ORIGINAL INVESTIGATION

Reactions to Framing of Cessation Messages: Insights From Dual-Smoker Couples

Isaac M. Lipkus PhD¹, Krista W. Ranby PhD², Megan A. Lewis PhD³, Benjamin Toll PhD^{4,5}

¹Duke University School of Nursing, Durham, NC; ²University of Colorado Denver, Denver, CO; ³Research Triangle Institute, Durham, NC; ⁴Yale University School of Medicine, New Haven, CT; ⁵Yale Cancer Center, Smilow Cancer Hospital at Yale-New Haven, New Haven, CT

Corresponding Author: Isaac M. Lipkus, PhD, Duke University School of Nursing, 307 Trent Drive, Box 3322, Durham, NC 27710. Telephone: 919-668-2348; Fax: 919-681-8899; E-mail: isaac.lipkus@duke.edu

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ABSTRACT

Introduction: Couples in which both members smoke (dual-smoker couples) have not been the explicit target of cessation interventions. Quit rates are lower and relapse rates are higher among individuals in dual-smoker couples. A potentially effective strategy to motivate dual-smoker couples to quit is to convey messages that highlight how the positive outcomes of quitting (gain frame) or the negative outcomes of continued smoking (loss frame) affect the couple rather than the individual smoker. We explored whether dual-smoker couples' smoking behaviors (e.g., amount smoked) and desire to quit would differ as a function of message frame (gain vs. loss) or outcome focus (individual vs. couple).

Methods: Dual-smoker couples ($N = 40$) completed a baseline survey and were then randomized to review gain- or loss-framed messages that varied whether the outcomes influenced the individual or the couple. Main outcomes were desire to quit after reading messages and smoking behaviors at a 1-month follow-up.

Results: Couple-focused messages produced the strongest desire to quit and decreased amount of cigarettes smoked at follow-up. The latter effect was mediated by desire to quit. Loss-framed messages produced inconsistent effects on desire to quit. There were no significant interactions between outcome focus and message framing.

Conclusions: Findings suggest that messages emphasizing how smoking affects both partners can motivate cessation among dual-smoker couples. Contrary to findings showing that gain-framed messages motivate cessation targeting individual smokers, results suggest that loss-framed messages may be more persuasive than gain-framed messages when the target of the outcome involves significant others.

INTRODUCTION

Couples in which both members smoke (i.e., dual-smoker couples) are a prevalent yet understudied group for smoking cessation interventions (Franks, Pienta, & Wray, 2002; Homish & Leonard, 2005; Kendrick et al., 1995; Osler & Prescott, 1998; Roski, Schmid, & Lando, 1996; Ruge et al., 2008). Quit rates are lower and relapse rates are higher among individuals in dual-smoker couples (Ferguson, Bauld, Chesterman, & Judge, 2005; Garvey, Bliss, Hitchcock, Heinold, & Rosner, 1992; Palmer, Baucom, & McBride, 2000). Yet, guidelines and evidence-based approaches lack specific couple-based cessation strategies or strategies that motivate individual smokers by appeals that raise the consequences of smoking for their partners. For this high-risk subgroup of smokers, family systems and interpersonal theories (Doherty & Whitehead, 1986; Lewis et al., 2006; Palmer et al., 2000; Rohrbaugh et al., 2001; Shoham, Rohrbaugh, Trost, & Muramoto, 2006) predict that

interventions highlighting shared, joint, or communal aspects of quitting may be more effective than interventions focused solely on individual smokers. Promoting a communal coping ("we") mindset may be crucial for optimizing motivation to quit when both partners in a couple smoke (Lyons, Mickelson, Sullivan, & Coyne, 1998). How best to achieve such a mindset with minimally intensive interventions has received virtually no attention in the cessation literature. Message framing may be one strategy that could promote a communal mindset.

Prospect theory postulates that individuals respond differently to factually equivalent messages depending on whether they emphasize benefits (gain framed) or costs (loss framed) (Tversky & Kahneman, 1981). For example, with regard to smoking cessation, "You will live longer if you quit smoking" is a gain-framed message, and "You will die sooner if you continue smoking" is a loss-framed message. According to Prospect theory, when gains are salient, people are risk averse; when losses are prominent, individuals are risk seeking. Thus,

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although the messages are factually equivalent, framing can influence an individual's willingness to incur risk, to encourage a desirable outcome, or to avoid an unwanted outcome (Tversky & Kahneman, 1981).

Based on Prospect theory, gain-framed messages should be more persuasive to promote behaviors that avert harm (e.g., skin cancer prevention, exercising), whereas loss-framed messages should be more effective to promote illness-detection behaviors (e.g., mammography, HIV testing) (Rothman & Salovey, 1997). Several meta-analyses exploring the interaction between type of frame and purpose of the behavior (i.e., preventive vs. detection) have not found interactions or effects for certain types of behaviors (e.g., flossing) (O'Keefe & Jensen, 2007, 2009). With respect to smoking cessation, one review found a slight advantage of gain- over loss-framed messages (Gallagher & Updegraff, 2012). However, the small effect size (mean $r = .198$, Gallagher & Updegraff, 2012) suggests the need to explore other factors that can increase the efficacy of message framing to promote cessation (Latimer, Salovey, & Rothman, 2007).

Prior studies testing effects of message framing on cessation have targeted individual smokers. Some findings show gain-framed messages are more effective at promoting short-term cessation (Toll et al., 2007, 2010). However, unknown is how framing might influence cessation when outcomes at issue concern both partners who smoke. For such couples, messages can highlight how the positive outcomes of quitting (gain frame) or the negative outcomes of continued smoking (loss frame) affect the individual smoker or the couple (i.e., individual- vs. couple-focused messages). Hence, one unexplored factor of framing effects is highlighting whether the outcomes of a behavior (e.g., smoking cessation) affect the individual or the couple. Gain-framed messages may promote smoking cessation equally or perhaps more potently when the outcome focus is on the couple rather than the individual smoker.

Messages targeting couple-level outcomes may be effective because they activate relational processes that mediate quitting, such as strengthening a communal mindset (Lewis et al., 2006; Rohrbaugh, Mehl, Shoham, Reilly, & Ewy, 2008), dyadic efficacy (Sterba et al., 2011), social support, and couple norms against smoking (Park, Schultz, Tudever, Campbell, & Becker, 2004; Westmaas, Bontemps-Jones, & Bauer, 2010). These messages may also reinforce intrapersonal mediators of message framing effects, such as perceived risk and worry, message elaboration, and self-efficacy (Gerend, Shepherd, & Monday, 2008; Maheswaran & Meyers-Levy, 1990; Moorman & van den Putte, 2008; Rothman, Martino, Bedell, Detweiler, & Salovey, 1999; Rothman & Salovey, 1997; Smith & Petty, 1996). Finding mediators of framing effects has been inconsistent (Rothman et al., 1999; Rothman & Salovey, 1997), perhaps due to the lack of attention as to how the social environment influences these mediators. Framing interventions that enhance both intra- and interpersonal mediators may achieve stronger effects in promoting quitting than are found among existing interventions.

Before tests of these mechanisms can occur with dual-smoker couples, it is important to establish—as we do here—that cessation messages are perceived as either gains or losses, and also judged as applicable to individual smokers or couples. Thus, this study explores dual-smoker couples' reactions (e.g., desire to quit, smoking behaviors) to manipulations that cross message framing with outcome focus (four conditions total). Outcome

focus refers to the effects that continuing to smoke or quitting have on the individual or the couple. We examine for the first time whether (a) gain-framed messages are more persuasive at increasing intentions to quit and lowering amount smoked, which both predict cessation (Hughes & Carpenter, 2005; Hyland et al., 2005; Peters & Hughes, 2009), than loss-framed messages when effects of smoking target the couple and (b) messages targeting couple-focused outcomes are more persuasive than messages targeting individual outcomes. We explored whether frame would interact with outcome focus—with the caveat that our study, due to small sample size, was underpowered for such a test. We tested the following main hypotheses:

- H1: Gain-framed messages, more than loss-framed messages, would increase desire to quit and reduce amount of cigarettes smoked.
- H2: Couple-focus messages, more than individual-focused messages, would increase desire to quit and reduce amount of cigarettes smoked.

METHODS

Procedures

Couples in central North Carolina were recruited using newspaper and web-based advertisements (e.g., Craigslist). Couple members had to be at least 18, have smoked at least 100 cigarettes in their lifetimes, smoke at least 1 cigarette/day, report being married or in a committed relationship with their partner for at least 6 months, and be able to read and write English. Smokers did not need to express desire to reduce or quit smoking. Individuals who responded to our advertisements were screened by a trained research assistant for eligibility. If one couple member was found eligible, permission was asked to contact the partner to assess eligibility. If both partners were eligible, they each provided verbal consent over the phone and separately took part in a baseline phone interview. After the baseline interview, couples were scheduled to come to the Duke Risk Communication Laboratory, typically within 2 weeks, for an in-person session.

In-Person Session

Study procedures were reviewed and written informed consent was obtained. After first completing a battery of individual difference measures and participating in an audiotaped discussion of their views of smoking, couples as a unit were randomized to one of four conditions, using a 2 (frame: gain/loss) by 2 (outcome focus: individual/couple) factorial design. Overall, 40 couples were randomized: 11 couple/gain, 10 couple/loss, 9 individual/gain, and 10 individual/loss. Both couple members were assigned to the same condition and received identical materials.

In a separate room, each partner reviewed scenarios that varied along the manipulated dimensions that highlighted separately the following themes: health, finances, physical appearance, and secondhand smoke. These themes stemmed, in part, from evaluations of an earlier pilot study in which 16 couples were asked to talk about positive and negative consequences of quitting or not quitting. Examples of scenarios by condition for the theme of health are provided in the [Supplementary Materials](#). Immediately after reviewing the

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scenarios, participants in private evaluated the scenarios and then completed additional measures (see below). Participants completed a 1-month follow-up phone survey individually. Each member was paid \$10 for the baseline interview, \$20 for the in-person visit, and \$10 for the 1-month follow-up survey. The study was approved by the Duke Medical Center Institutional Review Board.

Measures

In addition to obtaining data on demographics, smoking history and patterns, length of the relationship, and relationship closeness (Aron, Aron, & Smollan, 1992), the following measures were collected at one or more of three timepoints: baseline, in-person session, and 1-month follow-up.

Desire to Quit

At baseline and during the in-person session, participants rated their *global* desire to quit on a 7-point Likert scale from 1 (*not at all strong*) to 7 (*extremely strong*). Further, they were asked to rate the strength of their desire that their partner quit from 1 (*not at all strong*) to 7 (*extremely strong*). Participants were asked to indicate to what extent the *scenarios* affected their own desire to quit (0 = *decreases my desire* to 10 = *increases my desire*), as well as their desire to quit for the well-being of their spouse/partner using the same 11-point Likert scale.

Stage of Change

Participants were asked whether they were seriously thinking of quitting smoking during the next 6 months (no/yes). Those who marked “yes” were asked whether they were planning to quit during the next 30 days (no/yes). Participants were categorized into one of three stages: precontemplation (no plans to quit in next 6 months), contemplation (plans to quit in next 6 months but not next 30 days), and preparation (plans to quit in next 30 days).

Behavioral Outcomes

At follow-up, participants were asked whether or not they “had seriously tried to stop smoking for at least 24 hr within the last month,” whether they “smoked a cigarette, even a puff, in the last 7 days,” and “within the last week, on average, how many cigarettes did you smoke in a day?” The average number of daily cigarettes smoked was also assessed at baseline.

Manipulation Checks

As a manipulation check for message framing, after reading scenarios participants were asked, “Overall, the scenarios conveyed information about... 0 = advantages of *not* smoking to 10 = the disadvantages of *continuing* to smoke.” As a manipulation check for outcome focus, participants were asked, “Overall, the scenarios stressed the effects of smoking on... 0 = individuals who smoke to 10 = couples who smoke.”

Statistical Analyses

Main effects of message frame (gain vs. loss), outcome focus (couple vs. individual), and interaction effects of the two factors were examined for the manipulation checks, desire to quit smoking, and smoking behavior. Because the study involved couples, nonindependence of observations was accounted for in analyses. Analyses were run using SPSS Mixed with

individuals nested within couples, following methods suggested by Kenny, Kashy, and Cook (2006). In these models, effects are estimated at the individual level but standard errors are corrected for clustering at the dyad level. Individual level means are reported. Mediation analyses were conducted using Mplus 6.12 within a structural equation modeling framework, also accounting for nonindependence through the estimation of individual-level models, which corrected standard errors based on the nonindependence of partners within couples.

For all analyses, we tested effects with the inclusion of the outcome variable measured at baseline as a covariate (e.g., testing effect of frame and outcome focus on desire to quit controlling for its baseline value). Inclusion of the covariate did not change results significantly. For analyses involving number of cigarettes smoked, methods allowing for the specification of a Poisson distribution of the dependent variable were attempted but failed to properly converge, possibly due to small sample size. Further, the presence of zeros within the distribution is problematic when treating count variables as continuous; however, baseline measure of cigarettes smoked contained no zeros, and at follow-up only two participants reported smoking no cigarettes. Thus, results for cigarettes smoked are reported from tests that assume a normal distribution.

RESULTS

Sample Characteristics

Overall, 109 individuals responded to advertisements of which 48 couples were deemed eligible and consented; 47 completed the baseline survey and 40 attended the in-person session. There were no differences between participants who attended the in-person session and those lost after baseline on age ($F_{(1, 45)} = 0.49, ns$), race (% Black; $F_{(1, 45)} = 0.16, ns$), number of daily cigarettes smoked ($F_{(1, 45)} = 0.39, ns$), stage of change ($F_{(1, 45)} = 1.12, ns$), or desire to quit ($F_{(1, 45)} = 1.39, ns$). Characteristics of the individual participants and couples are presented in Table 1. Overall, 72 of the 80 individuals (36 complete couples) completed a follow-up survey 1 month after their in-person session.

Group Equivalence Following Random Assignment

We tested whether groups differed by condition on baseline desire to quit and number of cigarettes smoked using SPSS Mixed to appropriately address dyadic data. Message frame, outcome focus, and their interaction were included as predictors of own desire to quit and amount smoked. No significant effects were observed for desire to quit (message frame, $F_{(1, 36)} = 0.37, ns$; outcome focus, $F_{(1, 36)} = 3.2, ns$; interaction term, $F_{(1, 36)} = 0.01, ns$) or number of cigarettes smoked (message frame, $F_{(1, 36)} = 0.03, ns$; outcome focus, $F_{(1, 36)} = 0.58, ns$; interaction term, $F_{(1, 36)} = 0.39, ns$). Further, there were no significant baseline differences by conditions for stage of change, age, or race.

Manipulation Checks

Manipulations of message framing and outcome focus were successful. Participants who received the loss-framed scenarios rated them as portraying the disadvantages of continued smoking more so than participants who received the gain-framed

Table 1. Demographic Characteristics and Smoking Profile at the Couple Level ($N = 40$ Couples)

Variable	Mean (SD) or percent	Range
Age (mean, SD)	42.2 (10.2)	21–66
Race		
Black	48%	
White	23%	
Mixed	28%	
Years smoked (mean, SD)	23.3 (9.2)	4–49
Average cigarettes/day (mean, SD)	15.9 (7.9)	3–50
Stage of change (%)		
Matched stages	(21/40) 52.5%	
Precontemplation	(3/21) 14.3%	
Contemplation	(10/21) 47.6%	
Preparation	(8/21) 38.1%	
Mismatched stages	(19/40) 47.5%	
Precontemplation/contemplation	(7/19) 36.8%	
Contemplation/preparation	(7/19) 36.8%	
Precontemplation/preparation	(5/19) 26.3%	
Ever tried to quit with partner (%) ^a	28%	
Married (%)	33%	
Length of relationship	6.5 years (6.5)	6 months–25 years
Relationship closeness at posttest	5.8 ($SD = 1.5$)	1–7

Note. ^a25% of couples disagreed as to whether they ever tried to quit with partner.

scenarios (loss framed, $M = 8.2$, $SD = 3.1$; gain framed, $M = 4.4$, $SD = 3.6$; $F_{(1, 37.5)} = 23.7$, $p < .001$). Participants who received scenarios that focused on how smoking affected couple outcomes rated them as couple focused more so than participants who received individual-oriented outcome scenarios (couple focus, $M = 8.1$, $SD = 2.4$; individual focus, $M = 4.5$, $SD = 3.0$; $F_{(1, 36.6)} = 23.5$, $p < .001$).

Effects on Desire to Quit

Table 2 presents results on the four measures of desire to quit. We first tested for interactions between message frame and outcome focus on these outcomes. No interactions were found (p values .358 to .896). We also tested whether relationship closeness would moderate effects of frame, outcome focus, and their combination on these outcomes. No interactions were found (p values .235 to .906). We predicted that gain-framed messages would produce a stronger desire for self and partner to quit than would loss-framed messages. We also predicted that messages that focused on couple outcomes would produce a stronger desire for self and partner to quit than would messages that focused on individual outcomes. We did not find a significant effect for message frame ($F_{(1, 37.2)} = 0.162$, $p = .69$) but did find support for our hypothesis concerning outcome focus ($F_{(1, 37.2)} = 7.9$, $p < .01$) such that participants who read couple-focused scenarios expressed a stronger desire to quit than participants who read the individual-focused scenarios (couple focus, $M = 5.8$, $SD = 1.2$; individual focus, $M = 4.7$, $SD = 1.9$). Desire for partner to quit was not affected by either message frame or outcome focus.

Results differed when participants were asked to consider specifically how the scenarios influenced their own desire to quit (see Table 2). There was a significant main effect for framing ($F_{(1, 35.7)} = 7.0$, $p < .05$) but no significant main effect of outcome focus ($F_{(1, 35.8)} = 2.0$, $p = .168$). Contrary to our hypothesis, participants in the loss-framed condition reported

that the scenarios increased their desire to quit more than participants in the gain-framed condition (loss frame, $M = 9.0$, $SD = 1.4$; gain frame, $M = 7.6$, $SD = 2.5$). For ratings of how the scenarios affected their desire to quit for the well-being of the partner, there were main effects for both frame ($F_{(1, 32.5)} = 5.2$, $p < .05$) and outcome focus ($F_{(1, 32.6)} = 4.3$, $p < .05$). Desire to quit for the well-being of the partner was higher when participants read loss- rather than gain-framed scenarios (loss frame, $M = 9.2$, $SD = 1.2$; gain frame, $M = 8.3$, $SD = 1.9$) and when they read scenarios that focused outcomes on the couple rather than the individual (couple focus, $M = 9.1$, $SD = 1.4$; individual focus, $M = 8.3$, $SD = 1.7$).

Effects on Smoking Behavior at 1-Month Follow-up

We first tested for an interaction effect between message frame and outcome focus on change in amount smoked from baseline to 1-month follow-up. This interaction effect was not statistically significant ($F_{(1, 31.7)} = 0.30$, $p = .589$). Means and standard deviations of amount smoked at the 1-month follow-up for each of the four conditions are provided in Table 2.

A main effect of outcome focus was observed on average number of daily cigarettes smoked while controlling for baseline levels ($F_{(1, 32.2)} = 4.51$, $p < .05$). Participants in the couple-focused outcome condition reported fewer daily cigarettes than did people in the individual-focused outcome condition (couple focus, $M = 7.8$, $SD = 6.6$; individual focus, $M = 12.0$, $SD = 10.5$). Message frame did not have an effect on number of cigarettes smoked at follow-up ($F_{(1, 32.2)} = 1.05$, ns). Using mixed effects logistic regression models, no effects of message frame or outcome focus were observed for remaining abstinent for at least 24 hr in past month (39%, 28/71 reported this behavior) or refraining from smoking in the past 7 days (4%, 3/71 reported this behavior).

Mediation analyses tested whether global desire to quit following review of the scenarios mediated the effect of the outcome focus condition on number of cigarettes smoked at

Table 2. Effects of Frame and Outcome Focus on Desire to Quit Measures at Posttest and Smoking at 1-Month Follow-up

Outcome	Gain frame		Lost frame	
	Individual	Couple	Individual	Couple
Desire to quit for self (global)	4.8 (2.1)	5.6 (1.3)	4.6 (1.9)	6.1 (1.3)
Desire that partner quit (global)	5.2 (2.0)	5.4 (2.0)	5.1 (1.9)	6.0 (1.6)
Desire to quit for self as affected by scenario	6.9 (2.4)	8.1 (2.5)	8.9 (1.6)	9.1 (1.3)
Desire that partner quit as affected by scenario	7.8 (1.9)	8.7 (1.8)	8.8 (1.5)	9.5 (0.8)
Number of cigarettes smoked on average per day	14.5 (13.8)	7.9 (7.6)	9.8 (5.9)	7.7 (5.4)

Note. Numbers in parentheses are the standard deviations. For global measures scores ranged from 1 to 7; scores ranged from 0 to 10 on measures conditional on scenario. Higher numbers reflect a greater desire to quit for self or partner.

follow-up, controlling for baseline number of cigarettes smoked and clustering at the couple level. The estimate of the overall effect of outcome focus on cigarettes smoked at follow-up was significant ($std\ b = -0.19$, $SE = 0.09$, $p < .05$). When post-scenario desire to quit was added to the model, outcome focus was a significant predictor of desire to quit ($std\ b = 0.33$, $SE = 0.10$, $p < .001$); desire to quit was a significant predictor of cigarettes smoked ($std\ b = -0.31$, $SE = 0.07$, $p < .001$); and outcome focus was no longer a significant predictor of cigarettes smoked ($std\ b = -0.09$, $SE = 0.08$, $p = .26$, *ns*). Further, the estimate of the indirect effect of outcome focus on cigarettes smoked through desire to quit immediately following the manipulation was significant ($std\ b = -0.10$, $SE = 0.04$, $p < .01$). This model fit the data well ($\chi^2_{(1)} = 0.18$, *ns*; comparative fit index = 1.00; standardized root mean square residual [SRMR] = 0.02). Further, 95% asymmetric confidence limits around the unstandardized estimate of the indirect effect were computed using PRODCLIN (MacKinnon, Fritz, Williams, & Lockwood, 2007), resulting in confidence limits around the mediated effect of 0.604 of 0.158 to 1.182. Results support our mediation hypothesis regarding own desire to quit. Overall, this model explained a large proportion of variance in cigarettes smoked at follow-up ($R^2 = .49$). Other than the global measure of desire to quit for self, none of the other measures of desire to quit served as indirect mediators of amount of cigarettes smoked.

DISCUSSION

This is the first study to explore how message framing that focuses on individual- versus couple-focused outcomes are perceived by dual-smoker couples. A unique and main finding is that participants who read messages that focused on couple rather than individual outcomes reduced the number of cigarettes they smoked from baseline to follow-up. This effect was mediated by an increase in their global desire to quit. These results are important because decreasing the number of cigarettes smoked is an important step toward achieving cessation (Carpenter, Hughes, Solomon, & Callas, 2004; Hughes & Carpenter, 2005; Hyland et al., 2005). These findings suggest future exploration and replications are warranted, testing messages focusing on effects of smoking on the couple. It is less clear whether messages should be gain framed or loss framed; however, as shown in Table 2, couple-focused loss-framed messages had consistently the highest means on the measures of desire to quit and fewest number of cigarettes smoked. That said, it is premature to recommend specific combinations of

conditions, especially given inconsistent framing effects and lack of interactions.

Message framing produced inconsistent effects. Global measures of desire to quit for self and partner were not influenced by framing, whereas measures focused on how scenarios affected desire to quit found that loss-framed messages increased desire to quit for self and partner. Although it is possible that message framing does not produce consistent effects in general, there are several possible explanations for the present findings. Indeed, several reasons exist why loss framing may have been more persuasive. Unlike the loss-framed scenarios, participants did not rate the gain-framed messages on the extreme end of positivity (a rating of 4.4 with 0 = *advantages of not smoking* and 10 = *disadvantages of continuing to smoke*). The less extreme ratings of positivity may be a function of participants' lower general desire to quit smoking at baseline (i.e., approximately two thirds of the sample were either precontemplators or contemplators). It is possible that the negative aspects of continued smoking were more salient for this sample of smokers who were not motivated to quit.

Findings from message framing studies for vaccinations may point to reasons why loss-framed messages were more persuasive. A growing body of evidence shows that loss-framed messages are more effective—particularly in certain racial groups—when it comes to the well-being of others, such as the promotion of mothers' intentions to vaccinate their children (Abhyankar, O'Connor, & Lawton, 2008; Lechuga, Swain, & Weinhardt, 2011). For instance, in a study on mothers' decisions involving whether to obtain the measles, mumps, and rubella (MMR) vaccination for their children, Abhyankar et al. (2008) found that a loss-framed message increased intentions to obtain the MMR vaccine. As such findings suggest, loss-framed messages may be more persuasive when influencing intentions to engage in prevention behaviors for a family member, analogous to our result, which revealed that loss-framed messages were more persuasive than gain-framed messages when rating desire to engage in behavior for the partner's well-being. Indeed, people who have happy relationships with their partners may be more sensitive to factors that threaten the well-being of the relationship. Assuming so (most of our couples rated their relationships as close) might explain the superiority of the loss-framed scenarios to influence desire to quit on some measures—relationship closeness did not moderate any of our main findings.

This study has several limitations. First, the number of couples who participated is small. Hence, we were underpowered to detect small effects and interactions. Second, whether the findings generalize to the larger population of

dual-smoker couples are unknown, as our sample was recruited via community advertisement. Third, it would be worthwhile to explore whether the development and application of gain-framed messages that are rated with greater positivity change our findings. However, it is clear that our participants viewed the gain- and loss-framed messages differently on this dimension.

In summary, members of dual-smoker couples expressed a stronger desire to quit and smoked less at follow-up when messages were couple focused; message framing had inconsistent effects. Future message framing studies could consider extending the paradigm to outcomes that focus on the effects smoking has on couples. These findings merit replication with larger samples to more powerfully test the present hypotheses along with mediators and moderators to better understand processes underlying smoking cessation within dual-smoker couples, a high-risk, yet understudied group.

SUPPLEMENTARY MATERIAL

Supplementary Material can be found online at <http://www.ntr.oxfordjournals.org>

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DECLARATION OF INTERESTS

None declared.

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