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Waiting for a Match: Mitigating Reactance in Prosocial Health Behavior Using Psychological Distance

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ABSTRACT

This study examined how psychological distance, both social and temporal, can be leveraged in prosocial health behavior messages to mitigate perceived psychological reactance. Following the construal level and psychological reactance theories, we conducted a 2 × 2 between-subjects factorial design ($N = 245$), which manipulated naturalistic messages regarding a prosocial communications campaign. Structural equation modeling showed that far temporal distance combined with far social distance could significantly reduce threat to freedom and therefore positively affect attitudes and behavioral intentions toward prosocial health topics. The effect of social distance was found not significant, differing from past findings. Further, intertwined and parallel psychological reactance models were tested and discussed. We suggest the need for more psychological reactance research, particularly examining prosocial health behavior. Strategies for practical persuasion strategies in prosocial messages are proposed.

Introduction

Every 9 minutes, a new patient is added to the approximately 109,000 others on the national transplant waiting list in the United States (Health Resources & Services Administration [HRSA], 2020). While seeking solutions to meet the large needs of organ donation and transplantation has always been an important task in health communication, the COVID-19 pandemic brings an immense challenge to this task. This is particularly true in countries suffering high infection rates, such as the United States and France, both reporting over 50% reductions in transplant activity (Loupy et al., 2020). One way to meet the immense needs of organ transplants is to increase the number of deceased and living donors. Regardless of consent rates, deceased organ donation has strict requirements regarding patient death in order to proceed in the process (Moorlock & Draper, 2018). Therefore, due to medical technology advances, living organ donations have become an effective source of transplantable organs to alleviate the shortage in supply from deceased organ donation (Browne & Desmond, 2008).

Living organ donation has been categorized in previous literature as a prosocial act (e.g., Guttman et al., 2016; Merz et al., 2017) because it inherently fulfills the definition through the intent to help others by donating (e.g., Balliet & Ferris, 2013). As living organ donation is a health topic, we define it as prosocial health behavior. Compared to typical prosocial behaviors, a prosocial health behavior is less likely to benefit one's personal physical health and sometimes even create discomfort, inconvenience, and potential risks for an individual. For example, living kidney donors may suffer a small increased risk of severe chronic kidney disease and end-stage kidney disease than healthy non-donors (Lentine et al., 2019). The lack of benefits and potential tax on one's physical health can make people hesitate to perform prosocial health behaviors compared to typical prosocial behaviors. Although some research shows the immediate risk of mortality related to living organ donation is very low (e.g., Segev et al., 2010), it is still riskier than not donating (Moorlock & Draper, 2018). Encouraging healthy people to take additional risks to donate is not optimal, though, from a medical perspective, it is a more successful alternative than deceased organ transplants. Thus, promoting living organ donations should only be done assuming significant medical efforts are being made in deceased organ donations to make the living organ donation unnecessary (Moorlock & Draper, 2018).

Psychological reactance theory (PRT) is commonly used in the context of persuasive health communication (Reynolds-Tylus, 2019) and is not scarce in organ donation literature (e.g., Quick et al., 2015b, 2011; Sukalla et al., 2017). Construal Level Theory (CLT) has increasingly contributed to the message effects research (Lee, 2019; Nan, 2007), and it is also present within organ donation studies (e.g., Wang & Zhao, 2018). To answer Quick et al.'s (2013) call for more theory-driven research on reactance-reducing message features, the current study, informed by CLT and current living organ donation practices, investigates how psychological distance (both social and temporal) can be adjusted in naturalistic messages to mitigate perceived reactance. Furthermore, this study also provides theoretical and practical implications concerning psychological reactance theory (PRT), along with prosocial behavior research and campaigns.

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Literature review

Psychological reactance

Psychological reactance stems from the Psychological Reactance Theory (PRT, Brehm, 1966) and assumes that humans cherish their freedom, choice, and autonomy. PRT posits that when freedom, choice, or autonomic behavior is threatened or eliminated, reactance will be activated, and individuals will be motivated to restore their threatened freedom (Brehm & Brehm, 1981). There are four components to PRT: freedom, threat to freedom, reactance, and restoration of freedom.

Freedom in PRT is "not abstract considerations, but concrete behavioral realities" (Brehm & Brehm, 1981, p. 12). These concrete behavioral realities include actions, emotions, and attitudes. Accordingly, the concept of freedom includes freedom to do, to feel, and to evaluate, or not to (Brehm, 1966; Quick et al., 2013). Anything that makes it more difficult for an individual to engage in free behavior, therefore, is called a threat to freedom (Brehm & Brehm, 1981). Threat to freedom can be perceived as threatening individuals' freedom to make their preferred decisions (R. L. Miller, 1976; Shen, 2014). When an individual's freedom is threatened, reactance occurs (Brehm & Brehm, 1981). Reactance is the "motivational state" (Brehm & Brehm, 1981, p. 37) that makes people act to reestablish their freedom (i.e., restoration of freedom) (Quick et al., 2013). To restore the freedom, individuals may engage in the forbidden behavior, increase favorable attitude to the threatened choice, derogate the source of threat, or gain different freedom to restore the feeling of control (Quick et al., 2013, for sample studies for each category).

PRT continues to be empirically tested and improved since it was initially introduced by Brehm (Steindl et al., 2015). Over the years, research has introduced several models operationalizing reactance as solely negative cognitions (single process cognitive model); solely anger (single process affective model); both anger and negative cognitions (dual-process model); anger as the proximal antecedent to negative cognitions (two-step linear process model); and anger and negative cognitions (intertwined model) (Reynolds-Tylus et al., 2020). While multiple models have been supported, studies spanning a vast range of topics have suggested that the intertwined model has the best fit (e.g., Clayton et al., 2019; Quick et al., 2015b). In addition to the growth of models presented within PRT research, there has also been modification and validation of the measurements used. Most recently, a discussion regarding how negative cognitions are measured has occurred. There are currently three popularly used PRT research measures, including participants listing and coding thoughts, trained coders categorizing participants' thoughts, and a Likert scale. Reynolds-Tylus et al. (2020) presented evidence that validated all three measures and suggested researchers should use research goals to guide which measurement is employed.

Mitigating reactance with message features

Freedom threat is conceptualized and tested as an antecedent to reactance (Brehm, 1966; Rains, 2013; Shen, 2014). The magnitude of reactance will increase when the number or proportion of freedom threats increases (Brehm & Brehm, 1981; Quick et al., 2013). Thus, to reduce reactance, it is necessary to control the proportion of threats to freedom. Considerable research has examined a variety of strategies to mitigate reactance by controlling threats to freedom. According to Quick et al. (2013), reactance-reducing can be achieved through adjusting specific message features, such as avoiding the use of domineering language (Dillard & Shen, 2005; Quick & Kim, 2009) and avoiding the demonstration of the intent to persuade (e.g., Campton, 2013; Wood & Quinn, 2003). Reactance-reducing can also be achieved through choice-enhancing postscripts, empathy, or using narratives (e.g., Bessarabova et al., 2017; Miller et al., 2007). For example, simply adding a choice-enhancing postscript at the end of a message has been shown to significantly reduce the perceived threat to freedom (Miller et al., 2007). On the other hand, Bessarabova et al. (2013, 2017) found a restoration postscript may only be beneficial at high-threat rather than low-threat conditions. In addition to adding a postscript after a persuasion message, adding an inoculation forewarning before a persuasive message also has the potential to reduce reactance (Richards et al., 2017). However, both restoration postscripts and inoculation forewarnings, although effectively reducing reactance in certain situations, may act as a refutational component to the main persuasion messages (Bessarabova et al., 2013, 2017) or bring extra inoculation threat (Richards et al., 2017), which may undermine the persuasive effect of health messages. Within the context of organ donation, Quick et al. (2015a) did not find a significant effect of a restoration postscript on reducing freedom threat. This finding brought an additional concern on the efficacy of postscripts, particularly regarding the organ donation topic. In the present study, instead of focusing on adding forewarnings or postscripts, we aim to adjust the features of a persuasive message itself. In other words, the present study seeks to test message features that can reduce reactance via enhancing the choice. The concrete message feature tested in this study is informed by CLT, which is reviewed in a later section.

Psychological reactance outcomes in the theory of reasoned action (TRA)

The Theory of Reasoned Action (TRA) suggests that an individual's intention or readiness to perform a behavior is formed by their "attitude toward the behavior, perceived norm, and perception of behavioral control" (Fishbein & Ajzen, 2011, p. 21). More specifically, attitudes are positively correlated with behavioral intentions (e.g., Sheeran et al., 1999). However, a study conducted by Dillard and Shen (2005) calls into question the replicability of this pattern. This study showed a theoretical sequence of attitude and behavioral intention only existed when examining flossing behavior but not drinking behavior. While the inconsistent results could occur due to the legality of underage drinking, Dillard and Shen (2005) inferred that these outcomes were produced due to different behavior types. According to the researchers, flossing is a reasoned, planful behavior generated by a corresponding attitude. On the other hand, drinking was hypothesized to not be a planful behavior because it can be influenced by social norms and commercial promotions of binge drinking. In the same vein, prosocial behavior can be considered a planful

behavior generated by attitudes but may also be caused by other forces, such as emotional reactions. Thus, it is unclear which path will be the most influential in a prosocial behavior context. However, this study considered that rational decision-making may still play a more critical role because living organ donation is a serious issue, which needs to be rationally processed. The first hypothesis, therefore, tests whether the theoretical sequence between attitude and behavioral intention can be established in a reactance model in the living organ donation case:

Hypothesis 1 (H1): Psychological reactance will be negatively related to favorable attitudes, which will, in turn, be negatively associated with desired behavioral intentions.

It is worth noting that the first part of H1 (i.e., the association between reactance and attitude) is to replicate previous findings in reactance research. This is done to ensure the linkage between reactance, attitude, and behavioral intention is valid in the living organ donation context before we further examine how message features influence reactance affecting attitude and behavioral intention.

Construal level theory

The construal-level theory (CLT) describes the relationship between psychological distance and individuals' way of thinking. CLT suggested that individuals think about psychologically distant events through an abstract way of thinking (i.e., high construal), whereas they consider psychologically proximal circumstances using a concrete way of thinking (i.e., low construal) (Trope & Liberman, 2010). In message effects research, a high-level construal, or abstract thought, is associated with messaging that contains psychologically distant events with the essential, abstract, and global features. In contrast, a low-level construal, or concrete thinking, is associated with messaging that contains psychologically near events with the peripheral, concrete, and local features (Trope & Liberman, 2010). For example, one will have a more specific and concrete plan for a vacation next week (proximal event), while a more broad and abstract idea about vacation next year (distant event). Different construal levels have been shown to impact various persuasive outcomes, including participants' self-efficacy, attitudes, and behavioral intentions toward prescribed events in the strategic messages (e.g., Lee, 2020; Nan, 2007).

When examining current organ donation campaign messages, one will find that organizations sometimes address messages specific to the audience (e.g., "*You* can donate a kidney . . . " from NHS Blood and Transplant, 2021), while sometimes to an unspecified public (e.g., "*Every organ donor* has the potential . . . " from Center for Organ Recovery & Education, 2021). Also, some messages encourage people to register "now" (e.g., "register now to become an organ and tissue donor" from HRSA, 2021a) or "today" (e.g., "register as an organ and tissue donor *today*" from NJ Sharing Network, 2021). In contrast, some messages encourage people without identifying any time frame (e.g., "Join us. Sign up" from HRSA, 2021b). From the perspective of CLT, these characteristics of messages used by health organizations may bring different persuasive effects. Hence, there is a need to examine the possible different effects caused by the different psychological distances emphasized in existing campaign messages to inform the future message design.

Construal levels in prosocial behavior and persuasion

Prosocial behavior occurs when an individual's actions benefit others at a cost to themselves (Henrich & Henrich, 2006). Providing benefits to others can make people "feel good" about themselves, whereas paying a cost, sometimes, is not that favorable. For example, most people feel enthusiastic when thinking about the idea of donating money, but the enthusiasm may substantially decrease when costs arise, so they may avoid a charity collector or avert the gaze from a beggar in the street (Aknin et al., 2015). Based on the paradoxical characteristic of prosocial behavior, researchers characterized prosocial actions by highly favorable abstract features and less favorable, sometimes unpleasant, concrete features (Aknin et al., 2015). Studies have shown individuals' favorable or unfavorable perceptions of a prosocial action are related to whether people construe the prosocial action at higher (abstract) or lower (concrete) levels (Aknin et al., 2015; Singh & Teoh, 2014). Research has also found individuals are more likely to appreciate the benefits of prosocial behavior when adopting high-level construals than low-level construals (Aknin et al., 2015). Beliefs about the benefits of prosocial behavior are essential because such beliefs guide decisions about engaging in prosocial actions (Gilbert & Wilson, 2000). Therefore, in the message to promote prosocial behavior in the current study, we suggest that communicators actively lead individuals to adopt high-level construals to enlarge the beliefs about the benefits of prosocial behavior.

According to CLT, psychologically distant events are interpreted at a more abstract level, emphasizing the central, deep, long-term meaning of events (Trope & Liberman, 2010). This effect makes it easier for people to appreciate and anticipate how their own efforts will help others, such as improving others' well-being (Aknin et al., 2015). In contrast, psychologically close events are construed at a more concrete level, emphasizing the concrete, contextual, short-term details of events, which increase the salience of personal costs involved in helping others. Thus, in a persuasive message design, highlighting the psychological remoteness of a prosocial action can lead individuals to adopt a higher-level construal of that prosocial action. In turn, this can guide individuals to appreciate the prosocial action's benefits and promote the prescribed action.

CLT in reducing psychological reactance

Possible mechanism. A possible mechanism proposed by Wicklund (1974) may explain why increasing the construal level (i.e., increasing psychological distance) can reduce the perceived threat to freedom to mitigate the psychological reactance (Katz et al., 2017). Wicklund (1974) posited that far distance indicates the requirement for action are lessened. That is, when the distance is greater, participants do not feel required to perform a particular behavior immediately, so their immediate freedoms are not threatened at that moment. Thus, they perceived less threat to freedom and thereby less

reactance. Katz et al. (2017) looked at reactance in the framework of construal level theory and proposed that, in general, abstraction and/or distance can mitigate the reactance. Another possible mechanism is related to the emotional intensity that connects to the construal levels. Research has shown that emotional feeling is related to close psychological distance and low construal level (Van Boven et al., 2010). Meaning, individuals with a lower-level construal can experience emotion more intensely and experience greater impact than those with a higher-level construal (Septianto & Pratiwi, 2016).

Through the lens of PRT, individuals with lower-level construals (associated with close psychological distance) may experience anger more intensely and, therefore, stronger psychological reactance. In contrast, individuals with a higher-level construal (at a far psychological distance) may experience less anger and less psychological reactance. The third possible mechanism is related to the relation between prosocial actions and construal levels. As mentioned above, individuals who adopt a high-level construal of a prosocial action are more likely to have positive beliefs about the prosocial action. The positive beliefs may weaken the potential negative beliefs brought by the psychological reactance. Therefore, individuals with a higher-level construal may experience less psychological reactance. All three mechanisms showed that individuals with low-level construals might experience greater psychological reactance than those with high-level construals.

According to CLT, psychological distance includes various dimensions, including temporal distance (e.g., near vs. distant future), social distance (e.g., self vs. other), spatial distance (e.g., here vs. somewhere else), and hypotheticality (e.g., real vs. imaginary) (Trope & Liberman, 2010). Considering that the present study is an initial investigation of the specific psychological distance in reactance, this study mainly focuses on two facets of psychological distance: temporal distance and social distance.

Temporal distance. Temporal distance maintains individuals adopt an abstract way of thinking (i.e., high-level construals) when thinking about a distant future event, whereas a concrete way of thinking (i.e., low-level construals) when considering a near-future event. The way of thinking will, in turn, influence individuals' perceived values and beliefs of the event (Stephan et al., 2011). People often have difficulty pursuing long-term benefits in the face of short-term costs because beneficial outcomes that seem temporally remote are often devalued relative to proximal adverse effects (Loewenstein & Thaler, 1989). For example, when individuals are asked to immediately decide to help others (e.g., signing up to be a living organ donor *right now*), they may adopt a concrete way of thinking and, in turn, perceive more costs rather than benefits about the prosocial decision. Moreover, asking individuals to make an immediate decision, particularly an unfavorable decision from a low-level construal, may threaten their freedom to make the decision later. Thus, it is likely to increase psychological reactance. In contrast, increasing the temporal distance of the event (e.g., signing up to be a living organ donor *anytime in the future*) can lead people to adopt an abstract way of thinking to perceive more benefits of the event while also providing freedom for individuals to make decisions anytime. Therefore, we propose a hypothesis regarding the analysis above.

Hypothesis 2 (H2): Psychological reactance will be lower when participants are processing a message emphasizing far (vs. close) temporal distance, such that increasing temporal distance will reduce freedom threat and therefore positively affect attitudes and behavioral intentions.

Social distance. CLT states that the less similar someone is to oneself, the more socially distant they typically seem (Stephan et al., 2011). Different construal levels to process the same information may be constructed depending on whether the information pertains to selves or others. As social distance decreases, information is mentally represented in more concrete, detailed, and contextualized terms (i.e., low-level construals). The above dynamics of temporal distance can be applied to the case of social distance. Increasing the perceived social distance of an event (e.g., the living organ donation issue pertains to others rather than self) can lead people to adopt an abstract way of thinking to perceive more benefits of the event and meanwhile perceive more freedom for individuals to make a choice unrelated to themselves. Therefore, a similar hypothesis regarding social distance is proposed.

Hypothesis 3 (H3): Psychological reactance will be lower when participants are processing a message that emphasizes far (vs. close) social distance, such that increasing social distance will reduce freedom threat and therefore positively affect attitudes and behavioral intentions.

Distance-on-distance effect. Past research has examined the different dimensions of psychological distance, but the effects of the various dimensions of distance have usually been investigated in isolation. Recent research on psychological distance has begun to explore the distant-on-distant effect. This is an effect where an event perceived close or far along one dimension of psychological distance (e.g., temporal distance) will be judged to be close or far along other dimensions (e.g., social distance) (Yan, 2014). The limited research on the combined effect has had inconsistent results. Huang et al. (2016) conducted a large-scale field study, and the results showed a "distance boosting" effect. That is, the effect of one dimension of psychological distance can increase the effect of the other. However, research also shows that the interaction effect may not always work in the same direction (Stamolampros & Korfiatis, 2018). Thus, the current study also intends to examine the combined effects of the two dimensions of distance. Although it is unclear how the combined effect of distance works on the reactance, it is likely that the interaction effect outperformed the single effect (Huang et al., 2016). Thus, a hypothesis on the combined effect of distance is proposed.

Hypothesis 4 (H4): The combined effects of social and temporal construal levels will outperform the effects of solo construal levels on outcome variables (i.e., attitude and behavioral intention). More specifically, increasing both social and temporal distance

will reduce freedom threat more than increasing solo distance and, therefore, positively affect attitudes and behavioral intentions.

Figure 1 illustrates the hypothesized framework for these proposed hypotheses.

Materials and methods

Participants and design

This study utilized a 2 (temporal distance: close vs. far) x 2 (social distance: close vs. far) between-subjects factorial design online experiment targeting adults living in the United States who were not registered as living organ donors.[1] Due to the target population's broad age level, Amazon Mechanical Turk (MTurk) was used to recruit 250 participants for this experiment. MTurk is a web-based crowd-sourcing platform widely used for social science research and shown to generate reliable and valid data (Paolacci & Chandler, 2014).

Sample overview

Participants whose responses were a straight line throughout the survey (e.g., all "7") were removed from analysis (n= 5), leaving a total analytic sample size of 245. There were approximately 60 participants in each of the four conditions. The average age of the sample was 38.16 (SD = 12.32), and there were more males (n= 147, 60%) than females (n= 96, 39.2%). Respondents were primarily White/Caucasian (n= 194, 79.2%), followed by Black/African American (n= 26, 10.6%), Asian (n= 16, 6.5%), and others (n= 9, 3.6%). For religious belief, the majority of the respondents were Christian (n= 91, 37.1%), followed by no religious belief (n= 77, 31.4%), Catholic (n= 66, 26.9%), and others (n= 11, 4.4%).

Materials and manipulations

Each participant was randomly assigned to one of the four conditions which contained identical information posts with keywords changed to manipulate construal levels. Many times, messaging used in experiments to induce reactance has only a slight resemblance to those seen outside of the laboratory (Vargas et al., 2017). The current research works to expand upon Quick et al.'s (2011) organ donation study by increasing ecological validity and ensuring elements of the experiment are consistent with the types of messages people encounter in everyday life, increasing external generalizability (Vargas et al., 2017). Previous studies that have used naturalistic messages opted not to employ the full PRT model and have only tested freedom threat (Kim et al., 2017). To overcome this research gap, message characteristics frequently employed by the US Department of Health and Science and the full PRT model were used.

Temporal distance

Temporal distance was manipulated by changing the participant's suggested time to sign up to become an organ donor. Participants assigned to the close condition received a message stating they should sign up to donate *now*. Participants who were in the far condition received a message stating they could sign up *anytime* to become a donor.[2]

Social distance

We manipulated social distance by changing the participant's proximity to the group referenced in the stimuli messages. Participants were randomly assigned to receive either a socially proximal or socially distant cue. Messages that were socially proximal used the term *you*, whereas socially distant messages referred to *anyone*.

Manipulation check or pilot testing

A separate MTurk sample (N = 69) was used for a pilot test to check the social distance and temporal distance manipulations. Both manipulations were successful. Participants who received "self" messages (n = 34, M = 3.0, SD = 1.41) perceived significantly more personal than participants who received "public" messages (n = 35, M = 3.77, SD = 1.19), $F(1,67) = 6.02$, $p = .02$, partial $\eta^2 = .08$. Participants who receive the "present" messages (n = 36, M = 2.08, SD = 1.16) perceived significantly less distant than participants who received "future" messages (n = 33, M = 3.39, SD = 1.41), $F(1,67) = 17.91$, $p < .001$, partial $\eta^2 = .21$.

Procedure

After participants read the informed consent script approved by the Institutional Review Board at a large research university in the US, they were told to read messages regarding organ

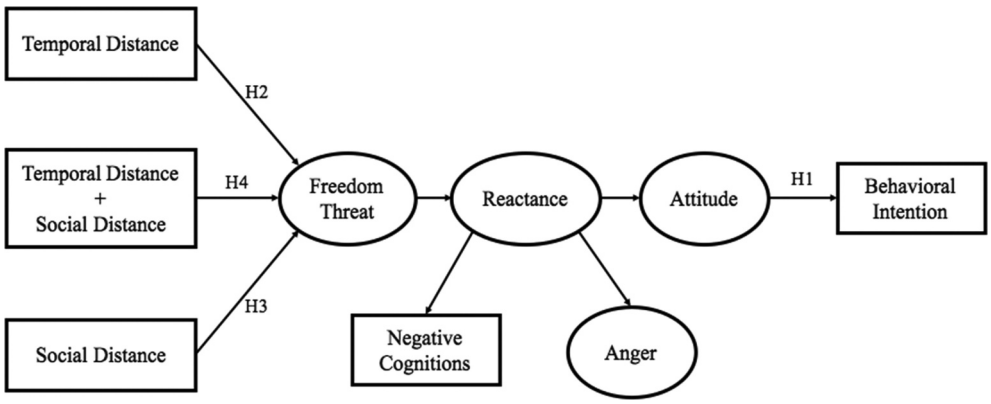

Figure 1. Hypothesized framework.

donations. Prior to the experiment, participants' trait reactance was measured. Participants were then randomly assigned to one of four manipulations. Following the stimulus presentation, participants completed dependent measures of the perceived threat to freedom, reactance, attitude, and behavior intention.

Measurements

Trait reactance

Trait reactance was measured using the 14-item Hong Psychological Reactance Scale (HPRS, Hong & Page, 1989). Participants rated these 14 items on a 7-point Likert scale from strongly disagree (1) to strongly agree (7). Sample items include: "I become angry when my freedom of choice is restricted," "I consider advice from others to be an intrusion," and "I resist the attempts of others to influence me." After inspecting the measurement model and revisiting the literature about this scale, seven items have been kept in the final measurement model and structural model to gain an adequate model fit. The methodological and theoretical rationale about the exclusion of other items has been explained in the endnote (Averaged scale: M = 3.81, SD = 1.54, α = .92).

Perceived threat to freedom

Perceived threat to freedom was measured using a four-item Likert scale (1 = strongly disagree, 7 = strongly agree) from Dillard and Shen (2005). The four items are "The message threatened my freedom to choose," "The message tried to make a decision for me," "The message tried to manipulate me," "The message tried to pressure me" (Averaged scale: M = 3.73, SD = 1.76, α = .87).

Reactance

In line with Dillard and Shen's (2005) reactance research, reactance is conceptualized as both cognition (i.e., counter-arguing) and affect (i.e., anger); thus, it was measured as a latent variable consisting of anger and negative cognitions.

Anger was measured using a four-item seven-point Likert scale (1 = none of this feeling, 7 = a great deal of this feeling) from Dillard and Shen (2005). The four items were, "To what extent did the message that you just read make you feel … angry/irritated/annoyed/aggravated" (Averaged scale: M = 2.69, SD = 1.91, α = .97).

Negative cognitions were measured using the thought-listing method, which has been validated by previous research (e.g., Rains, 2013). This study used two techniques to code negative thoughts. The first approach was the participant-as-coder technique (LaVoie et al., 2017). Specifically, participants were given 60 seconds to list at least five thoughts that came to mind after reading the messages regarding living organ donation. Next, participants were asked to evaluate each thought as relevant or irrelevant to the organ donation messages. Lastly, participants coded the valence (i.e., favorable/positive, neutral, or unfavorable/negative) for each of their own thoughts (Average of unfavorable/negative thoughts: M = 1.76, SD = 1.89, Range = 0– 10, N= 245). The second technique was using trained coders. Rather than using participants' self-coding value, we followed a similar process as a participant-as-coder did and manually coded participants' thoughts for negative cognitions (Average: M = .69, SD = 1.16, Range = 0– 6). After the training session, the coders independently coded 10% (N = 145) of thoughts on two variables: relevant/irrelevant (Cohen's Kappa = .91) and positive/neutral/negative (Cohen's Kappa = .76). There was a significant, moderate, and positive association between the negative cognition with these two coding procedures (r = .53, p< .001). Further reasoning behind two-way coding is explained in the results. Lastly, in line with previous research, only relevant unfavorable/negative thoughts were included in the data analysis (LaVoie et al., 2017; Quick, 2012).

Attitude

A five-item scale, developed from previous attitude scales (Dillard & Shen, 2005; Fishbein & Ajzen, 2011), was used to measure the attitudes. Participants were asked to rate the degree of their perception about living organ donation behavior on seven-point bipolar statements such as bad/good, foolish/wise, and harmful/ beneficial (Averaged scale: M = 5.67, SD = 1.20, α = .89).

Behavioral intention

Consistent with reactance research (Dillard & Shen, 2005), behavioral intention was measured by a 100-point, single-item estimate of the likelihood that participants would agree to be a living organ donor (Averaged scale: M = 50.98, SD = 30.79).

Results

The hypothesized model was tested using structural equation modeling (SEM) with the lavaan package (Rosseel, 2012) for R. All models were estimated using robust Maximum Likelihood (MLR) unless bootstrapping was employed, in which case ML estimation was adopted. Following Kline's (2015) two-step process, a measurement model was first fit to verify the factor structure of trait reactance, freedom threat, anger, and attitude toward living organ donation. Model fit for the measurement model was good based on the criteria from MacCallum et al. (1996) and Little (2013), $\chi^2(162) = 262.393$, $p < .001$, robust root mean square error of approximation (rRMSEA) = .058 (.045-.070), robust comparative fit index (rCFI) = .968, robust non-normed fit index/Tucker Lewis index (rNNFI/TLI) = .962, standardized root mean residual (SRMR) = .056.[3,4]

Consistent with contemporary practice in psychological reactance research (Dillard & Shen, 2005), a structural model was fit in which anger and negative cognitions were specified to load on a latent psychological reactance variable. Attitude toward living organ donation was regressed on psychological reactance, which in turn was regressed on freedom threat. Behavioral intention was then regressed on attitude. All variables in the model were regressed on the control variable, trait reactance, to get the true effects of the independent variables. However, contrary to past research on the measurement of psychological reactance, anger and negative cognitions did not load on a single factor. The loading for anger was .89 (p = .08) and, for negative cognitions, −.14 (p = .03). A follow-up test revealed that negative cognitions and anger were not

correlated ($r = -.10$, $p = .13$). To confirm that this relationship was a product of the content of the cognitions rather than the way respondents coded their own responses, two authors of this paper manually coded responses for negative cognitions. The recoded negative cognition variable and anger also failed to load on the latent psychological reactance factor (loading for negative cognition = .02, $p = .84$; loading for anger = .92, $p = .10$), as this recoded cognition variable was uncorrelated with anger ($r = .01$, $p = .83$). This way, we confirmed that respondents' coding did not cause the unexpected relationship between anger and negative cognitions; therefore, we continued using participants' self-coding negative cognitions in the following data analyses. Given the absence of a relationship between negative cognitions and anger, we specified one of Dillard and Shen's (2005) alternative models, that anger and negative cognitions are parallel processes of psychological reactance. Using the same criteria as above, this model fit was not adequate. Modification indices suggested correlating anger and behavioral intention, and negative cognitions and behavioral intention would significantly decrease the model's chi-square score. We revisited studies about psychological reactance and found some studies indeed showed psychological reactance could directly impact behavioral intentions (e.g., LaVail et al., 2010), and negative cognitions and anger components of reactance also directly influence the behavioral intention, respectively (e.g., Youn & Kim, 2019). Therefore, we decided to add the two regressions – regressing behavioral intention on both negative cognitions and anger. The final model achieved adequate model fit based on the same criteria as above, $\chi^2(197) = 334.653$, $p < .001$, rRMSEA = .060 (.049 – .071), rCFI = .959, rNNFI/TLI = .952, SRMR = .062. Consistent with psychological reactance theory, freedom threat was associated with more negative cognitions ($B = .31$, $se = .12$, $p = .01$) and more anger ($B = .87$, $se = .13$, $p < .001$). Table A1 in Appendix presents the correlation matrix of all measured variables in the structural model.

To test the hypotheses, the model described above was fit with dummy variables for the three out of four conditions with the reference condition being set to the stimuli with either close temporal/close social distance condition (Model #1) or far temporal/far social distance condition (Model #2). We used two different reference conditions to fit the two models because this way allowed us to see results for more pairs of group comparisons. The model fit was adequate for both models, $\chi^2(260) = 414.076$, $p < .001$, rRMSEA = .054 (.044 – .063), rCFI = .957, rNNFI/TLI = .951, SRMR = .062[5].

Hypotheses tests

The first hypothesis predicted that those higher in psychological reactance would have more negative attitudes and, therefore, lower behavioral intentions. Consistent with this hypothesis, anger was associated with more negative attitudes ($B = -.24$, $se = .08$, $p = .002$), as were negative cognitions ($B = -.18$, $se = .09$, $p = .048$). Further, higher positive attitudes were also associated with greater behavioral intentions ($B = 13.03$, $se = 1.69$, $p < .001$). There was a significant indirect effect of freedom threat on behavioral intentions through the influence of anger on attitude, as evidenced by a 5000 bootstrapped confidence interval that did not contain zero (CI = −2.63, −.50). These results are consistent with H1, except that negative cognitions operated independently of psychological reactance.

The second hypothesis predicted that far (vs. close) temporal distance would reduce freedom threat and therefore positively affect attitudes and behavioral intentions toward living organ donation. Model #1 results showed that, compared to the condition with close temporal and close social distance, the condition with far temporal and close social distance did not significantly reduce freedom threat ($B = -.22$, $se = .18$, $p = .21$). Model #2 results showed that, compared to the condition with far temporal and far social distance, the condition with close temporal and far social distance significantly increased freedom threat ($B = .44$, $se = .21$, $p = .04$). Model #1 and Model #2 together indicate that when keeping social distance on the close level, the far or close temporal distance did not exert a significant difference in reducing freedom threat. However, when keeping social distance on the far level, far temporal distance significantly reduced freedom threat as H2 predicted. The indirect effect of the condition with close temporal and far social distance tested in Model #2 made attitudes more negative (CI = −.17, −.002) and therefore reduced behavioral intentions (CI = −2.01, −.03). In other words, when keeping social distance on the far level, far temporal distance significantly reduced freedom threat and therefore positively affected attitudes and behavioral intentions. Thus, H2 was supported when social distance was kept far.

The third hypothesis predicted that far social distance would reduce freedom threat and therefore positively affect attitudes and behavioral intentions toward living organ donation. Model #1 results showed that, compared to the condition with close temporal and close social distance, the condition with close temporal and far social distance did not significantly reduce freedom threat ($B = -.10$, $se = .19$, $p = .58$). Model #2 results showed that, compared to the condition with far temporal and far social distance, the condition with far temporal and close social distance also did not significantly increase freedom threat ($B = .32$, $se = .20$, $p = .11$). Model #1 and Model #2 together indicated that social distance did not significantly reduce freedom threat regardless of if it was in temporally close or far condition. Thus, H3 was not supported.

The fourth hypothesis predicted a combined effect of social and temporal distance would outperform solo construal effects. Both Model #1 and Model #2 results showed, compared to the condition with both close temporal and close social distance, the condition with both far temporal and far social distance significantly reduced freedom threat ($B = -.54$, $se = .21$, $p = .008$). The indirect effect of temporal and social remoteness on attitudes through psychological reactance was also significant (CI = .02, .19) and increased behavioral intentions as a result (CI = .20, 2.28). Also, as reported in H1, Model #2 results showed the condition with both far temporal and far social distance significantly reduced freedom threat, compared to the condition with close temporal and far social distance. To sum up, the combination of both far temporal and far social distance resulted in greater effects than that of far temporal distance alone. This is consistent with H4.

Though not hypothesized, negative cognitions had a direct negative effect on behavioral intentions ($B = -6.48$, $se = 1.44$, $p < .001$). The final model is presented in Figure 2.

Discussion

This study examined how psychological distance (i.e., social and temporal distance) could be used to mitigate psychological reactance in regard to the persuasive messages about living organ donations. Findings suggested that far temporal distance combined with far social distance could significantly reduce freedom threat, which, in turn, positively affect attitudes and behavioral intentions, compared to close temporal distance combined with close social distance. Specifically, when keeping social distance remote, far temporal distance could reduce freedom threats and, therefore, positively affect attitudes and behavioral intentions, compared to close temporal distance. However, when keeping temporal distance consistent, far social distance did not significantly affect freedom threat. The theoretical and pragmatic implications, limitations, and future directions of this study are discussed below.

First, the theoretical linkage between attitudes and behavioral intentions was well-supported in this living organ donation study. This means that living organ donation was perceived as a reasoned action or planned behavior: Participants considered and integrated the information to form attitudes and generated behavioral intentions according to the attitudes. Previous concern about other forces (e.g., emotional reactions) causing attitudes and behavioral intentions unrelated to the topic (Fishbein & Yzer, 2003) is eliminated from this path, therefore. This result may be generalizable to other prosocial behaviors. In general, based on these findings, prosocial behavior campaigns can adopt more rational approaches because audiences are rational and strategically plan in this case.

The study also demonstrated that when social distance was kept remote, far temporal distance could reduce the threat to freedom and, therefore, increase positive attitudes and behavioral intentions toward living organ donations. The result is in line with Katz et al.'s (2017) finding that increasing distance can decrease freedom threat and affect message effectiveness. This finding also revealed the high effectiveness of manipulating temporal distance in campaign messages. One phrase (i.e., now vs. anytime in the future) could significantly reduce the reactance and increase positive attitudes and behavioral intentions. However, inconsistent with Katz et al.'s (2017) result, social distance did not significantly influence psychological reactance when keeping temporal distance consistent. This result may be related to the prosocial behavior focus. Prosocial behavior intends to benefit others (Eisenberg et al., 2006) rather than self, and participants might also understand that they would help others, not themselves. Therefore, the manipulation of social distance (i.e., self vs. others) essentially did not work. This result suggests that social distance manipulations may not work well in practical prosocial behavior promotion.

Although social distance did not solely impact psychological reactance when keeping temporal distance consistent, the remote social distance combined with far temporal distance significantly mitigated psychological distance and increased behavior intention, compared to close social distance combined with close temporal distance. This result provided evidence to Huang et al.'s (2016) distance boosting effect, suggesting the effect of one dimension of psychological distance can increase the effect of the other. In the current study, when participants were considering others (rather than themselves), a far temporal distance ("anytime") reduced more psychological reactance, compared to a close temporal distance ("now"). In addition to providing theoretical support to the distance boosting effect of CLT, this result also benefits practical campaign message design. To amplify the mitigation of potential psychological reactance, increasing two dimensions of psychological distance at the same time can outperform increasing a single dimension of psychological distance. Moreover, the main findings of this study contribute to the reactance-mitigating literature. In addition to the strategies reviewed previously, such as avoiding forceful languages or adding restoration postscripts, a new possible strategy can be increasing the psychological distance indicated in a persuasive message.

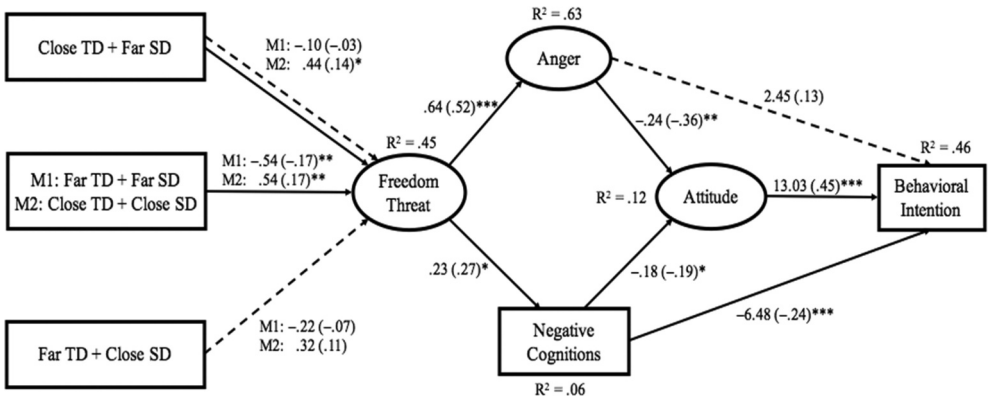

Figure 2. Final model ($N = 245$). TD refers to Temporal Distance. SD refers to social distance. M1 (Model #1) used the close temporal/close social distance condition as the reference group. M2 (Model #2) used the far temporal/far social distance condition as the reference group. Path coefficients related to the message conditions are present for both models. Path coefficients that are not directly related to the message conditions are the same for both models, so only one coefficient is presented on one path. Both unstandardized (B) and standardized coefficients (β) are presented with standardized coefficients shown in parentheses. Dashed lines represent non-significant paths.*$p < .05$. **$p < .01$. ***$p < .00$.

In addition to the hypothesized findings, there was an unexpected finding regarding the intertwined psychological reactance model. Contrary to past research on measuring psychological reactance, anger and negative cognitions did not load on a single factor and were not correlated. After reviewing previous reactance research, we speculated that this inconsistency was probably due to the stimulus being different from what has been traditionally used in reactance experiments (e.g., Quick et al., 2016). The stimuli used in some psychological reactance experiments are relatively lengthy and focus particularly on the action needed to be taken. However, the messages used in the current study not only focused on the call to action, but also on setting up the importance of the donation, which mirrors the naturalistic messages in a practical campaign. Thus, the negative cognitions may function differently depending on the message's other characteristics. In other words, the typical psychological reactance stimuli are better designed to invoke negative cognitions that run parallel to the angry emotions (e.g., "Stop the denial! Given the need for organ donors, a responsible person would consent to be an organ donor" Quick et al., 2011, p. 678). However, more naturalistic prosocial behavior messages steer away from this, perhaps because campaign professionals understand the dangers of psychological reactance. Instead, in the current study, more negative cognitions are related to fear and uncertainty about living organ donation (e.g., "I would be scared to make a living donation," "I wondered about the cost of medical bills and loss of work if you donate") which are less correlated with anger.

In addition to the theoretical and practical implications, this study also contributes to the conversations surrounding the measurement of negative cognitions. Reynolds-Tylus et al. (2020) recently compared three approaches to measure negative cognitions: 1) participant-coding (thought-listing) , 2) trained coder (thought-listing), and 3) Likert scale. The current study utilized the first two approaches. Consistent with Reynolds-Tylus et al.'s (2020) finding, participant-coding and trained coder approaches generated similar results. However, inconsistent with their results, negative cognitions and anger did not load on a single factor to form an intertwined model. Reynolds-Tylus et al. (2020) argued the relatively novel three-item Likert scale measure approach is superior to the other two measures with regard to fit, variance explained, and factor loadings. Accordingly, the poor loading of negative cognitions in our current model might provide a "negative example" to support that it is worth including a Likert scale measure in future research. However, we do not recommend completely eliminating the thought-listing measure because those qualitative texts can provide essential insights into messages' details. For example, without examining the specific thoughts that participants generated, we would not know the negative cognitions about living organ donation were more related to fear and uncertainty, rather than anger. Reynolds-Tylus et al. (2020) also suggested that the thought-listing measure would be more illuminating for formative research from which researchers intend to figure out why a message is effective or not. Hence, we recommend researchers consider including both measures if planning to understand specific details of negative cognitions to improve message design.

Limitations and conclusions

Due to this study only examining one prosocial behavior topic, additional research should focus on broadening the scope to determine whether findings from this research are an anomaly due to the particular topic or hold true to other prosocial health behavior messages. As mentioned previously, negative cognitions did not load on a single factor, and it was not correlated with anger. This could be because of the stimuli messages or the measurement tool itself. The current measurement tool used for psychological reactance appears especially problematic for prosocial-based messaging due to the inability to know if reactions result from message characteristics or toward the situation being presented (Turner, 2007). A potential alternative from the traditional thought-listing approach could be to use a three-item Likert scale proposed in Reynolds-Tylus et al.'s (2020) study, as discussed above.

Future research should also consider including a true control condition in the experimental design to increase its theoretical contribution. Currently, both close- and far-distance messages may cause a relatively low freedom threat, although there was a significant difference in freedom threat elicited by these two types of messages. Therefore, it is challenging to argue that increasing psychological distance is also effective in high freedom threat conditions. Using a strong reactance-inducing message as a control condition, however, will allow us to see whether our proposed message strategy also mitigated reactance in a high freedom threat condition. Thus, to increase the validity in the theoretical sense, a strong reactance-inducing message should be considered to include in the experiment as a control condition in future studies.

Despite these limitations, based on hypothesized and unexpected findings, several implications for PRT and practice are established. First, considering practitioners seem to recognize the danger of psychological reactance, the messages used to elicit psychological reactance would be better designed in a more naturalistic way to inform industry use. The results showed that even one word (e.g., "now") could elicit psychological reactance, which is a message characteristic that communication practitioners can easily deploy. When designing campaign messages, therefore, communication professionals may consider switching the word "now" to "anytime" to mitigate any psychological reactance caused by the close psychological distance. Second, when utilizing naturalistic messages in the study, it would be better to consider *not* linking negative cognitions to anger to form a single factor. Instead, measuring freedom threat as an indicator for reactance, as done in other psychological reactance studies (e.g., Kim et al., 2017). Finally, this study's findings point to the need for prosocial health behavior communication to incorporate both rational and irrational processing into message design to elicit desired responses.

Notes

1. The experimental design did not include a control group because this study focused on testing whether far psychological distance will exert less reactance than close psychological distance, rather than comparing far or close psychological distance to the control condition in which the message does not indicate any psychological distance.
2. All stimuli messages are available from the corresponding author.
3. The 14-item HPRS did not fit well in our model, so the validity of the scale was checked before proceeding to the next step. We found that previous research had difficulty identifying the psychometric properties of this scale (Sinclair et al., 2015). For example, some studies found a four-factor model fit the HPRS scores the best (e.g., Brown et al., 2011; Hong & Faedda, 1996; Hong & Page, 1989), some studies supported a second-order model, in which four factors existed at the first-order and an overall trait reactance being treated as unidimensional at the second-order (e.g., Shen & Dillard, 2005), while some studies demonstrated a bifactor model resulted in greater model fit (e.g., Yost & Finney, 2018). It seems the modeling solution of the HPRS depends on the specific studies. We applied all the above-mentioned modeling solutions to the HPRS scores in the current study, but none of them produced an acceptable fit (for the four-factor model: RMSEA = .099 (.085 – .112); for the second-order model: RMSEA = .148 (.131 – .165); for the bifactor model: RMSEA = .126 (.112 – .140)). Therefore, we conducted our own factor analysis for the current study and adjusted the items to fit the measurement model for this study. In the current final measurement model, the items kept for analysis on the HPRS scale included: item 1, item 2, item 3, item 5, item 9, item 13, and item 14 (See Hong & Page, 1989 for specific items). In addition to relying on the modeling results, we finalized these items that were also based on conceptual reasoning. These items explained three out of four factors that concluded in the previous four-factor model (Hong & Faedda, 1996; Shen & Dillard, 2005): reactance to compliance (item 1, 2, and 3), resisting influence (item 13 and 14), reactance to advice (item 5 and 9). The items related to the last factor, emotional response (item 4, 6, 7, and 8), significantly hurt the model fit, so we considered deleting those items. Miron and Brehm (2006) also cast doubt on the items on the HPRS measuring an "affective state" (p. 7). They commented that "the explanatory power of these scales is low perhaps because of the different threat situations covered by these scales items;" therefore, "there is little to gain from the conceptualization of reactance as a personality trait" (p. 7). This may also explain why these items did not fit well in our model. Thus, we decided to remove items related to the emotional response from the final measurement model in this study.
4. To improve the model fit, we correlated two items of the freedom threat scale as the model inspection results indicated: Item 1 (The message threatened my freedom to choose) and Item 4 (The message tried to pressure me). The text meanings of these two items are similar, so we considered it appropriate to correlate them.
5. Model #1 and Model #2 had identical model fit indices because they were the same model just with different reference groups.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendix

Table A1. Summary of correlations, means, standard deviations for trait reactance, freedom threat, anger, negative cognition, attitude, and behavioral intention.

Measure	1	2	3	4	5	6
1. Trait reactance	1.00					
2. Freedom threat	.58***	1.00				
3. Anger	.65***	.70***	1.00			
4. Negative cognition	−.10	.11	.01	1.00		
5. Attitude	−.06	−.21**	−.22***	−.21**	1.00	
6. Behavioral intention	.37***	.17**	.23***	−.38***	.44***	1.00
M	3.81	3.73	2.69	.69	5.67	50.98
SD	1.54	1.76	1.91	1.16	1.20	30.79

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