

## Message Persuasion in the Pandemic: U.S. and Chinese Respondents' Reactions to Mediating Mechanisms of Efficacy

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In the context of the COVID-19 pandemic, this study derives from construal level theory and integrates self-construal, temporal framing, and narrative strategies to test the interactions between these variables. Two experiments entailing two culturally sensitive variables—self-construal (interdependent vs. independent) and temporal framing (present vs. future oriented)—were conducted with some similar patterns identified between cultures: For one, narrative persuasion can successfully increase the matching effect of interdependent self-construal and present-oriented temporal framing on eliciting higher intentions of preventative behaviors; nonnarrative messages, on the other hand, are more effective to enhance the matching effect of independent self-construal and future-oriented temporal framing. The study also confirms the mediating role of self-efficacy. When “collective efficacy,” a multilayered mediator was added to the hypothesized model, it was found that Chinese participants attained collective efficacy at familial and national levels, whereas American participants’ behavioral intentions were mostly mediated by collective efficacy at familial and organizational levels. Theoretical and practical implications are discussed.

*Keywords: self-construal, temporal framing, narrative, self-efficacy, collective efficacy*

The pandemic of COVID-19 presents an unprecedented challenge for global health management (Cao et al., 2020; Sanders, Monogue, Jodlowski, & Cutrell, 2020). Public health communicators around the world strived to find the most persuasive message to mobilize preventative intention and behaviors. Historically, health communication scholars have cited the cultural significance of message tailoring in representation of the Cultural Sensitivity Approach to Health Communication to configure messages as

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health problems spread across cultural societies (Dutta, 2007). Despite numerous studies being conducted on message persuasion, scholars admit that most studies have been conducted in Western countries such as the United States and Europe (Muralidharan & Kim, 2019). There is a need for more cross-cultural and culturally sensitive studies that delve into health promotion strategies in underdeveloped and developing nations (Anderson, Heesterbeek, Klinkenberg, & Hollingsworth, 2020).

In response, this study compares effects of message tailoring in China and the United States, two culturally diverse countries; it facilitates understanding of message persuasion in countries with individuals mostly identified as having interdependent self-construal and countries with individuals more identified as having independent self-construal, respectively (Markus & Kitayama, 1991; Oyserman, Coon, & Kemmelmeier, 2002). Empirically, the study builds upon samples collected from the United States, the country with most cases of infection and death—hence, the new epicenter (Johns Hopkins Coronavirus Resource Center [JHCRC], 2020)—and China, the first country with reported cases of COVID-19. The timely data and nuanced investigation contribute to the understanding of intercultural health promotion amid this global challenge.

For nearly two decades, researchers have been concerned about whether narratives produce better persuasive effects than do nonnarratives, and whether there can be consistent persuasive effects of narratives across cultural groups (e.g., Greene & Brinn, 2003; Kim, Bigman, Leader, Lerman, & Cappella, 2012). However, previous research has not been able to find strong evidence for the advantage of narratives over nonnarratives (e.g., Murphy, Frank, Chatterjee, & Baezconde-Garbanati, 2013; Zebregs, van den Putte, Neijens, & de Graaf, 2015). Construal level theory (hereafter CLT) that focuses on the relationship between psychological distance and mental construal (Trope & Liberman, 2010) can provide an explanation for these mixed results. It is noted that the construal level may be not matched across message topics, designs, and processing styles in studies (Lee, 2019). For example, participants exposed to promotional messages of human papillomavirus (HPV) vaccine that paired with a distant temporal frame (high-level construal) and in a narrative (low-level construal) format were found to elicit lower vaccinating intentions than those exposed to messages that were framed distantly and in a nonnarrative format (high-level construal; Kim & Nan, 2016). Further explanation indicated that when the construal of a message design and a message receiver's processing style "fit," a consistent and fluent mental processing of the message is likely to occur, subsequently leading to increase in message persuasiveness and acceptance (Higgins, 2000; Lee, Keller, & Sternthal, 2010).

However, the application of this holistic research approach is still limited in cross-cultural health communication research. Some significant culture-related variables (e.g., self-construal) are rarely introduced into CLT research (Muralidharan & Kim, 2019). In the current study, the incorporation of self-construal and temporal framing, two typical message elements and culturally sensitive variables, into narrative persuasion echoes what Lee (2019) notes about CLT, that it "can guide a more holistic view of messages by offering insight into how a multitude of seemingly distinct message components may have underlying consistencies" (p. 320). Overall, our study fills in empirical gaps with three layers of implications. First, it draws theoretical support from CLT to investigate the persuasive effect of a comprehensive message framework for cross-cultural health promotion. Second, it uncovers the mediating roles of self-efficacy and

collective efficacy. Third, it goes a step further to outline the specific mediating effects of collective efficacy derived from different levels of groups such as families and communities.

### **Literature Review, Hypotheses, and Research Questions**

#### ***Linking Temporal- and Self-Construal to Narratives Through CLT***

The CLT can be understood as an approach to examine how people mentally process psychologically distant entities and realities. When entities and realities exist or occur in the distant future (temporal), in a distant location (spatial), and to individuals less like oneself (social), they are considered to be psychologically distant. Throughout prior research, a significant finding was that people thought about psychologically distant entities and realities with a broad and abstract mentality (high-level construal); on the other hand, psychologically proximal ones were processed at a concrete and detailed level (low-level construal; Trope & Liberman, 2010).

On the surface, the difference between temporal frame and self-construal is that the former belongs to the characteristics of the message itself, while the latter is related to the processing styles of the target audience. However, based on CLT, the “underlying consistencies” of the two constructs can illuminate how people mentally process psychologically distant entities and realities (Trope & Liberman, 2010). The temporal frame can be seen as a mental construal of the relationship between the self and time, and the self-construal can be seen as a mental construal of the relationship between the self and others. In the same vein, narratives, commonly seen as a traditional message format or message design strategy (Cappella, 2006), may trigger people’s low construal, because narratives are full of detailed, specific and vivid content compared with nonnarratives (Kim & Nan, 2016; Yan & Sengupta, 2013).

In sum, through CLT, we have concluded that the relationship among these three important health communication variables is often entangled: Interdependent versus independent self-construal can correspond to message receivers’ processing styles of low and high construal, respectively (Pounders, Lee, & Mackert, 2015; Spassova & Lee, 2013); narrative format (Chandran & Menon, 2004; Kim & Nan, 2016) and temporal framing (Kim & Nan, 2016; Yan & Sengupta, 2013) are two intertwined elements of message design that lead to different levels of construal. Connecting the three variables echoes the theoretical orientation of CLT that calls for integrating message processing factors and message design elements (Trope & Liberman, 2010). Although substantial research has been carried out to identify the relationship of two of the variables, the interactive effect of message design and message processing, as well as the interactive effect of different message design features remain obscure (Lee, 2019). Therefore, with China and the United States as representatives of cultural diversity, the first objective of the present study is to investigate the matching relationships of self-construal, narrative type, and temporal framing—three variables commonly theorized but constantly examined apart within the literature of message-oriented health promotion (Kim & Nan, 2016).

### ***Matching Temporal Framing and Self-Construal***

Trope and Liberman (2000) noted in CLT that perceived temporal distance could alter one's construal frameworks of public events, subsequently affecting the evaluating and decision-making process. More specifically, individuals' perceptions over proximal events were more contextualized; they often involved explanation based on more concrete and detailed discourse (hence low-level construal). In comparison, distant events were often explicated via more abstract and decontextualized discourse (hence high-level construal). Chandran and Menon (2004) noted that, when compared with the more distant "year" frame, the proximal frame based on "days" was more likely to generate concrete understanding of risk, thus eliciting more preventative behavioral intentions. Similar findings could also be found in research topics on healthy diet (Lo, Smith, Taylor, Good, & Von Wagner, 2012) and antismoking messages (Kim & Kim, 2018; Zhao & Peterson, 2017).

Yet effects of temporal framing were often contingent upon other factors. Previous research suggested that the persuasiveness of temporal framing depended on recipients' individual characteristics, such as their self-construal (Spassova & Lee, 2013). Self-construal referred to a "constellation of thoughts, feelings, and actions concerning one's relationship to others, and the self as distinct from others" (Singelis, 1994, p. 581). Individuals with independent self-construal, found among members of most Western cultural societies, tended to prioritize personal difference, self-interest, and personal goals; in contrast, individuals with interdependent self-construal, often found among members of eastern cultural societies, tended to put more emphasis on social belongingness, collective benefits, and harmony within the group (Markus & Kitayama, 1991; Oyserman et al., 2002). Yu and Shen (2013), for instance, discovered the moderating effect of cultural appeals for motivating behavioral intention of preventing influenza through an experiment conducted in the United States and Hong Kong. Lee, Goodall, Egbert, and Chung (2021) conducted an experiment with participants from the United States and South Korea in the context of smoking cessation and found that individuals with independent self-construal were more likely to be persuaded by self-reference fear appeals, whereas individuals with interdependent self-construal were more likely to be persuaded by other-reference fear appeals.

People who held independent self-construal were more likely to interpret behaviors or events through their abstract and internal nature such as psychological traits or attitudes (Pounders et al., 2015; Spassova & Lee, 2013). This was in line with the way people processed distant, future-oriented messages. In comparison, people who held interdependent self-construal often relied on specific and concrete information and relational background such as membership or social roles, and this was in line with the way people processed proximal, present-oriented messages (Liberman, Trope, McCrea, & Sherman, 2007; Spassova & Lee, 2013). Researchers noted that this matched message strategy could yield positive effect on individuals' message response and health-related behaviors (Chen, 2016; Spassova & Lee, 2013). For example, Pounders and colleagues (2015) found that the "year" frame was more effective to mobilize healthy behaviors among individuals of independent self-construal, while the "day" frame was more effective for individuals of interdependent self-construal. This means that a matching effect can be found between interdependent self-construal and messages with present-oriented temporal framing (hereafter PoTF) and between independent self-construal and messages with future-oriented temporal framing (hereafter FoTF). In line with such findings, the following hypothesis is put forward:

*H1: The matching between self-construal and temporal framing can affect preventative behavioral intentions. Stronger effects on preventative behavioral intentions can be noted when independent self-construal is matched with messages containing future-oriented temporal framing (FoTF) and when interdependent self-construal is matched with messages containing present-oriented temporal framing (PoTF).*

### ***The Moderating Role of Narrative Type***

Narrative persuasion has been long identified as an effective message strategy by health communication researchers. Narrative was defined as “a representation of connected events and characters that has an identifiable structure, is bounded in space and time, and contains implicit or explicit messages about the topic being addressed” (Kreuter et al., 2007, p. 222). When compared with “nonnarrative” (i.e., the type of information composed of didactic arguments or statistical evidence), narrative information was often seen as “a personal story, a description of an individual experience, or a personal opinion” (Braverman, 2008, p. 666).

According to CLT, narrative types were often linked to perceived temporal distance. Narrative with vivid and concrete details was in line with the way people processed proximal temporal oriented messages (Kim & Nan, 2016; Yan & Sengupta, 2013). Recently, the interactive effect of narrative types and temporal framing has begun to gain academic attention. Liu and Yang (2020), for instance, showed through an experiment of narrative versus nonnarrative persuasion related to e-cigarettes that participants perceived health threats to be temporally closer when reading narrative messages related to e-cigarette use, which subsequently influenced their attitudes and behavioral intentions. Kim and Nan (2019) also found that individuals tended to have more willingness to be vaccinated, and more understanding over the vaccine’s efficacy, upon receiving narrative information matched with PoTF; same outcomes were noted when participants were provided with nonnarrative information matched with FoTF.

In sum, narrative messages often resulted in low-level construal, which aligned with the construal level elicited by matching interdependent self-construal to PoTF; on the contrary, nonnarrative messages tended to be abstract and decontextualized and thus pointed to high-level construal, and this aligned with independent self-construal matched with FoTF. Therefore, based on CLT and the above evidence, we propose two optimal message strategy combinations (as shown in Table 1) and the following hypothesis:

*H2: Narrative type can moderate the matching effect of self-construal and temporal framing on individuals’ behavioral intention. Stronger effects on preventative behavioral intentions can be elicited when narrative information involves interdependent self-construal matched with a PoTF message and when nonnarrative information involves independent self-construal matched with an FoTF message.*

**Table 1. Two Proposed Optimal Combinations of Message Strategies Based on CLT.**

Construal Level	Message Design		Message Processing Style
	Temporal Framing	Narrative Type	Self-Construal
Concrete Thinking: Low Construal →	Present oriented	Narratives	Interdependent
Abstract Thinking: High Construal →	Future oriented	Nonnarratives	Independent

### ***The Mediating Role of Self-efficacy and Collective Efficacy***

Self-efficacy, theorized as people's beliefs in their capacity to enact a healthy behavior or terminate an unhealthy behavior (Bandura, 1977), was a central concept to health promotion. Research found that self-efficacy was an effective predictor of preventative behaviors during outbreaks of SARS (Cheng & Ng, 2006) and MERS (Jang & Park, 2018). Increasing amount of evidence suggested that self-efficacy was related to independent self-construal or FoTF. Cho, So, and Lee's (2009) study on smokers found that independent self-construal was positively correlated with self-efficacy; Nan and Qin (2019) found that FoTF was correlated with higher levels of self-efficacy in a sense that thoughts over future outcomes could considerably increase perceived self-efficacy, thus leading to more intention to quit smoking. However, it is unclear whether self-efficacy plays a mediating role when independent self-construal and FoTF are matched to reinforce individuals' intention of preventative behaviors. Thus, the following research question is put forward:

*RQ1: Will self-efficacy mediate the matching effect of self-construal and temporal framing on preventive behavioral intentions, especially when independent self-construal matched with FoTF?*

Facing health threat posed by pandemics such as COVID-19, most people tended to adjust their behaviors in accordance with the common reactions identified around their affiliated communities (Paluck, 2011; Portelinho & Elcheroth, 2016). This was in line with the theoretical conceptualization of collective efficacy—a belief that a group of people could successfully achieve a set goal and the perception that one could attain success via his or her affiliation to a larger group (Bandura, 2000; Gully, Incalcaterra, Joshi, & Beaubien, 2002).

Collective efficacy rested upon group affiliation and social belongingness. Individuals could self-categorize into groups of various levels, including family, community, and nation-state. The ranking of these affiliations and the resulted collective identities were largely differentiated by contexts (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) and affected by individual preference and degree of recognition (Walter, Demetriades, & Murphy, 2017). Collective group is not a singular or unified construct, yet little research has made the effort to specify and test respective effects of collective groups of different levels. A more recent study indicated that in the process of promoting preventative behavioral intentions to Chinese and Americans in the context of COVID-19, individuals' perception of social capital (e.g., trust and social network) went beyond the "self" to entail other affiliations including family (e.g., we can stay home and help stop the virus; Carpiano & Moore, 2020) and community (e.g., most of your neighbors

stay at home; Makridis & Wu, 2021). Drawing on this multilevel approach, this study exploratively specified collective efficacy at different levels ranging from “familial” to “national” and assessed the mediating pathways of each level.

Moreover, collective efficacy could be considered as a proxy for culture within a group setting, and culture is known for providing a source of identity for its members (Stahl, Maznevski, Voigt, & Jonsen, 2010). According to the cultural dimensions theory, Chinese culture tends to be more collectivistic, while American culture tends to be more individualistic (Hofstede & Bond, 1984). Earley’s (1994) cross-cultural study in the United States, Hong Kong, and mainland China found that people from collectivist cultures reported higher organizational collective efficacy. A recent survey study on COVID-19 response revealed that collective efficacy and political trust showed significant impact on Chinese people’s compliance with control measures; however, social trust, often noted in Western democracies as a significant impactor, did not have any effect among Chinese nationals (Wu, Wilkes, Fairbrother, & Giordano, 2020). Considering these findings, different levels of collective efficacy may have different mediating effects for the representatives of two different cultures: China and the United States.

*RQ2: What levels of collective efficacy (i.e., familial, community, organizational, province/state, national) will mediate the matching effect of self-construal and temporal framing on preventive behavioral intentions?*

*RQ3: Are the mediating pathways of collective efficacy different between the Chinese and the American participants?*

### **Experiment 1**

Experiment 1 was designed to test the matching effect of self-construal and temporal framing on preventative behavioral intentions.

### **Method**

#### *Participants*

From April 7 to April 11, 2020, a 2 (self-construal: interdependent vs. independent) by 2 (temporal framing: present vs. future oriented) online experiment was conducted in China. Consistent with previous study (Li & Zheng, 2020), participants were recruited and managed by a professional Chinese survey company, wenjuan.com, and the sample was drawn from an online panel of more than 8.9 million potential participants. Each participant who completed the questionnaire can receive a US\$2 reward. The survey was conducted in Chinese and approved by the university’s Institutional Review Board. Participants were randomly assigned to one of the four experimental conditions. A randomization check ensured that the experimental conditions did not significantly differ on background variables, including age, gender, and education. After excluding four invalid samples resulted from straight lining (i.e., a respondent chooses the same answer choice repeatedly), a total of 129 Chinese residents were included

in our final sample (55% female, 45% male; 75.2% in the age range of 18–29, 9.3% in the age range of 30–45, 15.5% above the age of 45).

### *Design and Procedure*

Upon given the link to the online experiment, participants were directed to sign the consent form. Participants were then shown an excerpt of news related to COVID-19. After reading the stimulus, participants were required to respond to a series of survey items, including those about their preventative behavioral intentions and demographic questions. It took each participant approximately 7–10 minutes to complete the session.

### *Stimuli*

Participants were shown an excerpt of news related to COVID-19 adapted from the official website of World Health Organization (WHO) and Centers for Disease Control and Prevention (CDC). Four versions of the news excerpt were created, and they had similar number of words (see Appendix A). To ensure that participants read through the content, the stimuli remained on the webpage for at least one minute.

### *Manipulation and Measures*

Unless indicated otherwise, 5-point Likert scales (1 = *strongly disagree*, 5 = *strongly agree*) were used to form an index for each construct.

Self-construal was manipulated by two operationalized survey items that were consistent with the approach commonly adopted by prior research: (1) pictures of individuals or families, and (2) text with highlights over the part that prompted readers to take actions to protect the body or family (Aaker & Lee, 2001; Pounders et al., 2015). Self-construal was measured via six items adapted from Singelis' (1994) study with three measuring independent self-construal ( $M = 3.69$ ,  $SD = .86$ ,  $\alpha = .83$ ) and another three assessing interdependent self-construal ( $M = 3.73$ ,  $SD = .66$ ,  $\alpha = .75$ ). An example item of independent self-construal was "My personal identity, independent of others, is very important to me." An example item of interdependent self-construal was "In general, groups I belong to are an important part of my self-image."

Temporal framing was manipulated following Chandran and Menon's (2004) study design. Given that this present study was conducted in the context of a more recent public emergency caused by COVID-19, the time unit was adjusted to "hour" and "month." Key information such as "every hour" versus "in the next month"; "the current task" versus "long-term task"; "take precautions immediately" versus "continue to take precautions in the future" were highlighted in the headlines and the main body of the article. The temporal framing was measured via two 7-point semantic differential scales (i.e., Now/Later, Today/Sometime in the future). The average score of the scales was entered as the index of temporal framing ( $M = 3.71$ ,  $SD = .97$ ,  $\alpha = .75$ ).

Preventative behavioral intentions were measured via seven items adapted from Liu, Fraustino, and Jin's (2016) study. Items included (1) "I would wash my hands or use hand sanitizer more often"; (2)



"I would wear a mask to reduce the risk of infection"; (3) "I would cover my mouth and nose with my bent elbow or tissue when I coughed or sneezed"; (4) "If any vaccine for COVID-19 is available, I will get myself vaccinated as soon as possible"; (5) "I would reduce contacts with friends"; (6) "I would avoid social gatherings"; (7) "If any vaccine for COVID-19 is available, I will recommend my friends or family members get vaccinated as soon as possible." The average score of these seven items was entered as the index of preventative behavioral intentions ( $M = 4.09$ ,  $SD = .32$ ,  $\alpha = .72$ ).

## Results

### Manipulation Check

A pair-samples  $t$  test suggested the effectiveness of manipulation over self-construal. Within the group that was exposed to the stimulus designed to activate interdependent self-construal ( $n = 65$ ), participants' index of interdependent self-construal ( $M = 3.93$ ,  $SD = .65$ ) was significantly higher than the index of independent self-construal ( $M = 3.44$ ,  $SD = .79$ ),  $t(64) = 4.16$ ,  $p < .001$ ,  $\eta^2 = .52$ ; within the group that was exposed to the stimulus designed to activate independent self-construal ( $n = 64$ ), participants' index of independent self-construal ( $M = 3.94$ ,  $SD = .87$ ) was significantly higher than the index of interdependent self-construal ( $M = 3.53$ ,  $SD = .60$ ),  $t(63) = 3.51$ ,  $p = .001 < .01$ ,  $\eta^2 = .44$ .

An independent-samples  $t$  test suggested that the manipulation over temporal framing was also effective. Under PoTF, participants' temporal index ( $M = 3.22$ ,  $SD = 1.81$ ) was significantly lower than the index derived from FoTF ( $M = 4.21$ ,  $SD = 2.01$ ),  $t(127) = -2.94$ ,  $p = .004 < .01$ ,  $\eta^2 = .52$ .

### Hypotheses Testing

H1 predicted that the matching of self-construal and temporal framing would affect preventative behavioral intentions. Results of an analysis of variance (ANOVA) suggested that although there was no significant main effect of self-construal,  $F(1, 125) = .04$ ,  $p = .836 > .05$ , and temporal framing,  $F(1, 125) = 1.97$ ,  $p = .163 > .05$ , the interactional effect between the two variables was significant,  $F(1, 125) = 16.33$ ,  $p < .001$ ,  $\eta^2 = .12$ .

Further simple main effects analysis suggested that for the condition of interdependent self-construal, PoTF ( $M = 4.15$ ,  $SE = .05$ ), when compared with FoTF ( $M = 4.01$ ,  $SE = .06$ ), had higher effect for increasing preventative behavioral intentions (marginally significant),  $F(1, 125) = 3.50$ ,  $p = .064$ ,  $\eta^2 = .03$ . As for the condition of independent self-construal, FoTF ( $M = 4.24$ ,  $SE = .05$ ), when compared with PoTF ( $M = 3.95$ ,  $SE = .06$ ), had a significantly higher possibility for increasing preventative behavioral intentions,  $F(1, 125) = 14.72$ ,  $p < .001$ ,  $\eta^2 = .11$ . Hence, H1 was supported.

## Experiment 2

The purpose of Experiment 2 was threefold. First, it examined the matching effect of temporal framing and self-construal found in Experiment 1 in the intercultural context. Next, it incorporated the contextual factors pertaining to intercultural health communication—narrative type—to uncover the

moderating effect of narrative type for the matching of self-construal and temporal framing. Lastly, it investigated the mediating effect of self-efficacy and collective efficacy. Based on existing scattered practices and limited literature in the health field, as an explorative study we categorized collective efficacy into five levels—familial, community, organizational, province/state, and national. In addition, Experiment 2 compared the intercultural difference among participants of the United States and those of China.

### ***Method***

#### *Participants and Procedure*

From April 22 to April 30, 2020, a 3 (matching type: matching interdependent and PoTF vs. matching independent and FoTF vs. mismatching) by 2 (narrative type: narrative vs. nonnarrative) between-groups online experiment was conducted in China and the United States.

Same as Experiment 1, the Chinese participants were recruited through wenjuan.com. The U.S. participants were recruited through e-mail or APP message push by the U.S. partners of the same survey firm, and compensation is made in the form of US\$2 in shopping coupons. After excluding three invalid samples that resulted from consecutive answering, a total of 245 participants who did not participate in Experiment 1 were included in the final sample (53.5% female, 46.5% male; 65.3% in the age range of 18–29, 15.5% in the age range of 30–45, 19.2% above the age of 45). Among them, 125 were from China and 120 were from the United States (including 26.9% White, 13.9% Asian, 4.5% Black, and 3.7% Hispanic). A randomization check ensured that groups did not significantly differ on important baseline variables, including age, gender, and education. The procedures of Experiment 2 were identical to Experiment 1. Since Experiment 2 involved more variables, it took each participant a longer time, about 15 minutes, to complete this session.

#### *Stimuli*

Like the stimuli used in Experiment 1, each participant was exposed to an excerpt of fictitious news about COVID-19. This time, the narrative type was manipulated. In line with Kim and Nan's (2019) findings, narrative information was manipulated to cite the story to a certain character—in our case, it was the self-narration of "an employee, Jack." Nonnarrative information did not mention a specific character and was filled with didactic statements (see Appendix A).

#### *Manipulation and Measures*

Besides measures used in Experiment 1, self-efficacy and five levels of collective efficacy were added, and each was measured by a 5-point Likert scale (see Table 2).

Narrative type was measured through one question. Considering prior research (Ma & Nan, 2019), participants were asked to respond "yes" or "no" to the question "Is this article using a personal statement?"

Self-efficacy was measured via four items adapted from Han, Zhang, Chu, and Shen's (2014) study. Items included (1) "I'm capable of taking care of myself"; (2) "I can avoid COVID-19 infection"; (3) "I can figure out how to avoid COVID-19 infection"; (4) "I'm confident that I can take effective preventive actions."

Collective efficacy at each level was measured via four items adapted from Paton's (2013) study. Example items for familial collective efficacy included (1) "My family can cope with COVID-19"; (2) "I'm confident that my family can stop the COVID-19 virus from spreading"; (3) "I'm confident that my family can effectively reduce risks and harm caused by COVID-19"; (4) "I'm confident that my family can take effective preventive actions."

#### Data Analyses

Through a series of ANOVAs, we examined the main and interactive effects of matching type and narrative type on the preventive behavioral intentions. The SPSS PROCESS macro (Hayes, 2017) was run to analyze the mediating effect. We used 95% bias-corrected bootstrap confidence intervals (CI) based on 5,000 bootstrap samples for statistical inference of indirect effects. Self-efficacy and five levels of collective efficacy were entered into Module 4 as parallel mediators.

**Table 2. Descriptive Statistics for Key Measures (Experiment 2).**

Measure	Items	<i>M</i>	<i>SD</i>	$\alpha$
Preventive behavioral intentions	7	4.21	.39	.71
Self-efficacy	4	4.07	.53	.76
Familial collective efficacy	4	4.07	.51	.76
Community collective efficacy	4	3.71	.77	.93
Organizational collective efficacy	4	3.96	.63	.87
Province/State collective efficacy	4	3.93	.86	.95
National collective efficacy	4	3.92	.87	.92
Independent self-construal	3	3.84	.78	.76
Interdependent self-construal	3	3.84	.70	.79
Temporal framing	2	3.42	1.82	.94

## Results

#### Manipulation Check

A pair-samples *t* test suggested the effectiveness of manipulation over interdependent self-construal,  $t(120) = -3.79, p < .001, \eta^2 = .034$ , and independent self-construal,  $t(123) = 3.11, p = .002 < .01, \eta^2 = .28$ . An independent-samples *t* test suggested the effectiveness of manipulation over temporal framing,  $t(243) = -21.12, p < .001, \eta^2 = .80$ . The chi-squared test confirmed the successful manipulation of the narrative type,  $\chi^2 = 175.01, p < .001, \eta^2 = .85$ .

*Hypotheses Testing and Research Questions*

H2 predicted that narrative type could moderate the matching effect of self-construal and temporal framing. Results of an ANOVA suggested that although the main effect of narrative type was not significant,  $F(1, 239) = 1.15, p = .285 > .05$ , the main effect of the matching of self-construal and temporal framing was significant,  $F(2, 239) = 3.94, p = .021 < .05, \eta^2 = .03$ . Specifically, when compared with mismatching ( $M = 4.15, SE = .03$ ), both matching interdependent self-construal and PoTF ( $M = 4.27, SE = .05$ ), and matching independent self-construal and FoTF ( $M = 4.29, SE = .05$ ) had significantly higher possibility for increasing preventative behavioral intentions. Hence, H1 was supported again in the cross-cultural context.

More importantly, narrative type and matching type significantly interacted,  $F(2, 239) = 8.55, p < .001, \eta^2 = .07$ . Further, simple main-effect analysis suggested that the matching of interdependent self-construal and PoTF in the stimulus that featured narrative information could significantly increase individuals' preventative behavioral intentions,  $F(1, 239) = 4.50, p = .035 < .05, \eta^2 = .02$ . On the other hand, featured nonnarrative information could significantly increase individuals' preventative behavioral intentions,  $F(1, 239) = 13.45, p < .001, \eta^2 = .05$ , when the independent self-construal and FoTF were matched in the stimulus. However, when self-construal and temporal framing did not match, there was no significant differences between narrative information and nonnarrative information for preventative intentions,  $F(1, 239) = .06, p = .812 > .05$ . Hence, H2 was supported (see Table 3).

To test the mediating effect of self-efficacy (RQ1) and five specific levels of collective efficacy (RQ2), we ran parallel multiple mediation analysis (Model 4) in the SPSS PROCESS macro. Given that the independent variable was a nominal variable with three levels, two dummy variables were set as the independent variables, matching independent self-construal and FoTF (0 = no, 1 = yes) and matching interdependent self-construal and PoTF (0 = no, 1 = yes). Six parallel mediating variables included self-efficacy and five levels of collective efficacy. Results indicated that, when independent self-construal was matched with FoTF (versus mismatching and matching interdependent and PoTF), only self-efficacy had significant mediating effect,  $b = .09, 95\% \text{ CI } [.05, .14]$ , and there was no direct effect noted,  $b = .05, 95\% \text{ CI } [-.04, .14]$ . This meant that the matching of independent self-construal with FoTF will increase self-efficacy, thus increase preventative behavioral intentions. For the indirect effect of interdependent self-construal matched with PoTF (versus mismatching and matching independent and FoTF) on preventative intentions, there was significant mediating effect of familial collective efficacy,  $b = .08, 95\% \text{ CI } [.04, .13]$ , organizational collective efficacy,  $b = .05, 95\% \text{ CI } [.01, .09]$ , and national collective efficacy,  $b = .02, 95\% \text{ CI } [.00, .06]$ . Details are shown in Table 4.

**Table 3. Means and Standard Errors Related to H2 (Experiment 2).**

Matching Type	Narrative Type	Intentions Mean (SE)
Matching interdependent self-construal and PoTF	Narrative	4.37 (.07) *
	Nonnarrative	4.17 (.07) *
Matching independent self-construal and FoTF	Narrative	4.11 (.07) ***
	Nonnarrative	4.47 (.07) ***
Mismatching	Narrative	4.14 (.05)
	Nonnarrative	4.15 (.05)

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

To compare the mediating paths of the Chinese and American cultural contexts (RQ3), we ran the sample from the two countries in PROCESS macro Model 4. Results indicated that, within the American sample ( $n = 120$ ), there were three significant mediating pathways to reinforce individuals' preventative intentions: when independent self-construal was matched with FoTF (versus mismatching and matching interdependent and PoTF), self-efficacy had significant mediating effect,  $b = .11$ , 95% CI [.05, .21]; when interdependent self-construal was matched with PoTF (versus mismatching and matching independent and FoTF), familial collective efficacy ( $b = .07$ , 95% CI [.01, .17]) and the organizational collective efficacy ( $b = .07$ , 95% CI [.00, .15]) had significant mediating effects.

**Table 4. Results of Mediation Model (Experiment 2).**

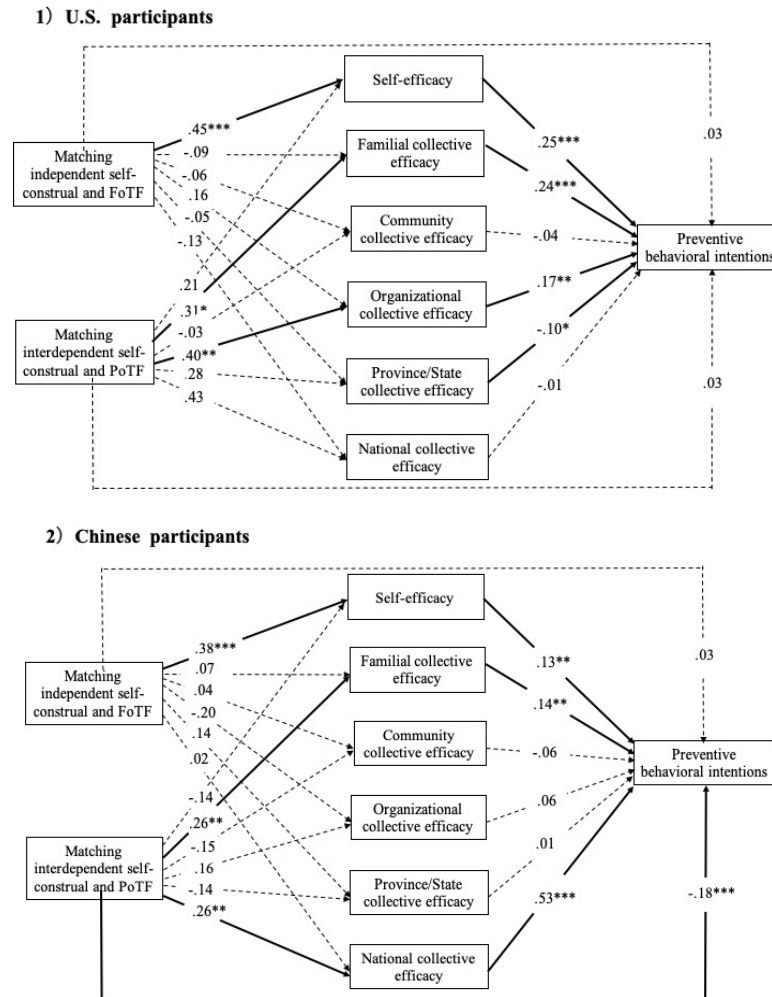
Independent and Dependent Variables	Mediation Variables	a <sup>a</sup>	b	Indirect Effect	Total Effect	Direct Effect
<b>IV:</b> Matching independent self-construal and FoTF (0 = no, 1 = yes)  <b>DV:</b> Preventive behavioral intentions $R^2 = .01$ , $F(1, 243) = 3.45$	Self-efficacy	.39 (.04) ***	.23 (.05) ***	.09(.02) [.05, .14]	.11 (.06)	.05 (.05)
	Familial collective efficacy	-.05 (.38)	.25 (.05) ***	-.01(.02) [-.05, .04]		
	Community collective efficacy	-.00 (.11)	-.07 (.03)	.00(.01) [-.02, .02]		
	Organizational collective efficacy	-.08 (.09)	.18 (.04) ***	-.01(.02) [-.05, .01]		
	Province/State collective efficacy	.00 (.13)	-.08 (.03) **	-.00(.01) [-.02, .02]		
	National collective efficacy	-.12 (.13)	.06 (.03) *	-.01(.01) [-.03, .01]		
	Self-efficacy	-.05 (.08)	.24 (.04) ***	-.01(.02) [-.06, .03]	.07 (.06)	-.06 (.05)
	Familial collective efficacy	.30 (.07) ***	.26 (.05) ***	.08(.02) [.04, .13]		
	Community collective efficacy	-.07 (.11)	-.08 (.03) *	.01(.01) [-.01, .03]		
	Organizational collective efficacy	.25 (.09) **	.18 (.04) ***	.05(.02) [.01, .09]		
<b>DV:</b> Preventive behavioral intentions $R^2 = .01$ , $F(1, 243) = 1.66$	Provincial/State collective efficacy	.09 (.13)	-.08 (.03) **	-.01(.01) [-.03, .01]		
	National collective efficacy	.39 (.13) **	.06 (.03) *	.02(.01) [.00, .06]		

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Cells contain the unstandardized regression coefficient with standard errors. For the indirect effect, bootstraps confident intervals are provided.

<sup>a</sup> The notations (a, b) refer to the paths in the module. The "a" paths are the effects of the independent variables on the mediating variables, and the "b" paths are the effects of the mediating variables on the dependent variables.

There were also three mediating paths for the Chinese sample ( $n = 125$ ). Similarly, when independent self-construal was matched with FoTF (versus mismatching and matching interdependent and

PoTF), self-efficacy had significant mediating effect,  $b = .04$ , 95% CI [.00, .09]; yet in contrast to the results yielded from the American sample, when interdependent self-construal was matched with PoTF (versus mismatching matching independent and FoTF), significant mediating effects were found for familial collective efficacy ( $b = .07$ , 95% CI [.02, .12]), and national collective efficacy ( $b = .17$ , 95% CI [.04, .34]). The mediating model of both samples was demonstrated in Figure 1.



**Figure 1. Mediating paths for U.S. and Chinese participants (Experiment 2).**

Note. Path coefficients are unstandardized coefficients. Solid lines indicate significant paths. Dashed lines indicate nonsignificant paths. Matching independent self-construal and FoTF: 0 = no, 1 = yes. Matching interdependent self-construal and PoTF: 0 = no, 1 = yes. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

### ***Discussion***

The COVID-19 pandemic broke out in the age of globalization and immigration/emigration. Both international health organizations and local health groups need to reconsider and implement their health intervention amid a diverse cultural public. To that end, more nuanced understanding of the matching effect of message design and message processing styles of different cultural groups can help generate more effective message strategy for intercultural health promotion in the pandemic. As a first step in this direction, we tested the persuasiveness of COVID-19 preventative message in China and the United States and then pursued to enhance its effectiveness in both countries by focusing on narratives that are culturally congruent with temporal framing and self-construal.

#### *Theoretical Implications*

First, this study provides new empirical evidence for CLT and expands its theoretical support to health communication research. CLT originally classified psychologically distant entities into four categories—temporal, spatial, social, and hypothetical (Lee, 2019). This research introduces narrative types (narrative vs. nonnarrative corresponding to high construal vs. low construal) into the model Experiment 2). Findings of this study corroborates Lee's (2019) statement that CLT can guide future research to explore optimal combinations of message design and other components, and to create message strategies by bringing in more than two message elements. The significant three-way interactions among self-construal, temporal framing, and narrative format also provide empirical evidence to support the speculation that when their construal levels line up, individuals will have smoother experience processing message (Lee et al., 2010; Liberman et al., 2007).

Second, the study extends the application of CLT in health communication by integrating self-efficacy and collective efficacy into the field. The results show that the mediating effects of these two constructs are indeed different. It is found that when independent self-construal was matched with FoTF, only self-efficacy has a significant mediating effect. However, when interdependent self-construal was matched with PoTF, only collective efficacy has a significant mediating effect (as shown in Table 4). This result shows that the different matching of message components will produce different mediating effects. Furthermore, translating psychological distance into message components—for example, the manipulation of spatial distance (i.e., hometown vs. a foreign country)—has been criticized as confounded with other constructs such as involvement and relevance (Trope & Liberman, 2010). In response, this study included self-efficacy and collective efficacy as mediators to provide alternative explanations of the relationship between psychological distance and construal level.

Third, this study unpacks the nuances of the mediating mechanism of collective efficacy (Bandura, 2000) by categorizing variables into five specific types—familial, community, organizational, province/state, and national. As the first step in this field, the multidimensional exploration of collective efficacy will help understand its different mechanisms for health promotion from a cross-cultural perspective.

*Practical Implications*

First, this study illuminates the matching effect of continuous vigilance and imminence with independent-oriented and interdependent-oriented values. Although previous literature has noticed and tested the matching effect of self-construal and temporal framing (e.g., Spassova & Lee, 2013), the current study shows the underlying consistency between self-construal, narrative, and temporal framing (see Table 1), to help health practitioners configure the most promising combination of elements of health messages during epidemics and pandemics—ultimately to promote public health behaviors.

Second, when collective efficacy is factored into the model, it is found that familial collective efficacy, organizational collective efficacy, and national collective efficacy can significantly mediate the matching effect of interdependent self-construal and PoTF. This means that for cultural groups held interdependent self-construal, embedding the benefit for the families, organizations, and the country in the messages rather than the self-centered appeal, might be a more promising strategy. However, for cultural group held independent self-construal, a more self-centered tailored message might increase intentional behaviors.

Third, when comparing the mediating paths of the American participants to the ones of the Chinese participants, results reveal similarities as well as differences. Both countries stress the role of self-efficacy for mediating the matching effect of independent self-construal and FoTF. This is consistent with the findings based on research over SARS (Cheng & Ng, 2006) and MERS (Jang & Park, 2018): Advocating for prolonged self-protection in postpandemic time can reinforce one's perceived self-efficacy, subsequently triggering self-protective behaviors. Similarly, familial collective efficacy is also found to mediate the matching effect of interdependent self-construal and PoTF among both American and Chinese participants. This is not hard to grasp. Given that people are asked to "stay at home" during the outbreak of COVID-19, the sense of belongingness that is provided by family becomes a placebo as people face the threat of virus (Kirk & Rifkin, 2020). This reminds communication practitioners in the public health domain to stress the impact of the pandemic on significant family members to increase the persuasiveness of disseminated messages. Family-centered messages might work for persuading both Chinese and American audiences.

However, American participants differ from Chinese participants for that the former tend to reinforce perceived collective efficacy derived from the organizations they belong to, such as their companies and schools, while Chinese counterparts tend to reinforce collective efficacy based on nation-state level—for instance, "protecting ourselves for the country." A possible explanation is that, under the outbreak of COVID-19 pandemic, the contractual culture (Tocqueville & Winthrop, 2000) that has long been at the center of American spirit means that members of the American cultural society tend to pay more attention to social groups related to professional development (Heppner, 2008). They are more susceptible to the insecurity caused by stagnant careers, or the difficulty associated with "working from home." Thus, in an objective to stimulate interdependent self-construal, heightening one's affiliation to his or her work unit can be a promising way to prompt individuals to adopt personal health behaviors. In contrast, China, as representative of collectivism culture, stresses harmony and belongingness. The collectivistic "We" identity carries a lot more weight than the individualistic "I" identity in the Chinese context (Yu & Shen, 2013; Zhu,



Anagondahalli, & Zhang, 2017). Thus, when interdependent self-construal is activated among the Chinese public, the faith in nation is triggered.

#### *Limitations and Future Directions*

This study has the following limitations. First, compared with data collection in a lab environment, participants of online studies can be easily distracted, which may result in entering errors. Future studies can repeat the study in more controlled lab environments. Second, the independent variable self-construal is activated by scenarios, and future research can adopt self-constructed measuring scales to measure self-construal. Third, this study lacks consideration of other psychological mechanisms such as social desirability factors. Future research can incorporate the implicit psychological mechanism to construct the model. Lastly, our study assesses intentions rather than actual behaviors. Although intentions can be strong predictors of actual behaviors (Kim & Hunter, 1993), we cannot track participants' actual behaviors upon reception of the stimuli. Future research can innovate more direct approaches to collect behavioral data.

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## Appendix A

**每小时，全球有大量的人  
受新冠肺炎 ( COVID-19 ) 影响**



据报道，在新冠肺炎确诊病例中，有轻度症状、严重疾病甚至死亡。目前还没有任何疫苗能够预防新冠肺炎。降低病毒感染或传播的建议包括：勤洗手、避免近距离接触、周围有其他人时用口罩蒙住口鼻、咳嗽及打喷嚏时掩住口鼻、清洁和消毒。

与新型冠状病毒的斗争是现在一项艰巨的任务，关系到我们每一个家庭的生命与健康。为了保护你的家庭，请立即采取适当的预防措施。

(1) Interdependent self-construal/  
present-oriented temporal  
framing

**未来一个月，全球或有大量的人  
受新冠肺炎 ( COVID-19 ) 影响**



据报道，在新冠肺炎确诊病例中，有轻度症状、严重疾病甚至死亡。目前还没有任何疫苗能够预防新冠肺炎。降低病毒感染或传播的建议包括：勤洗手、避免近距离接触、周围有其他人时用口罩蒙住口鼻、咳嗽及打喷嚏时掩住口鼻、清洁和消毒。

与新型冠状病毒的斗争是一项长期、艰巨的任务，关系到每一个个体的生命与健康。为了保护你的身体，未来请继续采取适当的预防措施。

(2) Independent self-construal/  
future-oriented temporal  
framing

**Figure 2. Experiment 1 stimuli (two examples).**

**每小时，全球有大量的人  
受新冠肺炎 ( COVID-19 ) 影响**



据报道，在新冠肺炎确诊比例中，有轻度症状、严重疾病甚至死亡。目前还没有任何疫苗能够预防新冠肺炎。降低病毒感染或传播的建议包括：勤洗手、避免近距离接触、周围有其他人时用口罩蒙住口鼻、咳嗽及打喷嚏时遮住口鼻、清洁和消毒。

“我知道和新型冠状病毒的斗争是现在一项艰巨的任务，关系到我们每一个家庭的生命与健康，”一位企业职员Jack说，“为了保护我的家庭，我会立即采取适当的预防措施。”

(1) Interdependent self-construal/  
present-oriented temporal framing/  
narrative information in Chinese

**Every hour, a significant number of people  
are affected by COVID-19 across the world.**



Reported illnesses have ranged from mild symptoms to severe illness and death for confirmed COVID-19 case. There is currently no vaccine to prevent COVID-19. Recommendations to reduce chances of being infected or spreading this virus include cleaning your hands often, avoiding close contact, covering your mouth and nose with a cloth face cover when around others, covering coughs and sneezes, cleaning and disinfecting.

“I know that the coronavirus struggle is now a difficult task that affects the lives and health of every family,” said Jack, an employee, “To protect my family, I’ll take appropriate precautions immediately.”

(2) Interdependent self-construal/  
present-oriented temporal framing/  
narrative information in English

**Figure 3. Experiment 2 stimuli (two examples).**