characteristics shared by group members. Communication messages can be responsive to the target culture at two levels—surface structure and deep structure (Hall, 1976; Resnicow et al., 1999).

Surface Structure versus Deep Structure

Corresponding to the Cultural Iceberg Model (Hall, 1976), culture at the surface level is clearly visible to cultural outsiders, as expressed in artifacts, language, social rituals, norms, and other superficial characteristics of a culture. Health communication practitioners often package health information in certain colors, fonts, and images that involve people, places, language, music, food, or clothing familiar to and preferred by the target audience (Kreuter & Haughton, 2006; Kreuter & McClure, 2004; Kreuter et al., 2003; Resnicow et al., 1999). This has been labeled the peripheral approach (Kreuter et al., 2003), in reference to Petty and Cacioppo's (1981) description of the peripheral route of information processing.

Culture at the deep level involves values and beliefs—the basic assumptions and judgments of the world that are deeply ingrained in members of a certain cultural group, but less accessible or hardly understood by cultural outsiders (Hall, 1976; Resnicow et al., 1999). When cultural values and beliefs are recognized, reinforced, and built on to provide context and meaning to health information, this is called the sociocultural approach (Kreuter et al., 2003). For instance, if religiosity is an important cultural value to the target audience, the message encouraging breast cancer screening can be framed as: "Getting a mammogram together with the power of prayer gives us the best chance to lead a long and healthy life in the service of God" (Kreuter & Haughton, 2006, p. 797).

Resnicow et al. (1999) proposed that although surface structure generally increases receptivity of messages, deep structure determines the efficacy or impact of messages. It is possible that culturally congruent audiovisual elements seem immediately perceptible, familiar, and comfortable for the target audience and create interest in consuming the information, but the underlying cultural values and beliefs are more likely to be influential on people's attitudes and

behaviors. A meta-analysis conducted by Huang and Shen (2016) found that in cancer communication interventions, targeting and/or tailoring at the deep level of culture (r = .188) had greater impacts on attitudinal and behavioral outcomes than that at the surface level (r = .035). However, evidence on this matter is still very limited.

This paper looks at cultural targeting at the deep structure, that is targeted messages addressing cultural values that characterize a group of people. The next section of this paper will discuss cultural value orientations and their impacts on audience response to persuasive messages.

CULTURAL VALUE APPEALS

Adapting to audience's values is thought to be an important element in effective persuasion. A large body of research in consumer advertising has demonstrated that advertisements with appeals adapted to the audience's cultural values were more effective than appeals that are unadapted (see, e.g., Aaker & Schmitt, 2001; Aaker & Williams, 1998; Chang, 2006; Han & Shavitt, 1994; Hoeken et al., 2003). A meta-analysis by Hornikx and O'Keefe (2009) found that cultural value appeals were more persuasive (r = .073) than unadapted ads overall. However, the effect was only significant when the appeals were based on values of individualism—collectivism (r = .105), but not when the appeals deal with other cultural value orientations such as uncertainty avoidance or masculinity—femininity (Hornikx & O'Keefe, 2009).

In health communication, evidence is also emerging in terms of the persuasive effects of cultural value appeals on individualism—collectivism. However, findings are far from unambiguous. While some studies provided support for cultural congruency effects (see, e.g., Uskul & Oyserman, 2010), more studies reported mixed findings (see, e.g., Chung & Ahn, 2013; Han & Jo, 2012; Lee & Park, 2012; Murray-Johnson et al., 2001), and a few studies even discovered cultural incongruency effects (see, e.g., Ko & Kim, 2010; Yu & Shen, 2013). Given these mixed and inconsistent findings in this area, more research is in need. The following sections will first discuss cultural values of individualism—collectivism, and then review empirical evidence on the effects of cultural value appeals based on individualism—collectivism in health messages.

Individualism—Collectivism

Individualism—collectivism (Hofstede, 1984; Markus & Kitayama, 1991; Triandis, 1995) as a group characteristic is "the degree to which people in a society are integrated into groups" (Hofstede, 2011, p. 11). In individualistic cultures, social ties between individuals tend to be loose, and everyone is expected to look after themselves and their immediate family. People with individualistic tendency focus on rights above duties and place priority on personal goals and desires over group goals or social welfare (Hofstede, 1984, 2011; Kim & Sherman, 2007; Markus & Kitayama, 1991; Oyserman et al., 2002; Triandis, 1995). Countries like the United States, Australia, and Netherlands are described as cultures in which typical individualistic values are endorsed (Hofstede et al., 2010).

In contrast, collectivistic cultures are characterized by strong social bonds and interconnectedness with in-group members. In collectivistic cultures, people are integrated into strong, cohesive in-groups, often extended families. They tend to focus on social, mutual obligations and are motivated to fulfill group expectations and group goals over individual rights or personal concerns (Hofstede, 1984, 2011; Markus & Kitayama, 1991; Triandis, 1995; Kim & Markus, 1999; Oyserman et al., 2002). Countries such as China, Singapore, Thailand, and South Korea are described as cultures in which typical collectivistic values are endorsed (Hofstede et al., 2010).

Persuasive health messages can address cultural values of individualism and collectivism through different message frames. An individualistic appeal often focuses on a person's own physical body and wellness and emphasizes the personal consequences of health-related behaviors. In contrast, a collectivistic appeal tends to focus on one's group and their collective health and emphasize the relational consequences of health-related behaviors (see, e.g., Chung &

Ahn, 2013; Han & Jo, 2012; Ko & Kim, 2010; Lee & Park, 2012; Murray-Johnson et al., 2001; Resnicow et al., 2002; Uskul & Oyserman, 2010; Yu & Shen, 2013).

Cultural Congruency Effects, or Not

In health persuasion, studies have provided some evidence that messages congruent with a group's cultural values of individualism—collectivism can be more effective in predicting attitudinal and behavioral outcomes. For instance, Uskul and Oyserman (2010) found that when persuading participants to reduce caffeine consumption, messages focusing on personal consequences increased favorable attitudes and behavioral engagement than messages focusing on relational obligations among European Americans. As for Asian and Asian Americans, relational-focused rather than self-focused message frame was more effective in predicting positive attitudes and message-congruent behaviors.

However, more studies reported rather mixed findings. For instance, Murray-Johnson et al. (2001) investigated the congruency effects of AIDS-prevention fear appeals on Mexican Americans and African Americans. They found that Mexican Americans were more frightened by messages that threatened the family than by messages that threatened the individual, while the opposite was true for African Americans. However, the pattern of cultural congruency effects was not significant when it came to attitudes or behavioral intentions.

In the context of anti-smoking ads, Chung and Ahn (2013) also explored the effects of self-related versus other-related fear appeals. In collectivistic culture (i.e., South Korean), other-related messages led to more favorable attitudes and greater behavioral intention than self-related messages. In individualistic culture (i.e., the United States), on the other hand, self-related messages resulted in greater behavioral intention than other-related messages, but the difference on attitudes was not significant. However, in Lee and Park (2012) also looking at anti-smoking

fear appeals, South Korean participants had similar attitudes and intentions when exposed to self-targeted and group-targeted messages, and the same was true for their U.S. counterparts.

Another study by Han and Jo (2012) looked at the effectiveness of cultural values in cancer screening campaign ads. They found that U.S. participants had more favorable attitudes to individualistic appeals than collectivistic appeals, whereas Japanese participants responded more favorably to collectivistic appeals than individualistic appeals. However, the same pattern was not observed for behavioral intention. Additionally, Han and Jo (2012) discovered no difference in the effects of individualistic and collectivistic appeals on attitudes or behavioral intention among Korean participants.

Some studies even discovered cultural incongruency effects. For instance, Yu and Shen (2013) looked at loss-framed messages about getting a flu shot. They found that among American participants, those who read an other-appeal reported more favorable attitudes and higher intention to get a flu shot than those who read a self-appeal, contrary to what cultural congruency effects would expect. Among Hong Kong Chinese participants, cultural congruency effects held true for behavioral intention but not for attitudes.

Another example is Ko and Kim (2010) studying safe sexual practices and condom use. European Americans were found to report less intention to use condoms in the future after being exposed to a personal-risk-framed message than a relational-risk-framed message, again suggesting cultural incongruency effects. Asian Americans, on the other hand, did not differ in their intention to use condoms when they saw a relational-risk-framed message or a personal-risk-framed message.

Not only does the literature show inconclusive results on the effectiveness of cultural value appeals, but also research on the mechanisms through which cultural value appeals

persuade is limited. To better understand this, the next section will explore potential explanations.

Mechanisms of Cultural Value Appeals

One explanation is provided by the Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1981). ELM posits that depending on the degree of elaboration, recipients can engage in two different approaches to message processing—the central route and the peripheral route. The central route is characterized by a thoughtful examination of the message and careful scrutiny of the arguments contained in the message. The peripheral route, on the other hand, involves heuristic principles and peripheral cues. ELM argues that persuasive outcomes obtained through the central route of processing are likely to be more stable over time and predictive of future behaviors, compared to that through the peripheral route of processing.

ELM suggests that one of the factors that influence the degree of elaboration is motivation. When the message is relevant and recipients have high involvement, they are motivated to engage in central route of processing. Message relevance is when recipients perceive the message to be related or applicable to them and their situation. Cultural value appeals may be perceived as more relevant, as they respond to recipients' cultural markers and provide culturally congruent views of and solutions to the issue at hand (see, e.g., Hawkins et al., 2008; Jensen et al., 2012; Kreuter & Wray, 2003; Rimer & Kreuter, 2006). As such, cultural value appeals are more likely to stimulate message engagement, which may include close attention, effortful thinking, and careful examination of the message—characteristics of the central route of processing. Therefore, cultural value appeals may achieve persuasive outcomes through recipients' perceived message relevance and message engagement.

However, ELM also points out that there are challenges to persuasion through the central route of processing. Effortful processing may evoke counter-arguing that could lessen message effects. Especially when the advocated position in the message is counter-attitudinal, recipients are likely to generate negative thoughts of the message, which renders the persuasive attempt unsuccessful. The issue of psychological reactance may be more salient with cultural value appeals. When recipients' cultural values are coupled with counter-attitudinal arguments, recipients are likely to experience psychological discomfort and cognitive dissonance (Festinger, 1957). Recipients may even feel their underlying values are challenged and their cultural identity is offended and threatened. To resolve these negative feelings, recipients are likely to engage in defensive processing of the message and counter-arguing to minimize the message (see, e.g., Ko & Kim, 2010; Yang & Nan, 2019). Therefore, cultural value appeals may fail to obtain persuasive outcomes due to recipients' counterarguing with the message.

Taken together, empirical evidence on the effectiveness of cultural value appeals in health communication contexts is mixed, and investigations on the mechanisms through which cultural value appeals influence persuasive outcomes are insufficient. Therefore, the current study attempts to address these limitations in existing literature.

CURRENT STUDY

According to the United States Census Bureau, the U.S. has become increasingly ethnically diverse. Ethnicity refers to a group of people who share a common ancestry, history, traditions, and cultural characteristics (Cokley, 2007). Within the U.S., different ethnic groups have maintained separate cultural identities and cultivated their own cultural value systems. A key element of ethnicity is how an individual self-identifies ethnically (Cokley, 2007).

Ethnic culture is comprised by the norms, values, and beliefs that are typical of an ethnic group (Phinney, 1996). For instance, Asian Americans have been characterized by the importance of fulfilling obligations to the family and in-group, placing group goals and interests over individual goals and interests, and maintaining harmony in social relationships (Oyserman et al., 2002; Leong et al., 2006; Schwartz et al., 2010). A meta-analysis by Oyserman et al. (2002) compared European Americans and Asian Americans in terms of their individualism and collectivism. They found that European Americans were higher in individualism and lower in collectivism than Asian Americans. Therefore, it makes sense to examine the effectiveness of individualistic and collectivistic cultural value appeals with European Americans and Asian Americans.

Hypotheses

As discussed earlier, cultural congruency effects suggest that persuasive health messages targeting recipients' cultural values would be more effective. Since evidence from studies showed that European Americans tend to place personal goals and desires over group goals and social welfare (Hofstede, 1984; Kim & Sherman, 2007; Markus & Kitayama, 1991; Oyserman et al., 2002; Triandis, 1995), they may be more responsive to messages about their own physical body and wellness and the personal consequences of health-related behaviors. In contrast, since

Asian Americans have been shown to emphasize social ties, mutual obligations, and place group goals over personal concerns (Hofstede, 1984; Markus & Kitayama, 1991; Triandis, 1995; Kim & Markus, 1999; Oyserman et al., 2002), they may be more persuaded by messages about one's group and their collective health and the relational consequences of health-related behaviors.

Additionally, drawing upon ELM (Petty & Cacioppo, 1981), the reason why cultural congruency effects may occur is that cultural value appeals tend to be perceived as more relevant and stimulate higher levels of message engagement and effortful processing (Hawkins et al., 2008; Kreuter & Wray, 2003; Rimer & Kreuter, 2006), which in turn can lead to intended persuasive outcomes. Therefore, the following hypotheses were presented.

Hypothesis 1: An individualistic versus collectivistic message frame will predict more (a) favorable attitudes and (b) behavioral intention to perform the recommended behavior, among European Americans.

Hypothesis 2: A collectivistic versus individualistic message frame will predict more (a) favorable attitudes and (b) behavioral intention to perform the recommended behavior, among Asian Americans.

Hypothesis 3: The effects of message frame on attitudes will be mediated by (a) message engagement and (b) perceived message relevance.

Hypothesis 4: The effects of message frame on behavioral intention will be mediated by (a) message engagement and (b) perceived message relevance.

However, as discussed earlier, despite some evidence of cultural congruency effects in health communication contexts, more studies had mixed findings (Chung & Ahn, 2013; Han & Jo, 2012; Lee & Park, 2012; Murray-Johnson et al., 2001), and some studies even reported cultural incongruency effects (Ko & Kim, 2010; Yu & Shen, 2013). It is speculated that

recipients may experience discomfortable feelings of dissonance and being challenged and threatened when their core cultural values are employed to advocate for a counter-attitudinal position. As such, recipients are likely to engage in defensive processing and counter-arguing, which renders cultural value appeals unsuccessful. Therefore, the following set of competing hypotheses are presented.

Hypothesis 5: A collectivistic versus individualistic message frame will predict more (a) favorable attitudes and (b) behavioral intention to perform the recommended behavior, among European Americans.

Hypothesis 6: An individualistic versus collectivistic message frame will predict more (a) favorable attitudes and (b) behavioral intention to perform the recommended behavior, among Asian Americans.

Hypothesis 7: The effects of message frame on attitudes will be mediated by counter-arguing.

Hypothesis 8: The effects of message frame on behavioral intention will be mediated by counter-arguing.

Context

To test these hypotheses, this study is situated in an ongoing health issue—the use of face masks during the COVID-19 pandemic. The COVID-19 pandemic has had significant socio-economic impacts around the world (see, e.g., Nicola et al., 2020). According to data from the Johns Hopkins University of Medicine, the United States has reported one of the largest outbreak with cruel death tolls.

Research showed that a large portion of the spread of COVID-19 occurs through airborne aerosols when infected individuals breathe, speak, cough, or sneeze (see, e.g., Anderson et al.,

2020; Morawska & Cao, 2020). Aerosols are tiny viral particles that can float in the air and remain infectious for hours. Different from traditional disease control measures such as physical distancing and hand washing, universal masking is designed to reduce aerosol transmissions. The growing scientific evidence supports the effectiveness of face masks in preventing airborne spread of COVID-19 (see, e.g., Brooks et al., 2020; Chu et al., 2020; Greenhalgh et al., 2020; Leung et al., 2020; Lyu & Wehby, 2020; Pleil et al., 2020; Prather et al., 2020; Verma et al., 2020).

Despite the health benefits of face masks during COVID-19, there has been great resistance to wearing masks in the United States (Beer, 2020; De Nova, 2020; Li, 2020). Wearing masks is not part of the cultural norm and is oftentimes associated with health stigma—a person wearing a mask is carrying infectious disease (Leung, 2020). Additionally, wearing masks is not only physically uncomfortable, but also a challenge to communication—covering the bottom half of one's face restricts people's ability to express and perceive emotions, especially positive emotions (Nestor et al., 2020). Furthermore, some people refuse to wear masks as a form of rebellion to authority. People think the government has intruded their personal freedom and liberty by mandating them to wear masks. Conspiracy theories have also associated face masks with government manipulation and even tyranny. These and other socio-political reasons have led to great resistance to wearing masks in the U.S.

Survey data collected between March 2020 and January 2021 by University of Southern California (Key, 2021) showed that only about half of Americans (51%) said they mostly or always wore a mask when in close contact with people outside their household, with White Americans the least likely (46%) to consistently wear a mask while doing so. While the vast majority of Americans wore masks for grocery shopping, only about 20% wore a mask most or

all of the time when they visited someone else's home or when they exercised outdoors. Additionally, only about half of Americans consistently wore a mask when they attended religious service (60%) or visited a bar or restaurant (53%).

Given this context, it is important to address this ongoing health issue. Situated in the COVID-19 pandemic, this study looks at if and how individualistic and collectivistic cultural value appeals can improve attitudes and behaviors related to the use of face masks among European Americans and Asian Americans.

METHOD

Participants

Participants (N = 418) were recruited from a paid subject pool through *Qualtrics*^{xm} Research Suite in October 2020. Among them, 205 participants self-identified as European Americans, and 213 participants self-identified as Asian Americans. Participants' age ranged from 18 to 86 years, with an average of 45 years (SD = 16.51). About half of the participants were female (50.6%). The average political orientation score is 4.16 (SD = 1.75) on a scale ranging from 1 (*very conservative*) to 7 (*very liberal*). More than half of the participants were married (58.0%), Christian (55.0%), and had an education level above bachelor's degree (59.6%). Participants came from 43 states across the United States, with the most from California (19.4%), New York (13.2%), Florida (6.9%), Texas (5.5%), Pennsylvania (4.2%), Illinois (4.0%), Georgia (3.2%), Ohio (3.0%), Indiana (2.7%), Michigan (2.7%), and Virginia (2.7%).

Design and Procedure

This study was a 2 (message frame: individualistic versus collectivistic) × 2 (audience ethnicity: European versus Asian American) between-subjects pretest-posttest quasi-experiment. Attitudes and behavioral intention were the outcomes of interest. The cell sizes were as follow: 97 European Americans saw an individualistic message, 108 European Americans saw a collectivistic message, 108 Asian Americans saw an individualistic message, and 105 Asian Americans saw a collectivistic message.

After obtaining informed consent, participants completed an online survey on *Qualtrics*. Participants first responded to demographic questions asking about their ethnicity, American citizenship, age, gender, political orientation, religion, marital status, education, and state of

residence. Participants who self-identified with an ethnicity other than European or Asian American, participants without American citizenship, and participants under 18 years of age were filtered out of the study. Next, participants answered questions about their attitudes toward wearing masks and current behaviors of wearing masks prior to message exposure. Participants also reported their perceived norms and efficacy of wearing masks. Then, participants were randomly assigned to view one of the posters. The posters feature a "Mask Up" campaign and had either an individualistic or collectivistic message frame. After viewing a poster for at least 20 seconds, participants reported their levels of message engagement, perceived relevance of the message, and their counter-arguing while viewing the message. Finally, participants indicated their attitudes toward wearing masks and future behavioral intention to wear masks after message exposure.

Stimuli

Two versions of a poster featuring a "Mask Up" campaign (see Appendix A) were created using *Canva* by the author. Images were attributed to resources from Freepik.com. Message frames were manipulated through both texts and pictures, following practices in previous research (see, e.g., Chung & Ahn, 2013; Han & Jo, 2012; Ko & Kim, 2010; Lee & Park, 2012; Murray-Johnson et al., 2001; Uskul & Oyserman, 2010; Yu & Shen, 2013).

To create an individualistic versus a collectivistic message frame, messages framed wearing a mask as an individual behavior (e.g., "Mask Up, I do" and "I wear a mask") versus a collective behavior (e.g., "Mask Up, Together" and "We wear a mask"). The individualistic message frame also emphasized that wearing a mask is for individual considerations (e.g., "my life" and "my health"), whereas the collectivistic message frame highlighted that wearing a mask is due to collective or group considerations (e.g., "our loved ones" and "our community").

Additionally, the individualistic message frame included pictures featuring individual persons wearing masks, whereas the collectivistic message frame included pictures showing a group of people or family wearing masks.

To control for confounds, both versions of the poster used the same template, presenting the same layout and design. Texts followed the same script, with necessary variations for the experimental manipulation. The posters had almost the same word count, with 80 and 81 words respectively. Readability indices of Flesch Reading Ease and Flesch-Kincaid Grade Level were approximately equal for the posters and suggested the texts on the posters are plain English and easy to understand for a 5th or 6th grader (Flesch, 1979). All posters included pictures that depict people representative of all racial groups.

A pretest of the stimuli was conducted with 131 undergraduate students from a large mid-western university. Participants were randomly assigned to view one of the posters, and then answered questions related to their perceptions of the message. Results suggested that people perceived the two posters to be equally comprehensible, t (129) = 1.08, p = .28, and have equal levels of visual attractiveness, t (129) = .40, p = .69. People found both posters pretty easy to read and understand (M = 6.31, SD = 0.86) and fairly attractive (M = 5.42, SD = 1.23) on 7-point scales.

Measurement

Confirmatory Factor Analysis (CFA; Hunter & Gerbing, 1982) using *R* derived a one-factor solution for each measurement scale before an average score was computed to represent each participant's standing on a certain variable. Listwise deletion was used in case of missing values. Complete scale items are presented in Appendix B, in the order of appearance in the questionnaire.

Outcome Variables

Attitudes Toward Wearing Masks. Four 7-point semantic differential scale items measured the extent to which participants thought wearing masks outside their own houses during COVID-19 is positive, wise, desirable, and beneficial. CFA indicated acceptable model fit [χ^2 (2) = 4.71, p = .10, *CFI* = .996, *RMSEA* = .057, *SRMR* = .015]. Cronbach's α = .85. This measure was administered prior to message exposure (M = 5.78, SD = 1.49) and after message exposure (M = 6.01, SD = 1.42). Higher scores on this scale meant more favorable attitudes toward wearing masks.

Behaviors/Behavioral Intention to Wear Masks. Eight 5-point Likert scale items formed an index for how much participants wear masks when they visit various public spaces including church/religious service, friend's/relative's house, gym/fitness studio, theater/museum, park/beach, on streets/roads, around my neighborhood/community block, and drive-thru service. These locations were selected because they lie in the grey area under mask mandates and survey data (Key, 2021) showed that people's behaviors of wearing masks vary at these locations. In contrast, for places such as grocery stores, public transportation, or hospitals, where mask mandates are stringent, people's behaviors lack variance (Key, 2021). Participants indicated their responses with 1 = *never*, 2 = *sometimes*, 3 = *about half the time*, 4 = *most of the time*, 5 = *always*, or NA = *I have not been to/do not plan to go to this place*. An average score was calculated for each participant. Higher scores on this index meant more behaviors/behavioral intention to wear masks. This measure was administered prior to message exposure (M = 3.57, SD = 1.32) and after message exposure (M = 3.90, SD = 1.29). In terms of participants' baseline behaviors, about half of the participants (53.2%) in this study reported that they wore masks

most of the time or always when they visited public spaces, with more Asian Americans (64.6%) than European Americans (40.8%) consistently doing so.

Mediating Variables

Message Engagement. Four 7-point semantic differential scale items adapted from Lee and Aaker (2004) measured the extent to which participants were involved, focused, paid attention, and read the message carefully. The wording of items was revised for the context of this study. CFA indicated acceptable model fit [χ^2 (2) = 9.14, p = .01, *CFI* = .984, *RMSEA* = .092, *SRMR* = .028]. Cronbach's α = .75. Higher scores on this scale meant higher levels of message engagement (M = 5.80, SD = 1.18).

Perceived Message Relevance. Four 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*) items adapted from Jensen et al. (2012) measured the extent to which participants perceived the message to be relevant, important, and applicable to themselves. The wording of items was revised for the context of this study. CFA indicated acceptable model fit [χ^2 (2) = 3.23, p = .20, *CFI* = .999, *RMSEA* = .038, *SRMR* = .004]. Cronbach's α = .96. Higher scores on this scale meant higher levels of perceived message relevance (M = 5.77, SD = 1.34).

Counter-arguing. Three 7-point Likert scale (1 = *not at all* to 7 = *very much so*) items from Silvia (2006) measured the extent to which participants criticized the message, thought of points that went against the message, and were skeptical of the message while viewing the message. Cronbach's α = .89. Higher scores on this scale meant higher levels of counter-arguing while viewing the message (M = 2.71, SD = 1.81).

Covariate Variables

Potential covariate variables measured in this study included perceived descriptive norm (i.e., perceptions that most people wear masks in public), injunctive norm (i.e., perceptions that

most people approve or disapprove of wearing masks in public), self-efficacy (perceived ability to wear masks in public), and response efficacy (perceived effectiveness of wearing masks to prevent COVID-19). These variables have been shown in previous studies to affect health attitudes and behaviors (see, e.g., Ajzen, 1988; Ajzen & Fishbein, 1980; Witte, 1992).

Descriptive Norm. Three 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*) items measured the extent to which participants perceived that most people are wearing masks in public during COVID-19. Cronbach's $\alpha = .80$. Higher scores on this scale meant higher levels of perceived descriptive norm ($M = 5.71$, $SD = 1.17$).

Injunctive Norm. Four 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*) items measured the extent to which participants perceived that most people approve of wearing masks in public during COVID-19. CFA indicated acceptable model fit [χ^2 (2) = 2.50, $p = .29$, *CFI* = .999, *RMSEA* = .024, *SRMR* = .008]. Cronbach's $\alpha = .89$. Higher scores on this scale meant higher levels of perceived injunctive norm ($M = 5.56$, $SD = 1.18$).

Self-efficacy. Four 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*) items measured the extent to which participants perceived that they had the ability to wear masks in public during COVID-19. CFA indicated acceptable model fit [χ^2 (2) = 4.03, $p = .13$, *CFI* = .998, *RMSEA* = .049, *SRMR* = .007]. Cronbach's $\alpha = .92$. Higher scores on this scale meant higher levels of perceived self-efficacy ($M = 6.13$, $SD = 1.27$).

Response Efficacy. Four 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*) items measured the extent to which participants perceived that wearing masks was effective to prevent COVID-19. CFA indicated acceptable model fit [χ^2 (2) = 2.23, $p = .33$, *CFI* = 1.00, *RMSEA* = .017, *SRMR* = .004]. Cronbach's $\alpha = .95$. Higher scores on this scale meant higher levels of perceived response efficacy ($M = 5.78$, $SD = 1.46$).

To determine the covariate variables to include in data analyses, following the guidelines by Tabachnick and Fidell (2012), Pearson's product moment correlations were examined (see Table 1). Perceptions of descriptive norm ($r = .44$, $p < .001$), injunctive norm ($r = .51$, $p < .001$), self-efficacy ($r = .70$, $p < .001$), and response efficacy ($r = .75$, $p < .001$) all had significant associations with the posttest measure of attitudes. Additionally, descriptive norm ($r = .34$, $p < .001$), injunctive norm ($r = .42$, $p < .001$), self-efficacy ($r = .59$, $p < .001$), and response efficacy ($r = .64$, $p < .001$) were significantly correlated with the pretest measure of attitudes. Given that pretest attitudes ($r = .78$, $p < .001$) had a larger correlation with the dependent variable, perceptions of norms and efficacy were not included as covariate variables for attitudes to preserve statistical power.

Similarly, perceptions of descriptive norm ($r = .29$, $p < .001$), injunctive norm ($r = .38$, $p < .001$), self-efficacy ($r = .44$, $p < .001$), and response efficacy ($r = .58$, $p < .001$) all had significant associations with the posttest measure of behavioral intention. Additionally, descriptive norm ($r = .22$, $p < .001$), injunctive norm ($r = .34$, $p < .001$), self-efficacy ($r = .38$, $p < .001$), and response efficacy ($r = .53$, $p < .001$) were significantly correlated with the pretest measure of behaviors. Given that pretest behaviors ($r = .83$, $p < .001$) had a larger correlation with the dependent variable, perceptions of norms and efficacy were not included as covariate variables for behavioral intention to preserve statistical power.

Therefore, only the variances in pretest measures of attitudes and behaviors were controlled for in subsequent data analyses.

RESULTS

Data were analyzed using *SPSS*. To examine the effects of individualistic versus collectivistic message frame on attitudes toward wearing masks (see Figure 3), a repeated-measures Analysis of Variance (ANOVA) was conducted, with message frame and audience ethnicity as between-subjects factors. Tests of between-subjects effects showed that Asian Americans had more favorable attitudes toward wearing masks than European Americans, F (1, 414) = 28.62, $p < .001$, regardless of which message frame they were exposed to. Tests of within-subjects effects showed that overall participants reported more favorable attitudes toward wearing masks after message exposure, F (1, 414) = 21.55, $p < .001$.

To take a closer look at the effects of individualistic versus collectivistic message frame on attitude change by audience ethnicity (see Table 2), paired sample t-tests were conducted. For European Americans, when exposed to an individualistic message frame, participants' attitudes at pretest (M = 5.40, SD = 1.61) and posttest (M = 5.53, SD = 1.55) did not differ significantly, t (96) = 1.49, p = .14. However, a collectivistic message frame caused a significant change in attitudes from pretest (M = 5.48, SD = 1.68) to posttest (M = 5.80, SD = 1.59) among European Americans, t (107) = 3.29, $p < .01$. Therefore, data were consistent with Hypothesis 5a but inconsistent with Hypothesis 1a.

As for Asian Americans, viewing an individualistic message frame resulted in significant attitude change, t (107) = 2.44, $p < .05$, from pretest (M = 6.14, SD = 1.05) to posttest (M = 6.38, SD = 1.08). Additionally, a collectivistic message frame was also effective in significantly changing attitudes among Asian Americans, t (104) = 2.03, $p < .05$, from pretest (M = 6.14, SD = 1.37) to posttest (M = 6.32, SD = 1.17). However, the effects of an individualistic and a collectivistic message frame on attitude change did not differ significantly for Asian Americans,

F (1, 211) = .20, p = .66. Therefore, data were inconsistent with either Hypothesis 2a or Hypothesis 6a.

To examine the effects of message frame on behavioral intention to wear masks (see Figure 4), a repeated-measures ANOVA was conducted, with message frame and audience ethnicity as between-subjects factors. Tests of between-subjects effects showed that Asian Americans had higher behavioral intention to wear masks than European Americans, F (1, 398) = 31.31, p < .001, no matter which message frame they were exposed to. Tests of within-subjects effects showed that overall participants' behavioral intention to wear masks increased after message exposure, F (1, 398) = 70.00, p < .001. Additionally, the observed behavioral change was different depending on ethnicity, F (1, 398) = 6.08, p < .005, and ethnicity by message frame, F (1, 398) = 9.14, p < .01.

To further probe the effects of message frames on behavioral intention by ethnicity (see Table 3), paired sample t-tests were conducted. For European Americans, an individualistic message frame did not result in significant behavioral change from pretest (M = 3.32, SD = 1.41) to posttest (M = 3.43, SD = 1.31), t (88) = 1.40, p = .17. However, when European Americans were exposed to a collectivistic message frame, they reported significantly higher behavioral intention to wear masks at posttest (M = 3.56, SD = 1.40) compared to pretest (M = 3.22, SD = 1.41), t (102) = 4.31, p < .001. Therefore, data were consistent with Hypothesis 5b but inconsistent with Hypothesis 1b.

When Asian Americans were exposed to an individualistic message frame, participants' behavioral intention increased significantly from pretest (M = 3.87, SD = 1.09) to posttest (M = 4.39, SD = 1.04), t (105) = 6.88, p < .001. Furthermore, a collectivistic message frame was also able to cause significant behavioral change among Asian Americans, t (103) = 4.21, p < .001,

from pretest (M = 3.83, SD = 1.25) to posttest (M = 4.13, SD = 1.17). Additionally, the effect of an individualistic message frame on behavioral change was significantly larger than that of a collectivistic message frame for Asian Americans, F (1, 208) = 4.50, $p < .05$. Therefore, data were consistent with Hypothesis 6b but inconsistent with Hypothesis 2b.

To investigate the mechanisms through which individualistic versus collectivistic message frame had effects on attitudes toward wearing masks, mediation analyses were conducted with *PROCESS* (Hayes, 2009) for European and Asian Americans respectively. Message frame was the independent variable, and it was dummy coded with the individualistic message frame as the reference condition. Posttest measure of attitudes was treated as the dependent variable, and pretest measure of attitudes was included as the covariate variable. Message engagement, perceived message relevance, and counter-arguing were tested as potential mediating variables. Regression models for the mediation analyses are presented in Table 4.

Results showed that there were no significant indirect effects of message frame on attitudes through any of the mediating variables, for either European Americans or Asian Americans. All of the indirect effects had bootstrapped 95% confidence intervals including zero. Therefore, data were inconsistent with both Hypothesis 3 and Hypothesis 7.

Similarly, mediation analyses were conducted for European and Asian Americans respectively to examine the mediating relationships between message frame and behavioral intention to wear masks. The mediation models included dummy coded message frame as the independent variable, posttest measure of behavioral intention as the dependent variable, pretest measure of behaviors as the covariate variable. The same set of mediating variables were tested. Regression models for the mediation analyses are presented in Table 5.

Results (see Figure 5) showed that for European Americans, perceived message relevance was a significant mediator. The indirect effect of message frame on behavioral intention to wear masks through perceived message relevance was .08, with a bootstrapped 95% confidence interval (.005, .17). Additionally, counter-arguing also significantly mediated the relationship between message frame and behavioral intention among European Americans. The indirect effect through counter-arguing was .05, with a bootstrapped 95% confidence interval (.004, .11). However, message engagement was not a significant mediator between message frame and behavioral intention for European Americans, as a bootstrapped 95% confidence interval around the indirect effect included zero. Therefore, data were inconsistent with Hypothesis 4a but consistent with Hypothesis 4b and Hypothesis 8 for European Americans.

As for Asian Americans, there were no significant indirect effects of message frame on behavioral intention to wear masks through any of the mediating variables. All of the indirect effects had bootstrapped 95% confidence intervals including zero. Therefore, data were inconsistent with either Hypothesis 4 or Hypothesis 8 for Asian Americans.

DISCUSSION

This study investigated the persuasive effects of individualistic and collectivistic message frames among European Americans and Asian Americans and explored the mechanisms through which cultural value appeals had impacts on attitudinal and behavioral outcomes. Results showed that for European Americans, a collectivistic message frame was effective in improving attitudes and behavioral intention, whereas an individualistic message frame did not result in significant attitudinal and behavioral change. For Asian Americans, both individualistic and collectivistic message frames predicted improved attitudes and behavioral intention, but an individualistic message frame led to greater behavioral change than a collectivistic message frame. While the mechanisms through which cultural value appeals had impacts on attitudinal and behavioral outcomes remained unclear for Asian Americans, perceived message relevance and counter-arguing were significant mediators explaining the effects of message frame on behavioral outcomes for European Americans. These findings had important theoretical and practical implications.

Theoretical and Practical Implications

Firstly, this study found that collectivistic rather than individualistic message frame was effective in changing attitudes and behaviors among European Americans. This is in line with previous research documenting cultural incongruency effects (Ko & Kim, 2010; Yu & Shen, 2013). This study further adds to this body of literature by offering a plausible explanation for the observed cultural incongruency effects. Mediation analyses indicated that compared to a collectivistic appeal, an individualistic appeal evoked more counter-arguing among European Americans, which in turn led to less behavioral intention. This suggests that when cultural values were employed to advocate for counter-attitudinal positions, recipients engaged in defensive

processing and counter-arguing as an attempt to minimize the dissonance resulted by the message. The consequence of counter-arguing was reduced persuasive effects of cultural value appeals.

The cultural incongruency effects identified in this study also point to the circumstances when cultural value appeals may be more or less appropriate to use and highlight the importance of gauging recipients' current attitudes before delivering persuasive messages. Drawing upon Social Judgment Theory (Sherif et al., 1965), people's attitude on an issue has three latitudes—latitude of acceptance is the range of ideas that people find reasonable or acceptable, latitude of rejection is the range of ideas that people see as unreasonable or objectionable, and latitude of noncommitment is the range of ideas that people think to be neither acceptable nor questionable. It is possible that when cultural value appeals are used to advocate for positions that fall within recipients' latitude of rejection, recipients are more likely to engage in counter-arguing, and thus result in unsuccessful persuasion. In this sense, cultural value appeals may be more suitable for persuasive messages that falls within recipients' latitude of acceptance or noncommitment. For instance, cultural value appeals may be less likely to trigger psychological reactance when persuading recipients to form new attitudes or to adopt new behaviors.

Additionally, in this study, perceived message relevance also mediated the effects of message frame on behavioral intention for European Americans. Results showed that a collectivistic appeal, compared to an individualistic appeal, was perceived to be more relevant, which further led to greater behavioral intention among European Americans. A collectivistic appeal also elicited higher levels of message engagement, such that European Americans paid close attention to and engaged in effortful processing of a collectivistic versus an individualistic appeal. However, these findings, despite of being significant, were inconsistent with the

aforementioned rationale arguing that perceived relevance and message engagement were reactions to culturally congruent messages (Hawkins et al., 2008; Kreuter & Wray, 2003; Rimer & Kreuter, 2006).

One possible explanation may be related to the health context under investigation in this study. Wearing masks not only benefits the individual, but also simultaneously protects others. The use of face masks to prevent the spread of an infectious disease may be intrinsically more of a collective effort and ask for the society/community as a whole to take actions together. If this is the case, European Americans in this study might perceive a collectivistic message frame to be more congruent with the nature of the advocated health behavior, and thus thought a collectivistic appeal to be more relevant and applicable and were more engaged in processing the message. To the extent that the health context of study influenced the observed outcomes, health communication practitioners should consider the nature of the recommended health behavior when applying cultural value appeals.

When it comes to the findings for Asian Americans, both individualistic and collectivistic message frames were effective in changing attitudes and behaviors. Asian Americans are thought to be more collectivistic and thus were predicted to be more responsive to collectivistic appeals, but this study suggests that Asian Americans were responsive to individualistic appeals as well. One possible explanation is related to the concept of collectivism. A key element of collectivism is contextual self (Markus & Kitayama, 1991; Oyserman et al., 2002; Triandis, 1995). People from collectivistic cultures may change their views of oneself according to the context or situation— "how I behave depends on who I am with, where I am, or both" (Oyserman et al., 2002, p. 9). Reading a message with an individualistic or collectivistic message frame may be a form of situational priming (Aaker & Lee, 2001) for Asian Americans in this study. As such, it is

possible that both individualistic and collectivistic appeals were compatible with Asian Americans.

Another plausible explanation is related to the acculturation of Asian Americans. Acculturation is a process of adaptation to the cultural values, attitudes, and practices of the dominant or prevalent culture (Berry, 1994; 2005). In the United States, the prevalent culture is largely European-based. Although Asian Americans are assumed to be more collectivistic, they may have also acquired individualistic cultural characteristics over time (see, e.g., Zhou, 2004). Scholars argue that individualism and collectivism are not opposites on a continuum, but rather two orthogonal concepts (see, e.g., Oyserman et al., 2002). It is possible that Asian Americans are high on both collectivism and individualism as they develop a bicultural identity (Berry et al., 1987) through acculturation processes. If this is the case, both individualistic and collectivistic appeals might be perceived as culturally congruent by Asian Americans, and thus both message frames were effective.

Limitations and Future Directions

Admittedly, this study has some limitations. To begin with, cultural value orientations of participants were not directly measured but assumed based on previous research of European and Asian Americans (Oyserman et al., 2002). However, the assumption may not be accurate for several reasons. First, the study by Oyserman et al. (2002) is not a very recent piece, and it is likely for the cultural orientation of a certain group to evolve and change over time. Second, even if the tendency documented in Oyserman et al. (2002) still applies today, the sample in this study may not be a good representation of the population. Additionally, Asian Americans oftentimes link their identities to specific countries of origin such as China, Korea, Japan, or Vietnam, and there are generational differences in terms of how Asian Americans perceive their identities (see,

e.g., Zhou, 2004). As a result, there may be more nuances in the assumed cultural value orientations. Future studies should consider measuring cultural orientations of participants directly (see, e.g., Jansen & Verstappen, 2014).

Another limitation is concerned with the specific health context of this study. As discussed earlier, people may perceive the use of face masks to prevent the spread of an infectious disease to be an intrinsically collective and prosocial action, so that a collectivistic message frame was thought to be more congruent with the nature of the recommended health behavior and more relevant and applicable in this context. The health issue of wearing masks may have unexpected interaction effects with the individualistic and collectivistic message frames. Furthermore, findings based on one specific health context may not be generalizable to other contexts where the key determinants of health outcomes may be different. Given these considerations, studies in the future are encouraged to explore individualistic and collectivistic value appeals and the mechanisms of their effects in other health contexts.

Finally, despite of the theoretical contributions, the practical significance of this study might be limited due to the health context under investigation. Ethnic minority groups in the U.S. have long been disproportionally affected by various health issues and experiencing health inequity. Cultural-sensitive health communication can help reduce health disparities to the extent that it makes messages equally understandable, meaningful, and effective to people from various ethnic cultural backgrounds (Betsch et al., 2016). However, the health context of this study may not be a particularly salient issue among Asian American communities, as Asian Americans in this study have demonstrated relatively high baseline levels of attitudes and behaviors. In this sense, the practical significance of this study is limited due to the chosen context. Future studies are encouraged to pay more attention to health issues that are of particular concern for various

ethnic groups. For instance, Asian Americans have disproportionally high rates of cervical cancer but the lowest rates of getting regular preventive gynecological exams (Keppel, 2007), due to culture-related perceptions and beliefs (see, e.g., Ho & Dinh, 2011). As such, research on cultural-sensitive health interventions aiming at increasing cervical cancer screening among Asian Americans would provide valuable practical implications.

CONCLUSION

This study investigated the effects of cultural value appeals in health persuasion. Situated in the ongoing COVID-19 pandemic, this study investigated the effects of individualistic and collectivistic message frames in fostering favorable attitudes toward wearing masks and increasing behavioral intention to wear masks among European and Asian Americans. The mechanism through which cultural value appeals had impacts on intended persuasive outcomes were also explored. Results showed that collectivistic versus individualistic appeals were more effective to improve attitudinal and behavioral outcomes for European Americans. For Asian Americans, both individualistic and collectivistic appeals predicted significant changes in attitudes and behavioral intention, but individualistic appeals resulted in greater behavioral change than collectivistic appeals. Additionally, while the mechanisms through which cultural value appeals had impacts on Asian Americans remained unclear, perceived message relevance and counter-arguing significantly mediated the effects of message frames on behavioral outcomes for European Americans. These findings had important implications for the theorizing and application of cultural value appeals in persuasive health communication.

APPENDICES

APPENDIX A: Experimental Stimuli

Figure 1. Individualistic Message Frame

Figure 2. Collectivistic Message Frame

APPENDIX B: Measurement Scales

Pretest Attitudes

In my opinion, I think wearing a mask anywhere outside my own house during COVID-19 is: (7-point semantic differential scale)

1. Positive——Negative (RC)
2. Foolish——Wise
3. Desirable——Undesirable (RC)
4. Beneficial——Useless (RC)

Pretest Behaviors

How often have you been wearing a mask (i.e., tightly covering your mouth & nose) when you visit the following places in the past month? (1 = *never* to 5 = *always*; NA = I have not been to this place in the past month)

1. Gym/fitness studio
2. Theater/museum
3. Church/religious service
4. Friend's/relative's house
5. Park/beach
6. On streets/roads
7. Around my neighborhood/community block
8. Drive-thru service

Normative perceptions

Descriptive norm (1 = *strongly disagree* to 7 = *strongly agree*)

1. It is common for people to wear a mask during COVID-19.

2. Most people wear a mask during COVID-19.
3. Wearing a mask is a usual thing to see during COVID-19.

Injunctive norm (1 = *strongly disagree* to 7 = *strongly agree*)

1. Most people think wearing a mask is the right thing to do during COVID-19.
2. Most people support wearing a mask during COVID-19.
3. Most people think we should wear a mask during COVID-19.
4. Wearing a mask during COVID-19 is endorsed by most people.

Efficacy

Self-Efficacy (1 = *strongly disagree* to 7 = *strongly agree*)

1. I am capable of wearing a mask if I go to public places.
2. I can wear a mask every time I leave my house.
3. I am able to wear a mask in public places.
4. Wearing a mask in public is an easy thing for me to do.

Response Efficacy (1 = *strongly disagree* to 7 = *strongly agree*)

1. Wearing a mask would keep me safe during COVID-19.
2. Wearing a mask is an effective protective measure during COVID-19.
3. Wearing a mask would help me stay healthy during COVID-19.
4. Wearing a mask is a useful practice to deal with COVID-19.

Message Engagement

While viewing the poster, I was: (7-point semantic differential scale)

1. Not at all involved——Very involved
2. Focused——Distracted (RC)
3. Skimmed it quickly——Read it carefully

4. Paid little attention——Paid a lot of attention

Perceived Relevance (1 = *strongly disagree* to 7 = *strongly agree*)

1. The poster said something important to me.
2. The information on the poster is very relevant to my situation.
3. The information on the poster is consistent with what I value in life.
4. The poster mentioned something applicable to me.

Counter-arguing (1 = *not at all* to 7 = *very much so*)

1. Did you criticize the poster you just saw while you were reading it?
2. Did you think of points that went against what was being said while you were reading the poster?
3. While reading the poster, were you skeptical of what was being said?

Posttest Attitudes

In my opinion, I think wearing a mask anywhere outside my own house during COVID-19 is: (7-point semantic differential scale)

1. Positive——Negative (RC)
2. Foolish——Wise
3. Desirable——Undesirable (RC)
4. Beneficial——Useless (RC)

Posttest Behavioral Intention

To what extent do you intend to wear a mask (i.e., tightly cover your mouth & nose) when you visit the following places in the next a few weeks? (1 = *never* to 5 = *always*; NA = I do not plan to go to this place in the following week)

1. Gym/fitness studio

2. Theater/museum
3. Church/religious service
4. Friend's/relative's house
5. Park/beach
6. On streets/roads
7. Around my neighborhood/community block
8. Drive-thru service

Table 1. Correlation Matrix and Descriptive Statistics for All Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Pre-Attitudes (1)	.85										
Pre-Behaviors (2)	.38**	--									
Descriptive Norm (3)	.34**	.22**	.80								
Injunctive Norm (4)	.42**	.34**	.71**	.89							
Self-efficacy (5)	.59**	.38**	.59**	.59**	.92						
Response Efficacy (6)	.64**	.53**	.46**	.63**	.74**	.95					
Engagement (7)	.44**	.28**	.34**	.33**	.41**	.43**	.75				
Relevance (8)	.61**	.44**	.49**	.54**	.69**	.76**	.57**	.96			
Counter-arguing (9)	-.42**	-.13*	-.12*	-.10	-.30**	-.26**	-.35**	-.29**	.89		
Post-Attitudes (10)	.78**	.44**	.44**	.51**	.70**	.75**	.52**	.69**	-.46**	.89	
Post-Behaviors (11)	.47**	.83**	.29**	.38**	.44**	.58**	.32**	.51**	-.23**	.53**	--
Mean (Overall)	5.78	3.57	5.71	5.56	6.13	5.78	5.80	5.77	2.71	6.01	3.90
(*SD*)	(1.49)	(1.32)	(1.17)	(1.18)	(1.27)	(1.46)	(1.18)	(1.34)	(1.81)	(1.42)	(1.29)

Note. $N = 402$. *$p < .05$. **$p < .001$. Reliabilities are in the diagonal. Except that behaviors were measured with a 5-point index, all other variables were measured on 7-point scales

Table 2. Attitudinal Outcomes by Message Frame and Audience Ethnicity

Ethnicity \ Message Frame		Individualistic	Collectivistic
European American	Pretest	5.40 (1.61)	5.48 (1.68)
	Posttest	5.53 (1.55)	5.80 (1.59)
Asian American	Pretest	6.14 (1.05)	6.14 (1.37)
	Posttest	6.38 (1.08)	6.32 (1.17)

Note. $N = 418$.

Table 3. Behavioral Outcomes by Message Frame and Audience Ethnicity

Ethnicity \ Message Frame		Individualistic	Collectivistic
European American	Pretest	3.32 (1.41)	3.22 (1.41)
	Posttest	3.43 (1.31)	3.56 (1.40)
Asian American	Pretest	3.87 (1.09)	3.83 (1.25)
	Posttest	4.39 (1.04)	4.13 (1.17)

Note. $N = 402$.

Table 4. Regression Models for Mediation Analyses on Attitudinal Outcomes by Audience Ethnicity

	European American ($N = 205$)				Asian American ($N = 213$)			
	(1)	(2)	(3)	Post-Attitudes	(1)	(2)	(3)	Post-Attitudes
Message Frame	.28	.30	-.44	.05	-.02	.11	-.03	-.10
Pre-Attitudes	.37***	.52***	-.42***	.56***	.29***	.57***	-.66***	.28***
Engagement (1)	--	--	--	-.10	--	--	--	.07
Relevance (2)	--	--	--	.29***	--	--	--	.36***
Counter-arguing (3)	--	--	--	-.09*	--	--	--	-.14**
F	33.91***	58.54***	19.35***	121.31***	12.70***	55.20***	27.71***	63.97***
R^2	.25	.37	.16	.75	.11	.34	.21	.61

Note. *$p < .05$. **$p < .01$. ***$p < .001$. Message frame was dummy coded (0 = individualistic, 1 = collectivistic). Coefficients were unstandardized.

Table 5. Regression Models for Mediation Analyses on Behavioral Outcomes by Audience Ethnicity

	European American ($N = 192$)				Asian American ($N = 210$)			
	(1)	(2)	(3)	Post-Behaviors	(1)	(2)	(3)	Post-Behaviors
Message Frame	.39*	.38**	-.58**	.11	.00	.13	-.04	-.24**
Pre-Behaviors	.30***	.53***	-.06	.72***	.16*	.30***	-.28**	.70***
Engagement (1)	--	--	--	-.05	--	--	--	-.01
Relevance (2)	--	--	--	.21***	--	--	--	.10*
Counter-arguing (3)	--	--	--	-.08**	--	--	--	-.04
F	14.11***	34.84***	2.56	128.52***	3.24*	10.33***	3.63*	74.26***
R^2	.13	.27	.03	.78	.03	.09	.03	.65

Note. *$p < .05$. **$p < .01$. ***$p < .001$. Message frame was dummy coded (0 = individualistic, 1 = collectivistic). Coefficients were unstandardized.

Figure 3. The Effects of Message Frame on Attitudes by Ethnicity

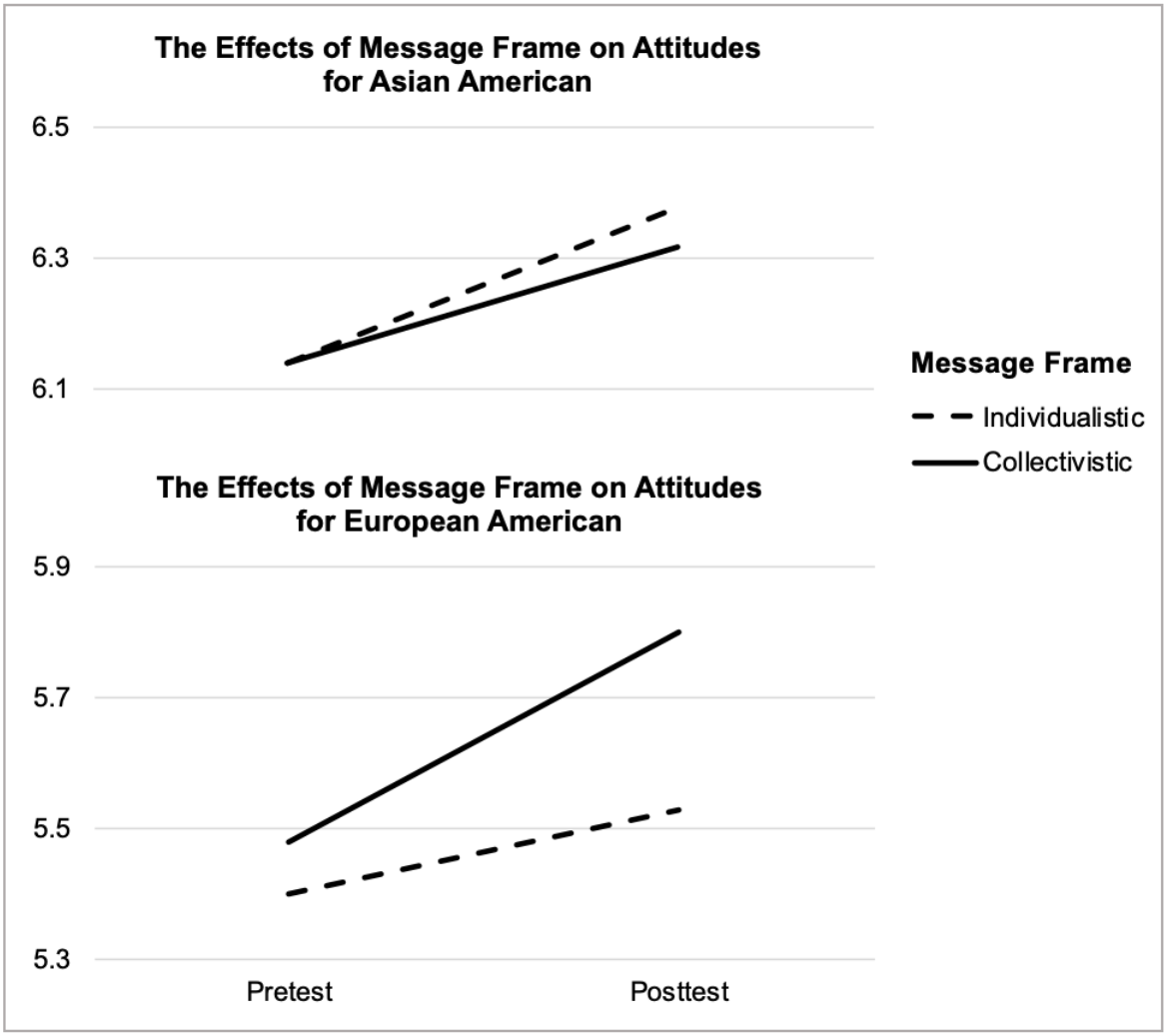


Figure 4. The Effects of Message Frame on Behaviors by Ethnicity

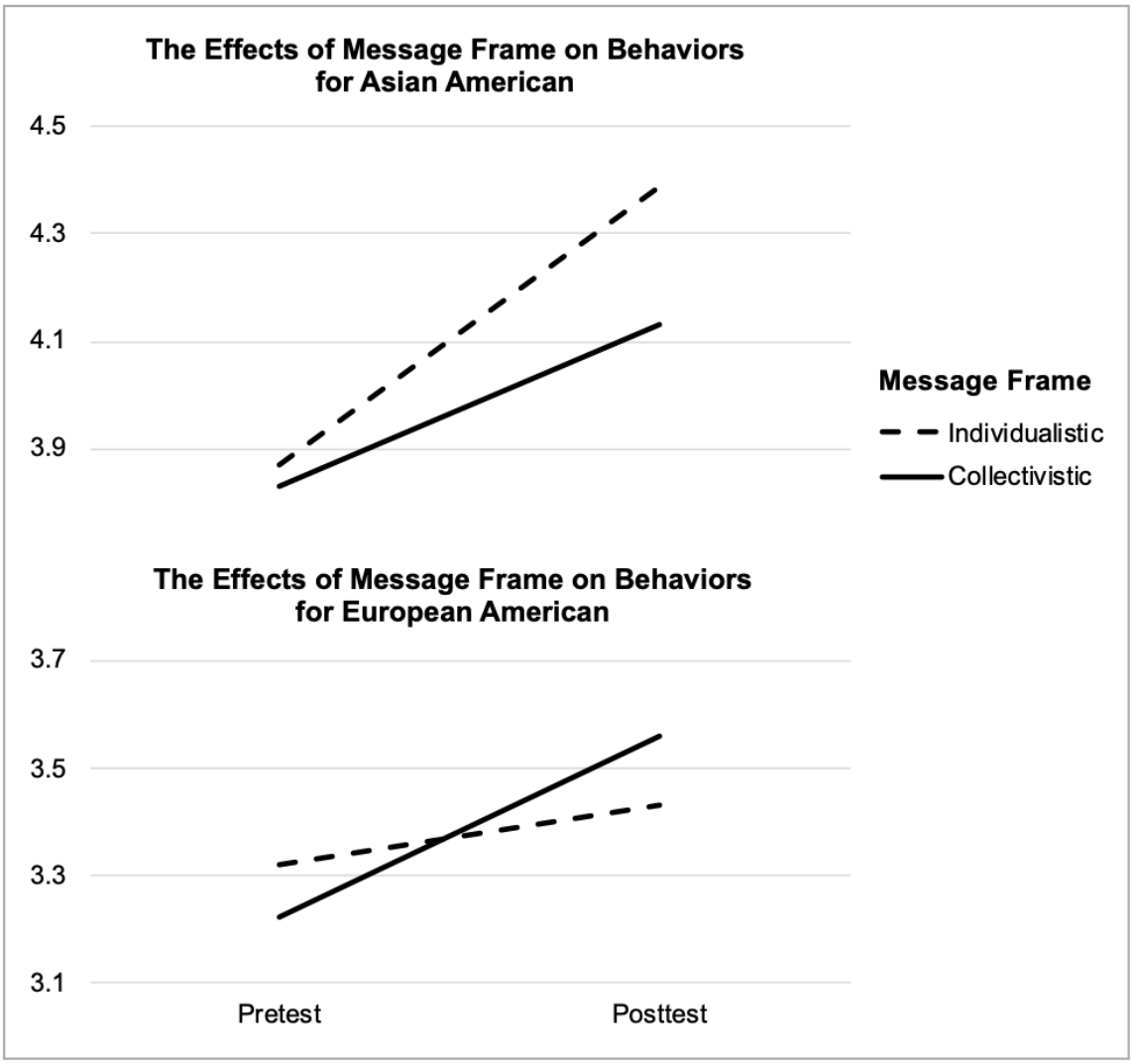
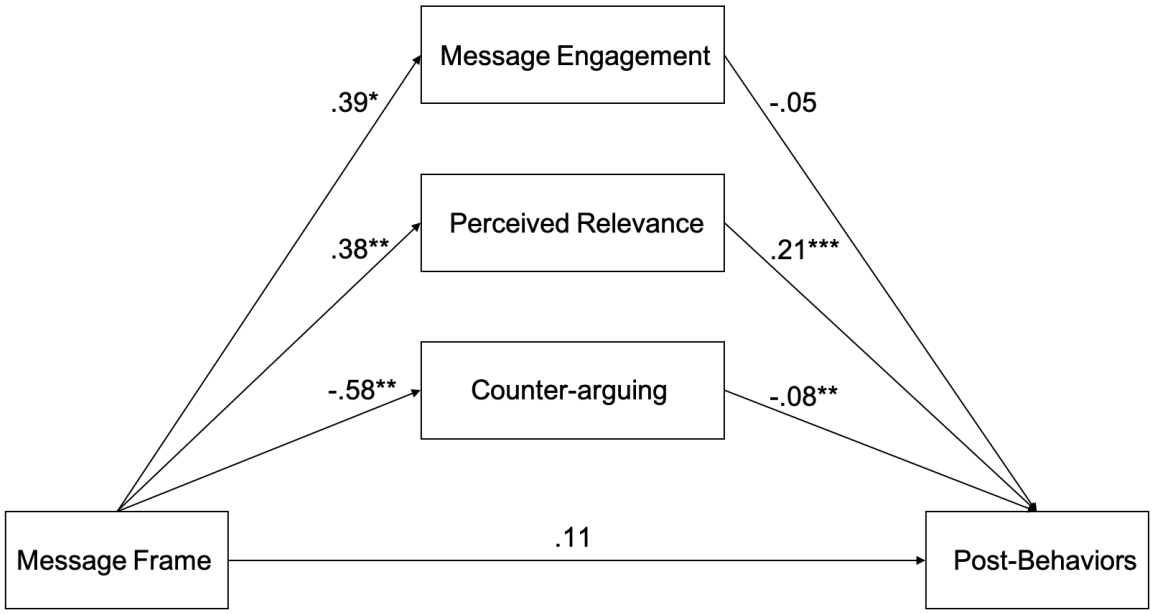


Figure 5. The Effects of Message Frame on Behavioral Intention Mediated by Perceived Message Relevance and Counter-arguing for European American



Note. N = 192. *p < .05. **p < .01. ***p < .001. Message Frame was dummy coded (0 = individualistic; 1 = collectivistic). Pre-Behaviors was included as a covariate. Coefficients were unstandardized.

Indirect effect through message engagement = -.02 (-.07, .02)

Indirect effect through perceived relevance = .08 (.005, .17)

Indirect effect through counter-arguing = .05 (.004, .11)

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