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Differential Effects of Message Framing on Obesity Policy Support
between Democrats and Republicans

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Abstract

This study tests whether gain- and loss-framed messages about establishing obesity-reducing policies have different persuasive effects on Republicans and Democrats. In a randomized between-subject experiment, participants ($N = 384$) read a message emphasizing either benefits to a society by establishing policies aimed to reduce obesity (i.e., gain-framed message) or costs to a society that fails to establish those policies (i.e., loss-framed message). Results indicated that Democrats perceived the gain-framed message as more persuasive than the loss-framed message and the perceived argument strength fully mediated the framing effect on Democrats' policy support; however, there was no framing effect on perceived argument strength among Republicans. On the other hand, the gain-framed message led Republicans to attribute the cause of obesity less to the individual level compared to the loss-framed message and the no message condition. We observed no framing difference among Democrats on causal attributions. Theoretical and practical implications of these findings are discussed.

Differential Effects of Message Framing on Obesity Policy Support between Democrats and Republicans

Introduction

Obesity is the second-leading cause of preventable death in the United States (Mokdad, Marks, Stroup, & Gerberding, 2004) and is associated with various types of health issues, including type 2 diabetes, hypertension, certain types of cancers, as well as overall quality of life (Kumanyika et al., 2008). Seventeen percent of youth, aged between 2 and 14, and 35% of adults, aged 20 or older, were obese in 2009-2010 (Ogden, Carroll, Kit, & Flegal, 2014). Because obesity is a result of a combination of different causes, including individual factors (e.g., diet- and exercise-related decisions) as well as societal factors (e.g., neighborhood conditions and socioeconomic context), scholars argue for the importance of collective actions that support responsible health decisions through policy and environmental change (e.g., Brownell et al., 2010).

Recent investigations have examined messages that emphasize different causal factors (i.e., individual, societal, or combined) to better promote public support for societal-level interventions regarding obesity (e.g., Gollust, Lantz, & Ubel, 2009; Niederdeppe, Shapiro, Kim, Bartolo, & Porticella, 2014). However, to our knowledge, no study to date has examined the relative efficacy of gain- (emphasizing benefits of establishing obesity-related policies) and loss-framed messages (emphasizing costs of not establishing obesity-related policies) at promoting obesity-related policy support. Also, only one study to date, Nan and Madden (2014), has looked at how gain- and loss-framed messages influence policy support in the context of Human Papillomavirus (HPV) vaccination mandate, while most studies exclusively focus on personal

health outcomes (Kim, 2012, 2014; Nan, 2012; Quick & Bates, 2010; Yan, Dillard, & Shen, 2012; Zhao & Nan, 2010).

Meta-analytic studies on framing effect have found marginal or no difference between gain- and loss-framed messages; thus O'Keefe and Jensen (2006, 2007, 2009) suggested investigating potential moderators that could shed some light on boundary conditions for the message framing effect. In light of this claim, health communication researchers have been interested in individual predispositions that shape message framing effects (e.g., Hull & Hong, 2016; Nan & Madden, 2014). Contributing to this line of research, we propose individuals' political predispositions, specifically political party affiliation, to shape effects of gain- and loss-framed messages in encouraging public support for obesity-relevant policies. In prior research, individuals' political predispositions predicted obesity-related policy preference and formed how individuals respond to messages that advocate societal solutions to the obesity epidemic (Gollust et al., 2009; Lee, Shapiro, & Niederdeppe, 2014; Niederdeppe et al., 2014). More importantly, political predispositions are grounded in motivations to avoid threat and uncertainty (Jost, Glaser, Kruglanski, & Sulloway, 2003). Because evaluation of risk, associated with an advocated course of action, is the key explanatory factor for the relative efficacy of gain- and loss-framed messages (Rothman, Bartels, Wlaschin, & Salovey, 2006; Rothman & Salovey, 1997), those with different political predispositions are likely to respond differently to gain- and loss-framed messages. Improving our understanding of the role of political predispositions in message framing effects is important for developing tailored communication to build public support on societal-level interventions to obesity.

Gain- vs. Loss-Framed Messages

Gain-framed messages emphasize what people can gain if they follow recommendations

in a message (e.g., “if you support policies aiming to prevent and reduce obesity, the obesity rate of society will reduce”). On the other hand, loss-framed messages focus on what people can lose if they do not follow the recommendations (e.g., “if you do not support policies aiming to reduce and prevent obesity, the obesity rate of society will not go down”). Although the advocated course of action is the same (i.e., support policies), these two message frames can produce different persuasive effects. In some cases, gain-framed messages are more effective than loss-framed messages and in other cases, the opposite is true. For successful health campaigns, it is critical to identify when to use gain- and loss-framed messages.

Health communication researchers have examined boundary conditions for the relative persuasive advantage of gain- versus loss-framed messages. One of the most widely studied antecedents is the type of advocated behavior, whether a message is to promote detection or prevention behaviors (A. Edwards, Elwyn, Covey, Matthews, & Pill, 2001; Kuhberger, 1998; Rothman & Salovey, 1997). According to the Prospect Theory (Kahneman & Tversky, 1979; Tversky & Kahneman, 1981), people tend to seek risks when the message is about costs or losses and avoid risks when the message is about benefits or gains. Applying this theory to health communication, Rothman and Salovey (1997) propose that loss-framed messages are more effective in promoting detection behaviors than gain-framed messages; but less effective in promoting prevention behaviors. Because detection behaviors, such as mammography, have the potential to provide undesirable health information (i.e., presence of diseases), loss-framed messages are more effective than gain-framed messages. On the other hand, prevention behaviors, such as a regular use of sunscreen, are aimed to achieve desirable outcomes (i.e., to maintain a healthy status and to reduce the risk of future illness); thus, gain-framed messages are more effective than loss-framed messages.

Meta-analyses conducted by O'Keefe and Jensen (2006, 2007, 2009), however, found small effects only in limited contexts, highlighting the need for identifying better moderators of the framing effect. One possibility for this is that individuals' message processing style has a stronger effect than the contextual factor, such as detection vs. prevention behaviors. Each individual has his/her own style in processing and evaluating risk- and health-related information. Prior research has found different message framing effects by cognitive processing styles or predispositions, such as attentional style (Miller et al., 1999), approach and avoidance motivations (Mann, Sherman, & Updegraff, 2004), cultural worldview (Nan & Madden, 2014), and sensation-seeking (Hull & Hong, 2016). Along with these studies, the current study proposes that individuals' political predispositions influence their responses to gain- and loss-framed messages on obesity-relevant issues.

Political Predispositions and Policy Support

Political predispositions, such as political party affiliation (e.g., Republicans, Democrats), ideology (e.g., conservatives, liberals), authoritarianism (e.g., right- or left-wing political view), play an important role in guiding individuals' message processing and producing different message effects (Deppe et al., 2015; Lee et al., 2014; Skitka, Mullen, Griffin, Hutchinson, & Chamberlin, 2002). Jost et al. (2003) explains that these political predispositions stem from individual differences in motivations to avoid threat and uncertainty: conservatives have a greater fear of threat or loss compared to liberals. For instance, individuals on the right wing of the authoritarian spectrum – who are considered more conservative (Jost et al., 2003) – express greater fear of being victims of terrorists, accidents, and AIDS than those low in authoritarianism (Altemeyer, 1996). In the context of obesity, raising awareness about the possible costs of failing to establish obesity policies, that these individuals have not previously considered, would be

perceived as a threat and would lead to uncertainty. Additionally, people with different political predispositions could react differently to such a message.

Because persuasion effects can be maximized when persuasion appeals are psychologically congruent or match a recipient's motivational or cognitive characteristics (Cacioppo, Petty, & Sidera, 1982; Debono, 1987; K. Edwards, 1990; Lavine & Snyder, 1996, 2000; Snyder & Debono, 1985), individuals high in risk perception are more persuaded by a loss-framed message than a gain-framed message (Gallagher, Updegraff, Rothman, & Sims, 2011; Yan et al., 2012). In this sense, conservatives or Republicans, who would be more afraid of potential loss than liberals or Democrats, would believe that loss-framed messages are more persuasive than gain-framed messages. Consistent with this proposition, Lavine et al. (1999) show that high authoritarians (high in conservatism) rated a threat message that emphasizes the potential loss and costs of failing to vote as more valid and persuasive than a reward message that emphasizes the benefits of voting; on the other hand, low authoritarians (low in conservatism) rated the threat message as less valid and persuasive than the rewards message. In a recent study (Nan & Madden, 2014), a loss-framed (vs. gain-framed) message resulted in greater support for HPV vaccination mandate for those with a hierarchical worldview – who tend to be conservatives and Republicans (Wildavsky & DakeSource, 1990)– whereas the reverse was found for those with an egalitarian worldview.

We intend to replicate these findings in the context of obesity-related policy support. Both Republicans and Democrats would learn the benefits of establishing policies in gain-framed messages and the costs of failing to establish policies in loss-framed messages. However, because Republicans are sensitive to risk-related information (i.e., loss and costs), they would perceive a loss-frame as more persuasive than a gain-frame, and Democrats would show the

opposite pattern, consistent with Nan and Madden (2014). As a proxy for perceived persuasiveness, we measured perceived argument strength.

Hypothesis 1 (H1). (a) Republicans believe that a loss-framed message is a stronger argument than a gain-framed message and (b) Democrats believe that a gain-framed message is a stronger argument than a loss-framed message.

On the other hand, it is largely unknown how moderates or Independents would perceive and respond to gain- and loss-framed messages. According to Pew Research Center (2016), a growing number of American voters consider themselves as Independents and in 2015, about 40% of Americans consider themselves Independents. Prior studies on the role of political predispositions in message framing (Lavine et al., 1999; Nan & Madden, 2014) did not look at moderates/Independents separately because they examined with continuous variables (i.e., cultural views and authoritarian). Thus, we pose a research question to examine the framing effect among Independents.

Research Question 1 (RQ1). Do Independents perceive a gain- or loss-framed message as a stronger argument than the other?

Perceived argument strength has been found to predict actual persuasive outcomes (Dillard, Shen, & Vail, 2007). The more individuals believe that a message is effective in persuading people to support obesity-related policies, the more likely they are to support those policies. Thus, we propose that perceived argument strength mediates the interaction effect between message framing and political party (proposed in H1 and RQ1) on policy support.

Hypothesis 2 (H2). Perceived argument strength mediates the interaction between message framing and political party affiliation on policy support.

Causal Attributions of Obesity and Message Frames

Causal attribution judgment has been suggested as an important predictor of obesity-related policy support (Lee et al., 2014; Niederdeppe et al., 2014). Republicans/conservatives are more likely to attribute a cause of social issues, including obesity (Lee et al., 2014), poverty (Furnham, 1982; Griffin & Ohenebasakyi, 1993) and crime (Carroll, Perkowitz, Lurigio, & Weaver, 1987), to the individual level and are less likely to acknowledge the role of social, structural factors than Democrats/liberals, while Independents/moderates' position is between them. Due to these systematic differences in causal attributions, Republicans tend to find the solution to obesity at the individual level, resulting in less support for obesity-related policies compared to Democrats and Independents (Gollust et al., 2009; Lee et al., 2014; Niederdeppe et al., 2014). To endorse societal-level solutions among Republicans, therefore, it is important to change Republicans' beliefs about the cause of obesity. However, it is largely unknown how gain- and loss-framed messages about the social determinants of obesity would influence causal attributions about obesity for political partisans.

One possibility is that a loss-framed (vs. gain-framed) message increases individual causal attributions and decreases societal attributions among Republicans, strengthening Republicans' conservative beliefs. Scholars have suggested that any fear or threat, such as the Great Depression, can cause individuals to react more conservatively (Sales, 1972, 1973; Sales & Friend, 1973), especially among Republicans. In an experiment (Feldman & Stenner, 1997), threatening messages caused authoritarians to have even stronger authoritarian beliefs. Based on these findings, when Republicans receive threatening messages, such as loss-framed messages, they may become more conservative and, thus, attribute the cause of obesity even more to the individual level and less to the societal level. However, another possibility is that, consistent with the pattern proposed on perceived argument strength (H1), Republicans may find a loss-framed

(vs. gain-framed) message to be more persuasive and, thus, attribute the cause of obesity less to the individual level and more to the societal level (the reverse applies to Democrats). Due to these opposite predictions, we pose a research question to investigate differential framing effects on causal attributions of obesity among political partisans.

Research Question 2 (RQ2). How do gain- and loss-framed messages influence Republicans, Democrats, and Independents' individual and societal causal attributions about obesity?

Lastly, we examine how causal attributions are associated with policy support. When individuals attribute a social issue more to the societal level, they are likely to agree with societal-level solutions and support relevant policies (Lee et al., 2014; Niederdeppe, Roh, & Shapiro, 2015; Niederdeppe et al., 2014). We test if the relationship is replicated.

Hypothesis 3 (H3). As individuals attribute the causes of obesity more to the societal level, they are likely to support relevant policies.

However, it is unclear how individual causal attributions are associated with policy support. Thus, we leave it as a research question.

Research Question 3 (RQ3). How are individual causal attributions associated with policy support?

Method

Participants and Procedure

We conducted a quasi-experiment, having a 3 (message: gain-frame vs. loss-frame vs. no message) x 3 (political predisposition: Democrats vs. Republicans vs. Independents) factorial design. The inclusion of a no message condition was to permit accurate conclusions about the efficacy of message frame conditions. To recruit fairly equivalent numbers of participants in

each political party, we assigned a quota. Out of 384 total participants, 37 % ($n = 141$) self-identified as Democrats, 26 % ($n = 99$) as Republicans, 29 % ($n = 113$) as Independents, and 8% ($n = 31$) as something else. Participants who identified themselves as something else were excluded for further analyses because their political predispositions were unclear.

Participants were recruited via Amazon mechanical turk (mturk.com), an on-line crowdsourcing service where requesters recruit workers for intellectual tasks and workers voluntarily choose tasks to perform. After completing tasks, workers receive a small amount of money as compensation. Recently, many social scientists have begun to consider mechanical turk as a useful data collection tool (see Berinsky, Huber, & Lenz, 2012; Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010).

Participants' ages ranged from 18 to 72 ($M = 38.92$; $SD = 13.08$) and 39 % of the participants were male (3 refused to reveal their gender). Most of the participants were non-Hispanic White (81.3%), while some of them were non-Hispanic Black (7.1%), Hispanic (4.8%), Asian (4.5%), or other (2.3%) (one refused to reveal his/her race).

After consenting to participate in the study, participants were randomly assigned to either a gain-framed message, a loss-framed message, or a no message condition. Participants in the two message conditions were asked to read the message and to rate perceived argument quality of the message. All respondents reported causal attributions of obesity, policy support, and demographic information, including gender, age, and race. Participants received \$.5 after study completion (\$.05 if they were screened out due to the political party quota setting).

Stimuli Messages

We developed two message frame conditions: gain- and loss-framed messages (see Appendix). Both messages started with information about the prevalence of obesity in the US

and the serious consequences of being obese. The messages also explained public health experts' opinions on the obesity issue by including an expert's quote that suggests obesity can be attributed to societal and environmental factors beyond individual factors. Both messages then listed policy ideas that have been proposed to resolve the obesity issue in the US (e.g., Brescoll, Kersh, & Brownell, 2008). The two message conditions differed in explaining the reasons why obesity policies should be established in terms of benefits and costs that the community may experience.

The gain- and loss-framed message used in this study followed previously validated formats (Gerend & Shepherd, 2007; Gerend, Shepherd, & Monday, 2008) to present either benefits of establishing policy support or costs of failing to establish policy support. We did not conduct a manipulation check because, according to O'Keefe (2003), when manipulations are to vary intrinsic message features such as framing (Nan, 2012), a manipulation check is unnecessary. Prior framing research (Nan, 2012; Nan et al., 2016; Quick, Kam, Morgan, Liberona, & Smith, 2015) also did not conduct separate manipulation checks.

Participants in the no message condition ($n = 125$) moved directly to the post-message questionnaire without reading any message.

Gain-frame. Participants in the gain-framed message condition ($n = 116$) read a list of benefits a society may experience by establishing relevant policies. The list included “If grocers are required to add a surcharge to high-sugar, high-fat foods and to use the revenues to reduce their prices for fresh fruits and vegetables, consumers will buy healthy food at lower prices” and “If public schools make fresh fruit, vegetables, and low-fat milk available for free at school lunches and eliminate fast-food and soft-drink concession, more students will have healthy food at school.”

Loss-frame. Participants in the loss-framed message condition ($n = 112$) read a list of costs a society may experience by failing to establish policies. The list included “If grocers are not required to add a surcharge to high-sugar, high-fat foods and to use the revenues to reduce their prices for fresh fruits and vegetables, consumers will continue to buy healthy food at high prices” and “If public schools do not make fresh fruit, vegetables, and low-fat milk available for free at school lunches and eliminate fast-food and soft-drink concession, students will continue to eat unhealthy food at school.”

Measures

Perceived argument strength. Participants were asked to rate how much they agree or disagree with the five items¹ derived from Zhao, Strasser, Cappella, Lerman, and Fishbein (2009) (1 = strongly disagree; 5 = strongly agree): “This message gives a reason for supporting obesity policy that is believable,” “This message gives a reason for supporting obesity policy that is important to me,” “This message helped me feel confident about supporting obesity policy,” “This message would help others support obesity policy,” “This message put thoughts in my mind about supporting obesity policy.” We averaged 5 items to create a perceived argument strength scale (Cronbach’s Alpha = .93; $M = 3.50$; $SD = .95$).

Obesity-related policy support. Participants reported the extent to which they support each of 11 obesity-related policies on a 5-point scale (1 = strongly oppose; 5 = strongly support). These policies have been proposed to address the problem of obesity by public health experts (Brescoll et al., 2008; Niederdeppe, Roh, Shapiro, & Kim, 2013). Policies include “Require grocers to add a surcharge to high-sugar, high-fat foods and use the revenues to reduce their prices for fresh fruits and vegetables,” “Eliminate fast-food and soft-drink concessions from our public schools and use federal tax dollars to compensate the schools for the revenues they now

make on these concessions.” Responses were averaged to create a policy support scale (Cronbach’s Alpha = .89; $M = 3.68$; $SD = .80$).

Causal attributions for obesity. On a 5-point scale, participants reported their level of agreement (1= strongly disagree, 5 = strongly agree) on 8 statements about why Americans are overweight (Bleich & Blendon, 2010; Niederdeppe et al., 2013). Consistent with prior research that used similar items (Niederdeppe et al., 2013; Niederdeppe, Shapiro, & Porticella, 2011), factor analysis confirmed the two-factor solution: (1) individual attributions (4 items, e.g., “most people lack the willpower to exercise regularly,” Cronbach’s Alpha = .82, $M = 3.49$, $SD = .89$) and (2) societal attributions (4 items, e.g., “healthy food is too expensive for most people,” Cronbach’s Alpha = .74, $M = 3.36$, $SD = .92$). There was no statistically significant correlation between individual and societal causal attributions ($r = -.06$, $p = .26$).

Analytic Approach

We started the analysis by comparing participant profiles among conditions to check the success of random assignment. A series of ANOVA and chi-square tests revealed no significant demographic differences (e.g., age, gender, race) between message conditions; thus, randomization was deemed successful.

To examine H1, RQ1, and RQ2, we ran a series of analysis of variance (ANOVA) having participants’ political party (Democrats vs. Republicans vs. Independents) and message conditions (gain-framed vs. loss-framed vs. no message) as predictors and (a) perceived argument strength, (b) policy support, and (c) causal attributions as the dependent variables. We first examined the main effects of political party and message conditions, followed by the 3 x 3 interaction² between two predictors. Significant interactions were probed with focused post-hoc tests to examine our hypotheses. Testing H2, mediation was examined with the **MEDIATE**

macro (Hayes & Preacher, 2014). Finally, we examined H3 and RQ3 by running bivariate correlations between causal attributions and policy support.

Results

Message Framing Effect on Perceived Argument Strength (H1 and RQ1) and Policy Support (H2)

H1 and RQ1 were about if message framing has different effects on perceived argument strength depending on participant's political party affiliation. Specifically, we predicted persuasive advantage of a loss-framed (vs. gain-framed) message among Republicans (H1a) and the reverse among Democrats (H1b) and asked about the effect among Independents (RQ1). Because participants in the no message condition did not read the message and were not asked to rate perceived argument strength, two message conditions by three political parties were included. Using ANOVAs, a significant main effect of political party was found on perceived argument strength, $F(2, 222) = 4.38, p = .014, \eta^2 = .037$: Democrats perceived the message endorsing obesity policy as significantly more persuasive ($M = 3.74$) than Republicans ($M = 3.30$, pairwise $p = .009$) and Independents ($M = 3.40$, pairwise $p = .03$). However, no main effect of message conditions was found, $F(1, 222) = .65, p = .31$.

A marginally significant interaction was found on perceived argument strength between political party and message conditions, $F(2, 222) = 2.59, p = .078, \eta^2 = .02$. As presented in Figure 1, Republicans did not rate argument strength differently between the gain-framed message ($M = 3.33; SD = 1.17$) and the loss-framed message ($M = 3.26; SD = .96$), $F(1, 63) = .08, p = .77$ (H1a rejected). However, Democrats rated the gain-framed message ($M = 3.94; SD = .70$) as more persuasive than the loss-framed message ($M = 3.49; SD = .91$), $F(1, 86) = 6.61, p = .01, \eta^2 = .07$ (H1b supported). Independents perceived the loss-framed message ($M = 3.51; SD = .68$)

as slightly more persuasive than the gain-framed message ($M = 3.29$; $SD = 1.14$), but it did not reach the statistical significance, $F(1, 73) = 1.03$, $p = .31$ (RQ1).

H2 predicted that perceived argument strength would mediate the interaction effect between message frame and political party affiliation onto policy support. Using a 3 (gain- vs. loss-framed vs. no message condition) x 3 (Democrats vs. Republicans vs. Independents) ANOVA, we found a significant main effect of political party on policy support, $F(2, 344) = 26.06$, $p < .001$, $\eta^2 = .13$: Democrats reported greater policy support ($M = 3.99$) than the two other political party categories ($M_{\text{repub}} = 3.27$, $M_{\text{indep}} = 3.65$; all pairwise comparisons $p < .001$). However, there was no significant main effect of message conditions, $F(2, 344) = .71$, $p = .49$, and interaction on policy support between message conditions and political party, $F(2, 344) = .67$, $p = .61$.

Although we found no direct effect on policy support, a significant direct effect is not a requirement for mediation (Preacher & Hayes, 2008). We, thus, examined whether perceived argument strength indirectly carried the message frame by political party affiliation effect onto policy support (H2). Because Republicans (H1a) and Independents (RQ1) did not show a message frame difference in perceived argument strength, only Democrats were included in the mediation analysis. A mediation test, using the MEDIANTE macro (Hayes & Preacher, 2014), indicated that perceived argument strength fully mediated the effect of message frame on policy support among Democrats. Democrats rated the gain-framed message as a stronger argument than the loss-framed message, $b = .44$, $SE = .17$, $p = .01$, and the perceived argument strength was positively associated with policy support, $b = .46$, $SE = .06$, $p < .001$. As presented in Figure 2, although the direct effect of message framing was not significant, $b = -.03$, $SE = .10$, $p = .72$, the indirect effect was significant, $b = .20$, $SE = .09$, 95% $CI [.06, .39]$. Thus, H2 was supported

among Democrats.

Message Frame Effects on Causal Attributions (RQ2)

RQ2 was posed to examine whether message frames change causal attributions of obesity differently by participant's party affiliation. 3 x 3 ANOVA analyses indicated that individual causal attributions, $F(2, 344) = 6.04, p = .003, \eta^2 = .03$, and societal causal attributions, $F(2, 344) = 5.23, p = .002, \eta^2 = .04$, significantly differed by political party affiliation. Democrats reported lower individual causal attributions ($M = 3.29, SD = .93$) than Republicans ($M = 3.62, SD = .82, p = .004$) and Independents ($M = 3.61, SD = .85, p = .003$) and higher societal causal attributions ($M = 3.57, SD = .83$) than Republicans ($M = 3.14, SD = 1.02, p = .001$) and Independents ($M = 3.29, SD = .89, p = .019$). Although societal causal attributions did not differ by message conditions, $F(2, 344) = .24, p = .79$, individual causal attributions differed by them, $F(2, 344) = 3.11, p = .046$: The gain-framed message ($M = 3.33, SD = .92$) led to lower individual causal attribution than loss-framed message ($M = 3.56, SD = .90, p = .045$) and no message ($M = 3.56, SD = .82, p = .02$) while there was no difference between the loss-framed message and no message ($p = .81$).

A significant interaction was found on individual causal attributions between message conditions and political party, $F(4, 344) = 2.96, p = .02, \eta^2 = .03$. When separately analyzed by political party, we observed message frame effects only among Republicans, $F(2, 96) = 5.64, p = .005, \eta^2 = .11$ (Democrats, $p = .28$; Independents, $p = .104$). Among Republicans, the gain-framed message ($M = 3.23; SD = .82$) led to significantly lower individual attributions compared to the loss-framed message ($M = 3.74, SD = .89; p = .01$) and the no message ($M = 3.85, SD = .63; p = .002$). A marginally significant interaction was found on societal causal attributions of obesity, $F(4, 375) = 2.07, p = .08, \text{partial } \eta^2 = .03$; however, when analyzed separately, we found

no significant message frame effect on societal causal attributions regardless of political party affiliation.

Association between Causal Attributions and Policy Support (H3 and RQ3)

Lastly, H3 predicted that policy support is associated with increased societal causal attributions and RQ3 posed the relationship between policy support and individual causal attributions. Bivariate correlation analyses revealed that policy support was positively associated with societal causal attributions ($r = .64, p < .001$; H3 supported); but no association was observed with individual attributions ($r = -.002, p = .98$; RQ3).

Discussion

This study offers evidence that gain- and loss- framed messages have different persuasive effects depending on message recipients' political predispositions. Building upon prior research that suggests individual's processing style or predisposition shapes framing effects (Gallagher et al., 2011; Mann et al., 2004; Miller et al., 1999; Nan & Madden, 2014), this study enhances our understanding of how Republicans and Democrats differently interpret messages conveying information about why policies should be established.

Political predisposition is closely associated with both policy support and message processing; thus, it can play an important role in the effect of message framing on policy support. This study provides an initial evidence that political predispositions, particularly party affiliation, serve as important moderators in determining the relative efficacy of gain- and loss-framed messages. In addition, this is one of few studies to investigate framing effects on health policy support beyond personal health decisions, which, until recently, have not received much attention from researchers despite its importance (Nan & Madden, 2014).

Consistent with a recent finding among egalitarians (Nan & Madden, 2014), who are likely belonging to the Democratic party, we found a persuasive advantage of a gain-framed message over a loss-framed message among Democrats. Having found the same patterns in a different context, health policy advocates are likely to have a better chance to persuade Democrats by emphasizing the gains and benefits of the policy being advocated. It is likely that Democrats and liberals are predisposed to seek gains and benefits (i.e., promotion focused) rather than to avoid losses and costs of the advocated action (i.e., prevention focused) (Higgins, 2000). We are, however, unaware of studies that specifically examine regulatory focus by political predispositions; future work should confirm our suggested proposition. Among Democrats, perceived argument strength appears to be an important mediator that translates the positive effect of a gain-framed message (vs. loss-framed) in (maintaining and) enhancing their support for societal solutions regarding obesity. It would be worthwhile to examine other factors that enhance perceived argument strength in delivering messages tailored to Democrats.

It should be noted, however, that the predicted message effects were not found among Republicans. In light of prior research that suggests conservatives are more sensitive to fear of threat or loss compared to liberals (Jost et al., 2003), we predicted that Republicans would be more responsive to a loss-framed message than a gain-framed message. On the contrary, gain- and loss-framed messages did not show any difference in perceived argument strength among Republicans. One possible explanation is Republicans' resistance to accept the message endorsing societal solutions to obesity, such as counterarguing. Compared to liberals, conservatives tend to be more resistant to messages that address societal causes of health issues (Gollust et al., 2009). Because the message used in the current study focused on social determinants of obesity, Republican participants may have found the message is inconsistent

with their prior beliefs on the causes of obesity. This inconsistency could have prompted Republicans' resistance to the message and the production of counterarguments. Future work should examine this possibility by measuring each participant's counterargument or negative cognitive responses.

Despite the lack of framing effect on perceived argument strength among Republicans, those in the gain-framed message condition rated significantly lower individual causal attributions compared to those in the loss-framed message and no message condition. One possible explanation is the anxiety participants could have experienced while reading the loss-framed message that is likely absent when reading a gain-framed message. The more people think about a social issue deeply, the less likely they are to find individual causal attributions (Lee et al., 2014; Skitka et al., 2002). Republicans exposed to a gain-framed message likely had a chance to think deeply about the obesity issue, allowing them to attribute the causes of obesity less to the individual level. On the other hand, the loss-framed message could have triggered anxiety, which hinders deeper information processing (for a review, see Eysenck, 1979), because Republicans are aversive to loss and threat. Thus, in response to the loss-framed message, Republicans could not think about the issue deeply, resulting in the same level of individual causal attributions as those who were not exposed to any message. This speculative explanation, however, warrants further research. A future study could test this possibility by measuring or manipulating participants' anxiety level while processing persuasive messages.

It is noteworthy that a gain-framed message led Republicans to rate lower individual causal attributions than a loss-framed message in light of prior research that suggests a threat message makes conservatives even more conservative than a reward message (Feldman & Stenner, 1997). Feldman and Stenner (1997) found that authoritarians, exposed to a threat

message, became more authoritarian than those exposed to a reward message. Complementing this pattern, the result of the current study suggests that a gain message (vs. a loss message) can make Republicans, who tend to be authoritarians, less conservative by putting less emphasis on individual causal attributions. Because Feldman and Stenner (1997) did not include a no message condition, they could not confirm whether a gain- or loss-framed message influences authoritarians compared to their baseline perceptions. By including a no message condition, we demonstrate that a gain-framed message can shift Republicans' causal attributions toward a less conservative direction compared to their existing beliefs about the causes of obesity.

Although several studies have found factors that change the perceptions of liberals (Gollust et al., 2009; Lee et al., 2014; Niederdeppe et al., 2011), only few studies (Niederdeppe et al., 2014) have identified factors that turn conservatives' beliefs in a more liberal direction. Our results suggest that message framing could be a useful strategy in moving conservatives' beliefs in a less conservative (or more liberal) direction. At the same time, some scholars emphasize the need for maintaining individual causal attributions because reducing individual causal attributions may negatively impact people's health decisions at the individual level (Niederdeppe et al., 2013). We were unable to confirm whether lowering Republican's individual causal attributions for obesity led to less healthy diet and exercise behaviors among these individuals. Future work should further investigate the influence of changes in individual causal attributions to better understand their roles in individual health promotion as well as in encouraging obesity-related policy support.

Although a gain-framed message (vs. a loss-framed) caused Republicans to put less emphasis on the individual causal attributions for obesity, this effect did not lead to obesity-related policy support due to the lack of a significant relationship between individual causal

attributions and policy support. On the other hand, policy support was positively associated with societal attributions, consistent with prior research findings (Barry, Brescoll, Brownell, & Schlesinger, 2009; Niederdeppe et al., 2013; Oliver & Lee, 2005). In light of the insignificant correlation between individual and societal causal attributions, these attributional judgments are likely to be orthogonal. Combined, our findings suggest that effective messages to increase support for obesity-related policies should aim to increase societal causal attributions rather than reduce individual causal attributions. We, however, observed no framing effect on societal causal attributions; thus, future research should identify message strategies with the potential to enhance societal causal attributions, especially among Republicans who are less likely to endorse societal solutions to obesity.

On the other hand, Independents' ratings on dependent variables did not differ depending on whether they received a gain- or loss-framed message or no message. So far, compared to Republicans and Democrats, Independents have not received much attention in health communication research. However, as an increasing number of Americans identify as Independents (Pew Research Center, 2016), researchers need to pay attention to how Independents understand health-related messages and how they are influenced by the messages. Future research needs to look at Independents' interest in political issues and if their interest influences the effects of message.

Theoretical and Practical Implications

This study contributes to several bodies of literature. O'Keefe and Jensen (2006, 2007, 2009) proposed that identifying moderators of the message framing effect is important in framing research. Responding to this call, we proposed political predispositions to moderate the framing effect and found interesting patterns that contribute to the extant literature investigating

individual differences as potential moderators (e.g., Hull & Hong, 2016; Nan & Madden, 2014).

Message framing appears to be useful in endorsing policy support when matched with the intended audiences' political predispositions. For instance, our finding suggests that a gain-frame would be more persuasive than a loss-frame when addressing Democrats.

This study also provides some insights on how to change attribution judgments among Republicans. Because people rely on attribution judgments in making their policy decisions, health communication practitioners often aim to change people's attribution judgments. For example, if people attribute the cause of obesity to the societal level, they count on societal solutions, such as establishing relevant policies, to resolve the obesity issue. However, if people attribute the cause to the individual level, they believe that each individual should be accountable for making responsible health decisions, such as diet and exercise. Republicans tend to attribute the cause of obesity to the individual level and thus have been found particularly resistant to messages that address societal attributions and endorse policy solutions. Few studies (Niederdeppe et al., 2014) have shown that what messages can change the attribution judgments among Republicans. Filling this gap in the extant literature, our finding suggests a competitive utility of a gain-framed message at reducing Republicans' individual cause attribution compared to no message or a loss-framed message.

Message framing has been an important focus in health communication research; however, prior studies predominantly examined gain-/loss-framing effects in the context of individual behavior change (e.g., promoting healthy diet and exercise; with notable exception, Nan and Madden (2014)). The current study extends prior research by applying a framing approach to promote collective actions to resolve a health issue beyond individual level interventions. As Nan and Madden (2014) pointed out, building health-related policy support

provides a promising alternative context for testing message framing effects because people tend to be less resistant to policy messages than those addressing individual health behaviors. By having policy support as a context, the possible psychological resistance can be reduced and the framing message can be studied with reduced resistance, which may help explain the inconsistent findings reported on the gain-/loss-framing effects in O'Keefe and Jensen (2006, 2007, 2009).

Overall, this study suggests an advantage of a gain-framed message over a loss-framed message in that Democrats perceive the gain-framed messages are more persuasive and Republicans rated lower individual attribution to an obesity issue after reading the gain-framed message than the loss-framed one. However, these results need to be interpreted with several cautions, as discussed below.

Study Limitations and Future Research

Study results should be interpreted carefully within several constraints. First, the results of this study may not be generalizable to other policy contexts, especially those dealing with more imminent risks than obesity. Studies on message framing, including the current study, have treated individuals' risk assessment, pertaining to an advocated course of action in a message, as an important explanatory factor for the framing effect. Compared to other types of risks, such as the HPV vaccination mandate, people might not consider establishing an obesity-related policy to be risky or directly relevant to them. In a future study, message-framing effects on policy support should be examined with multiple contexts that involve variations of risk assessment.

The use of a single message is a clear limitation to be mentioned. We developed message conditions based on defining characteristics of gain- versus loss-framed messages, which were confirmed to be effective in prior framing studies (Gerend & Shepherd, 2007; Gerend et al., 2008; Meyerowitz & Chaiken, 1987; Nan, 2012). However, there may be individual peculiarities of

these messages for which we did not account and that limit generalizability of our findings.

Future works should replicate the findings reported here with multiple messages to provide more convincing evidence.

To resolve the obesity epidemic in the US, along with social and environmental changes, individual efforts through responsible health decisions are imperative. Thus, a future study could examine the effects of political predispositions on personal health outcomes such as individuals' intention to lose weight and their actual weight loss. Although some studies have tested framing effects on individuals' exercise behaviors (Gray & Harrington, 2011; McCall & Ginis, 2004), the role of political predispositions has not been examined in these studies. If political predispositions are associated with how individuals process and evaluate persuasive messages, the framing effects on obesity-reducing behaviors may also be influenced by political predispositions.

Like prior research testing obesity-related message frames (Niederdeppe et al., 2015), we measured participants' party affiliations without assessing the strength to which they are associated with the party. A future study could measure party affiliation strength to examine it as a potential moderator of the framing effect.

Although we employed a quota to recruit equal numbers of Republicans and Democrats, our sample had a lower representation of Republicans reflecting user profile of the mechanical turk. Also, our respondents were predominantly non-Hispanic White, limiting the generalizability of our findings to other ethnic groups. Nonetheless, sample representativeness is not a major issue in experiments and the data obtained from the mechanical turk are found to be more demographically diverse than other in-person convenience samples (Berinsky et al., 2012; Buhrmester et al., 2011; Paolacci et al., 2010). Future work should replicate our findings with

more balanced numbers of participants in each political party and in varying demographic populations.

Conclusions

This study suggests that gain- and loss-framed messages produce different persuasive effects depending on an individual's political predispositions. For Democrats, the gain-framed message appears to be more persuasive for promoting obesity-related policy support than the loss-framed message. For Republicans, the gain-framed message helps reduce individual causal attributions for obesity; however, this effect does not change their policy support. Future theorizing about framing effects should continue to develop ideas on message strategies to persuade individuals.

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Footnotes

1. We chose five items from the original 9-item perceived argument scale (Zhao et al., 2009) to limit the length of online questionnaire. We excluded semantically similar items such as “The statement is a reason for __ that is convincing”; “The statement put thoughts in my mind about not wanting to ____”; “Overall, how much do you agree or disagree with the statement?”; “Is the reason for the statement gave for ____ a strong or weak reason?”
2. We ran parallel analyses with 3 (message: gain- vs. loss-framed message vs. no message) x 2 (political parties: Republicans vs. Democrats) conditions on all DVs, excluding Independents. The results were consistent with the 3 x 3 interactions, except on perceived argument strength: the interaction became insignificant when Independents were not included, $F(1, 149) = 1.46, p = .229$. For simplicity, we report only 3 x 3 interactions in text.

Figure 1. Effects of message framing and political party affiliation on perceived persuasiveness.

Standard errors are represented in the figure by the error bars attached to each column.

Figure 2. Effects of message framing on support for relevant policies among Democrats. The indirect effect of message framing on support for policies via perceived persuasive is presented in parentheses; the loss-framed message serves as a reference; * $p < .05$.

Appendix

Obesity—everybody knows it’s bad and that it’s everywhere.

Currently, one in three US adults is obese, bringing forth a possible health toll, including high blood pressure, Type 2 diabetes, heart disease and stroke. Another third of Americans are overweight. The solution to their problem sounds deceptively simple – take in fewer calories a day, while cranking up the calorie-burning process with regular exercise.

However, public health experts emphasize that it’s not just a matter of obese people deciding they’re going to eat less or work out more. Societal and environmental factors beyond the control of individuals also contribute to increased obesity rates by reducing the likelihood of healthy eating and active living behaviors.

Rates of obesity are highest among people living in poor neighborhoods. Health expert Dr. Howard Smith says, “People who live in neighborhoods where the majority of stores sell food with high calories and low nutritional value, such as fast food restaurants or convenience stores, are much more likely to be obese.” Several other scientific studies have supported the idea that people’s neighborhoods, including not having convenient or safe places to exercise, and being exposed to many advertisements selling high-calorie foods, are associated with the development of obesity-related diseases.

Many different policy ideas have been proposed to address the problem of obesity in the US.

Why should we establish policies to resolve obesity?

[Gain-Framed Message]

There are many *benefits* you and your community may experience if obesity policies are established:

1. If laws require more spaces for exercise, including parks and sidewalks, people will be more encouraged to do physical activity.
2. If restaurants are required to provide information about the calorie count and fat content of all items on their menus and to use the healthiest ways of cooking, customers’ intake of calorie will reduce.
3. If grocers are required to add a surcharge to high-sugar, high-fat foods and to use the revenues to reduce their prices for fresh fruits and vegetables, consumers will buy healthy food at lower prices.
4. If individuals are provided with tax credits for gym memberships or nutritional counseling, their use of gym or nutritional counseling will increase.
5. If a government-funded public education campaign on healthy eating and exercise is created, people will learn more about healthy eating and exercise.
6. If public schools make fresh fruit, vegetables, and low-fat milk available for free at school lunches and eliminate fast-food and soft-drink concession, more students will have healthy food at school.

7. If the sale of local foods across the community is supported, more people will be able to use healthy local foods.

[Loss-Framed Message]

There are many *costs* you and your community may experience if obesity policies are not established:

1. If laws do not require more spaces for exercise, including parks and sidewalks, people will not find safe spaces for physical activity.
2. If restaurants are not required to provide information about the calorie count and fat content of all items on their menus and to use the healthiest ways of cooking, customers' intake of calorie will not reduce.
3. If grocers are not required to add a surcharge to high-sugar, high-fat foods and to use the revenues to reduce their prices for fresh fruits and vegetables, consumers will continue to buy healthy food at high prices.
4. If individuals are not provided with tax credits for gym memberships or nutritional counseling, their use of gym or nutritional counseling will not increase.
5. If a government-funded public education campaign on healthy eating and exercise is not created, people will not be able to learn about healthy eating and exercise.
6. If public schools do not make fresh fruit, vegetables, and low-fat milk available for free at school lunches and do not eliminate fast-food and soft-drink concession, students will continue to eat unhealthy food at school.
7. If the sale of local foods across the community is not supported, only few people will be able to use healthy local foods.