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A Test of The Risk Perception Attitude Framework as a Message Tailoring Strategy to Promote Diabetes Screening

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ABSTRACT

The risk perception attitude (RPA) framework was tested as a message tailoring strategy to encourage diabetes screening. Participants (N = 602) were first categorized into one of four RPA groups based on their diabetes risk and efficacy perceptions and then randomly assigned to receive a message that matched their RPA, mismatched their RPA, or a control message. Participants receiving a matched message reported greater intentions to engage in self-protective behavior than participants who received a mismatched message or the control message. The results also showed differences in attitudes and behavioral intentions across the four RPA groups. Participants in the responsive group had more positive attitudes toward diabetes screening than the other three groups, whereas participants in the indifferent group reported the weakest intentions to engage in self-protective behavior.

Risk and efficacy are central factors motivating health behavior (Bandura, 1977; Rimal & Real, 2003; Rosenstock, 1974; Witte, 1992). Whereas risk perceptions involve the severity of a threat and one's susceptibility to it, efficacy perceptions focus on one's ability to take self-protective actions and the effectiveness of those behaviors. The risk perception attitude (RPA) framework is one theory designed to explain the health-related effects of risk and efficacy (Rimal & Real, 2003). The central proposition of the RPA framework is that efficacy beliefs moderate the effects of perceived risk on self-protection motivation. People are most motivated to engage in self-protective actions when they perceive high levels of both risk and efficacy.

Although several studies have been conducted to test the RPA framework, most have focused on examining differences in health behaviors among people with distinct risk and efficacy perceptions (Pask & Rawlins, 2016; Rimal, Böse, Brown, Mkandawire, & Folda, 2009; Rimal et al., 2009; Rimal & Juon, 2010; Sullivan, Beckjord, Finney Rutten, & Hesse, 2008; Turner, Rimal, Morrison, & Kim, 2006). Despite the value of such research, the utility of the RPA framework (Rimal & Real, 2003) as a means to change health attitudes and behavioral intentions warrants greater consideration. The RPA framework has tremendous potential as a strategy for message tailoring (Rimal et al., 2009). Message tailoring involves directing a particular message to a specific individual based on previously acquired information unique to the individual (Kreuter, Strecher, & Glassman, 1999). In a meta-analytic review (Noar, Benac, & Harris, 2007), tailored messages were more effective than untailored messages in promoting health attitude and behavior change—particularly when the tailoring was theory-based.

The purpose of this study is to examine the RPA framework (Rimal & Real, 2003) as a theoretical approach for message tailoring to promote positive attitudes toward diabetes screening and intentions to engage in self-protective behaviors related to diabetes prevention. Type 2 diabetes presents a novel and pressing challenge for health communication scholars. More than 86 million Americans are estimated to have prediabetes (fasting glucose of 100–124 mg/dL, or HbA1c of 5.7–6.4% [American Diabetes Association, 2016]), yet 90% are unaware of their risk (US Centers for Disease Control and Prevention, 2014, 2017). Although promoting screening for diabetes risk has the potential to significantly impact public health, a blood test is required to confirm risk and refer patients to prevention programs. Despite the availability of opportunities for blood testing (e.g., testing facilities include a family doctor, local pharmacy, walk-in clinic, etc.), several significant barriers to widespread screening and risk-reduction behaviors remain. Focusing on Type 2 diabetes thus offers a novel and valuable context to evaluate the RPA framework (Rimal & Real, 2003) as a message tailoring strategy. In the following sections, we first provide background information about the RPA framework and then discuss its potential a strategy for message tailoring to promote diabetes screening.

Literature review

Background on the RPA framework

The RPA framework is founded on the notion that perceptions of risk and efficacy are central factors determining whether or not individuals engage in protective health

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behavior (Rimal & Real, 2003). Four distinct attitudinal groups are identified in the RPA framework based on different combinations of risk and efficacy perceptions. The *responsive* group consists of individuals who perceive high levels of risk and efficacy regarding a specific health threat. Because they perceive the threat to be salient but also believe they can effectively cope with it, this group is most motivated to engage in self-protective behavior. The *indifferent* group perceives low levels of risk and efficacy. This group is least motivated to engage in self-protective behavior, because they do not perceive themselves to be at risk and do not believe that the risk could be mitigated. The *avoidant* group includes people who perceive high risk and low efficacy. These individuals are less likely than those with a responsive attitude to engage in self-protective health behaviors, as they do not feel that they can adequately cope with the threat. The *proactive* group includes individuals who perceive low levels of risk but high levels of efficacy. Although these individuals do not feel a great deal of risk, they believe that there are effective steps to mitigate the threat.

Research applying the RPA framework (Rimal & Real, 2003) has focused on demonstrating differences in health perceptions or behaviors among the four groups. One general trend that has emerged in cross-sectional research is that responsive and proactive group members tend to report greater intentions to engage in self-protective health behavior than members of the indifferent and avoidant groups. Although there are exceptions (e.g., Pask & Rawlins, 2016), this basic trend has been observed across studies investigating health issues like HIV (Rimal et al., 2009, 2009), breast cancer (Rimal & Juon, 2010), cancer-related nutrition (Sullivan et al., 2008), and skin cancer (Rimal & Real, 2003, Study 2). Experimental research examining the RPA framework, however, has been less prevalent and the results less consistent. In two studies focused on skin cancer and diabetes, Turner et al. (2006) primed participants into one of the four RPA groups and found that intentions to engage in self-protective behavior were the greatest in the responsive group and weakest in the indifferent group. The proactive and avoidant groups were different from the two previous groups but not different from one another. Rimal and Real (2003, Study 1) found that the avoidant group had significantly greater intentions to engage in skin cancer prevention behavior than the indifferent group. No other differences were observed in their study among the four RPA groups.

Evaluating the RPA framework as a message tailoring strategy

Message tailoring generally involves using previously collected information about an individual to construct a message that is specific to that person (Kreuter et al., 1999). Tailoring may be based on demographics like age, psychographic factors like attitudes and beliefs, or other types of information. The results from one meta-analysis offered evidence that tailoring is an effective strategy to promote health screening behaviors (Noar et al., 2007). Moreover, the same meta-analysis showed that tailoring based on health communication theory was more effective than tailoring based on prior behavior.

In order for the RPA framework to offer an effective message tailoring strategy, meaningful preexisting differences in self-protection motivation must exist among the four RPA groups. Because tailoring involves generating messages unique to a given audience segment (e.g., people with high risk and low efficacy perceptions), it is critical that those audience segments are sufficiently distinct (Noar, Harrington, & Aldrich, 2009). Although the potential value of the RPA as an audience segmentation strategy has been noted (Rimal et al., 2009) and previous research has shown systematic differences in intentions to perform a range of self-protective behaviors across the four RPA groups (Rimal et al., 2009, 2009; Rimal & Real, 2003; Sullivan et al., 2008; Turner et al., 2006), it is necessary to demonstrate such differences in this project. Following previous research, we expect differences in attitudes and intentions to engage in self-protective behavior related to diabetes across the four RPA groups. The responsive and proactive groups are expected to report more positive attitudes toward diabetes screening and greater intentions to engage in self-protective behavior than the indifferent or avoidant groups.

> Hypothesis 1 (H1): Differences exist among the four RPA groups in (a) diabetes screening attitudes and (b) intentions to engage in self-protective behavior. Participants in the responsive and proactive groups will report more positive attitudes and intentions than participants in the indifferent and avoidant groups.

The RPA framework is rooted in the notion that self-protective actions are most likely when both perceived risk and efficacy are high (Rimal & Real, 2003). Consequently, adopting the RPA framework as a tailoring strategy must involve matching a persuasive health message to each audience member based on her or his membership in one of the four RPA groups: responsive, proactive, avoidant, indifferent. Each message should address the specific risk and efficacy perceptions of the audience member with the goal of achieving high levels of perceived risk and efficacy. In practical terms, applying the RPA framework requires first identifying the RPA group to which an individual belongs based on his or her risk and efficacy perceptions. Distinct messages can then be delivered based on RPA group membership in an effort to promote high levels of risk and efficacy among all audience members.

If the RPA framework (Rimal & Real, 2003) is an effective message tailoring strategy, then attitudes about diabetes screening and intentions to engage in self-protective behavior should be most positive among people who receive a message matched to their respective RPA group. Matching occurs when the risk and efficacy information in a message corresponds to the risk and efficacy perceptions of a given RPA group—with the objective of increasing low levels of risk and efficacy and maintaining high levels of risk and efficacy. For example, members of the indifferent group (low preexisting risk and efficacy) should receive a message highlighting the threat and ways it can be addressed. Members of the proactive group (low preexisting risk and high efficacy), in contrast, should receive a message reinforcing efficacy yet also emphasizing the threat. Matched RPA messages—which attempt to raise low risk and efficacy perceptions and maintain high risk and efficacy

perceptions—should be most effective in promoting positive attitudes and behavioral intentions.

In order to evaluate the effects of tailoring messages using the RPA framework (Rimal & Real, 2003), two comparison groups were included in this study. A mismatched condition was included in which the message presented to a given RPA group was the opposite of what would be advocated in the RPA framework. Mismatched messages underscore the threat or what could be done about it when preexisting risk and efficacy perceptions are high and do not extensively address these issues when risk and efficacy perceptions are low. Mismatching should undermine the high level of perceived risk and efficacy necessary for self-protection motivation. A second comparison group was also included where participants read a general message about the history of diabetes. This control condition provided a baseline for evaluating participants' attitudes toward diabetes screening and intentions to engage in self-protective behavior.

H2: A message tailored to participants' RPA will be more effective than a mismatched message or a control message in promoting (a) positive attitudes toward diabetes screening and (b) intentions to engage in self-protective behavior related to diabetes.

Method

Participants

Participants were recruited from a panel maintained by the survey firm Qualtrics. Participation was limited to adults 18 years and older living in the United States. Of the 619 participants, 17 completed the study in less than half of the median time of 635 seconds. In order to ensure the quality of participants' responses, these 17 cases were removed from the dataset. The remaining 602 participants were included in the analyses.

Males and females were almost evenly represented in the sample (female = 53%; male = 47%). On average, participants were 45.84 years old (SD = 16.28 years). Half of the sample identified primarily as White (50%), with the remaining participants identifying as Black or African American (13%), Hispanic or Latino (13%), Asian American (13%), and American Indian or Alaskan Native (13%). Approximately one-third of the participants (35%) reported having earned a bachelor's degree or greater education. Half of the participants (50%) reported a household income of less than $50,000 during 2016.

Design

The message tailoring variable had three conditions. Participants were randomly assigned to receive a message advocating a formal blood test to detect diabetes risk that matched their existing RPA (n = 193), mismatched their existing RPA (n = 197), or to a control message about the history of diabetes (n = 202). Participants' RPA group membership was determined by their responses to single-item measures of diabetes risk and efficacy (described in the measures section) that preceded the tailoring manipulation. Participants were segmented into one of the four RPA groups based on whether their perceived risk and efficacy scores fell above or below the scale midpoint: *responsive* (high risk/high efficacy; n = 159), *proactive* (high efficacy/low risk; n = 203), *avoidant* (high risk/low efficacy; n = 106), and *indifferent* (low risk/low efficacy; n = 133).

Procedure

Participants were randomly assigned to one of the three message tailoring conditions. In all conditions, participants first completed a seven-item diabetes risk assessment quiz (Bang et al., 2009). The assessment was developed to identify people at risk for diabetes (a formal diagnosis can only be accomplished with a blood test). Included with the assessment quiz were two additional items that asked participants to report their perceived risk of developing diabetes and their efficacy to cope with diabetes. Responses to these two items were used to identify a given participant's RPA group and to determine the specific message participants received in the tailoring manipulation.

The matched and mismatched messages informed participants that their quiz score indicated that they were susceptible to prediabetes. As previously noted, most of the 86 million Americans who are estimated to have prediabetes are unaware of their risk (Centers for Disease Control and Prevention, 2014, 2017). The remainder of the message addressed diabetes risk and efficacy and was tailored to match or mismatch the participant's respective RPA group. The same messages were used in the matched message condition as in the mismatched message condition, except they were targeted to different RPA groups. The RPA framework assumes that people who feel high levels of risk and efficacy will be most motivated to engage in self-protective behavior (Rimal & Real, 2003). Accordingly, matched messages were designed to reinforce high levels of risk and/or efficacy and raise low levels of risk and/or efficacy, depending on the RPA group. Mismatched messages were designed to reinforce low levels of risk and/or efficacy and raise high levels of risk and/or efficacy, depending on the RPA group.

The matched and mismatched messages for each of the four RPA groups can be found in Table 1. All messages in these two conditions concluded with a directive to acquire a formal blood test to detect prediabetes.

Participants in the control condition read a message about the history of diabetes research. It detailed the discovery of diabetes and major figures (e.g., Elliot Joslin, Frederick Banting) in the development of medical advances related to diabetes. The messages used in each of the three conditions ranged between 161 and 165 words. After reading their respective message, participants in all conditions completed a questionnaire containing measures of the dependent variables. All participants were thoroughly debriefed at the conclusion of the study and informed of their actual diabetes risk score. Participants were presented with information about how to interpret their score and pointed to additional high-

Table 1. Message matching manipulation for the four RPA groups.

Responsive attitude: High risk/High efficacy Matched message: Your answers to the screener quiz indicate that you are at risk for prediabetes. We suspect that you already are aware of that. You may also be aware that prediabetes is a serious condition that can lead to Type 2 diabetes. That is, you understand that you are vulnerable to prediabetes and that is a serious threat. The good news—which we suspect that you know—is that you have the ability to do something about prediabetes. There are lifestyle changes you can make to slow or even reverse prediabetes. You understand that there are things that can reduce your risk and that you have the ability to do them. Mismatched message: Your answers to the screener quiz indicate that you are at risk for prediabetes. You may not know it but prediabetes is a serious condition. If you have prediabetes it means that the long-term damage to your heart, blood vessels, and kidneys may already be starting. Prediabetes can easily turn into Type 2 diabetes. You also may not be aware that prediabetes can be reversed. There a number of simple things you can do starting today to reduce your risk. Eating vegetables, fruits, and whole grains, cutting out sugary drinks, processed and fast foods, increasing physical activity, and losing weight can be beneficial. You have the ability to slow or reverse prediabetes.	**Avoidant attitude: High risk/Low efficacy** Matched message: Your answers to the screener quiz indicate that you are at risk for prediabetes. We suspect that you already know that. You may also know that prediabetes is a serious condition that can lead to Type 2 diabetes. However, you may not be aware that prediabetes can be reversed. There a number of simple things you can do starting today to reduce your risk. Eating vegetables, fruits, and whole grains, cutting out sugary drinks, processed and fast foods, increasing physical activity, and losing weight can be beneficial. There are also online and community-based organizations that can help you find strategies that best work with your lifestyle. You have the ability to slow or reverse prediabetes. Mismatched message: Your answers to the screener quiz indicate that you are at risk for prediabetes. You may not know it but prediabetes is a serious condition. If you have prediabetes it means that the long-term damage to your heart, blood vessels, and kidneys may already be starting. Prediabetes can easily turn into Type 2 diabetes, which is a chronic disease with lasting and negative impacts. Without care, diabetes can increase the risk of blindness, nerve damage, kidney disease, heart disease, and stroke. The good news—which we suspect that you know—is that you have the ability to do something about prediabetes. There are lifestyle changes you can make to slow or even reverse prediabetes.
Proactive attitude: Low risk/High efficacy Matched message: Your answers to the screener quiz indicate that you are at risk for prediabetes. You may not know it but prediabetes is a serious condition. If you have prediabetes it means that the long-term damage to your heart, blood vessels, and kidneys may already be starting. Prediabetes can easily turn into Type 2 diabetes, which is a chronic disease with lasting and negative impacts. Without care, diabetes can increase the risk of blindness, nerve damage, kidney disease, heart disease, and stroke. The good news—which we suspect that you know—is that you have the ability to do something about prediabetes. There are lifestyle changes you can make to slow or even reverse prediabetes. Mismatched message: Your answers to the screener quiz indicate that you are at risk for prediabetes. We suspect that you already know that. You may also know that prediabetes is a serious condition that can lead to Type 2 diabetes. However, you may not be aware that prediabetes can be reversed. There a number of simple things you can do starting today to reduce your risk. Eating vegetables, fruits, and whole grains, cutting out sugary drinks, processed and fast foods, increasing physical activity, and losing weight can be beneficial. There are also online and community-based organizations that can help you find strategies that best work with your lifestyle. You have the ability to slow or reverse prediabetes.	**Indifferent attitude: Low risk/Low efficacy** Matched message: Your answers to the screener quiz indicate that you are at risk for prediabetes. You may not know it but prediabetes is a serious condition. If you have prediabetes it means that the long-term damage to your heart, blood vessels, and kidneys may already be starting. Prediabetes can easily turn into Type 2 diabetes. You also may not be aware that prediabetes can be reversed. There a number of simple things you can do starting today to reduce your risk. Eating vegetables, fruits, and whole grains, cutting out sugary drinks, processed and fast foods, increasing physical activity, and losing weight can be beneficial. You have the ability to slow or reverse prediabetes. Mismatched message: Your answers to the screener quiz indicate that you are at risk for prediabetes. We suspect that you already are aware of that. You may also be aware that prediabetes is a serious condition that can lead to Type 2 diabetes. That is, you understand that you are vulnerable to prediabetes and that is a serious threat. The good news—which we suspect that you know—is that you have the ability to do something about prediabetes. There are lifestyle changes you can make to slow or even reverse prediabetes. You understand that there are things that can reduce your risk and that you have the ability to do them.

quality resources about diabetes. The study procedure and measures were approved by the human subjects review board at the authors' university.

Measures

Attitude toward diabetes screening was evaluated with seven semantic differential items used in previous research (Dillard & Shen, 2005). Respondents were asked to report the degree to which they felt that getting a blood screening for prediabetes was good/bad, foolish/wise, unfavorable/favorable, negative/positive, undesirable/desirable, unnecessary/necessary, detrimental/beneficial. All ratings were made on a seven-point scale with larger values indicating more positive attitudes. A confirmatory factor analysis (CFA) was conducted on these seven items, $\chi^2(14) = 89.21$, $p < .001$, CFI = .984, SRMR = .025. The alternate fit indices suggest that the model sufficiently fit the sample data (Hu & Bentler, 1999). The mean of the seven items was computed and used to evaluate screening attitudes ($M = 6.14$, $SD = 1.19$, $\alpha = .91$)

Behavioral intentions were evaluated using five items adapted from previous research (Pask & Rawlins, 2016; Rimal & Real, 2003) that addressed participants' intentions to engage in self-protective behavior related to diabetes. Participants were asked to rate their intentions to implement the following behaviors: change their behavior to reduce their prediabetes risk, talk to their family and friends about prediabetes, talk to a medical professional about prediabetes, look for additional information about prediabetes risk, and have their blood tested by a medical professional. These items were rated on a seven-point Likert-type scale with larger values indicating greater intentions to engage in self-protective behavior. A CFA was conducted on this measure, and the model adequately fit the sample data, $\chi^2(5) = 57.21$, $p < .001$, CFI = .980, SRMR = .025. The mean of the five items was computed and used to measure intentions to engage in self-protective behavior related to diabetes ($M = 5.12$, $SD = 1.34$, $\alpha = .91$).

Diabetes risk and efficacy perceptions were evaluated using single-item measures completed *prior* to the message tailoring manipulation. Along with the diabetes risk assessment developed by Bang et al. (2009), participants were asked to report their perceived risk for prediabetes and confidence in their ability to reduce their risk. Both items were rated on seven-point Likert-type scales with larger values indicating greater perceived risk ($M = 4.00$ $SD = 1.88$) and efficacy ($M = 4.89$

SD = 1.62). As explained in the design and procedure sections, prediabetes risk and efficacy scores were used in determining the RPA group to which each participant belonged and served as the basis for the message tailoring manipulation.

Manipulation check. Two single-item measures were constructed for this study to evaluate the message matching manipulation. Participants were asked to rate their agreement that the message gave them very detailed information about some of the bad things that can be caused by prediabetes (e.g., damage to the heart, blood vessels, and kidneys; *M* = 4.71 *SD* = 1.78) or addressed specific things participants could do to reduce their risk of prediabetes (e.g., eating vegetables, cutting out sugary drinks, etc.; *M* = 4.67 *SD* = 1.90). Ratings were made on a seven-point Likert-type scale with larger values indicating greater levels of agreement.

Control variables. Two control variables were included in the analyses. First, participants were asked to report whether they had been previously diagnosed by a medical doctor with prediabetes or diabetes. A dichotomous variable was created to evaluate *previous diabetes diagnosis* with 1 indicating that a participant had been diagnosed (*n* = 113, 18.8%) and 0 indicating that they had not (*n* = 489, 81.2%). To account for the possibility that people who had previously been diagnosed with diabetes might respond differently to our messages, this factor was included as a control variable. The second control variable involved participants' score on the seven-item diabetes risk assessment developed by Bang et al. (2009). Although scores were not released to participants until the conclusion of the study, it seems possible that participants who were objectively at risk for diabetes (regardless of their perceived risk) might have responded differently than those who were not. Scores of 5 or greater on the assessment indicate that one is at risk for diabetes. Participants were assigned a dichotomous value representing their *objective diabetes risk* with 1 indicating that participants were at risk (*n* = 261, 43.4%) and 0 indicating that they were not at risk (*n* = 341, 56.6%). Notably, objective diabetes risk was only modestly correlated with participants' perceived diabetes risk, $r = .304$, $p < .001$.

Results

Preliminary analyses

Manipulation checks were conducted to evaluate the effectiveness of the message tailoring manipulation. Because the specific message participants received (within the matching and mismatching conditions) was contingent upon their RPA group, analysis of variance (ANOVA) was used to test the interaction between RPA group membership and tailoring condition for the manipulation check items. The interactions were significant for participants' reports that the message they read included detailed information about the negative effects of diabetes, $F(6, 597) = 10.054$, $p < .001$, $\eta^2 = .09$, and specific things they could do to reduce their risk of diabetes, $F(6, 597) = 15.517$, $p < .001$, $\eta^2 = .13$.

Post-hoc analyses were conducted using planned contrasts (Rosenthal & Rosnow, 1985). As expected, participants in the proactive and indifferent groups in the matching condition and the responsive and avoidant groups in the mismatching conditions were more likely to report that the message they received discussed the negative consequences of diabetes in detail than participants in the other eight groups/conditions, $F(1, 587) = 67.262$, $p < .001$, $\eta^2 = .10$. Similarly, participants in the avoidant and indifferent groups in the matching condition and the responsive and proactive groups in the mismatching conditions were more likely to report that the message they received included detailed information about things that can be done to reduce the risk of diabetes than participants in the other eight groups/conditions, $F(1, 588) = 96.652$, $p < .001$, $\eta^2 = .14$. These results indicate that the message tailoring manipulation was effective.

Comparing the four RPA groups

H1 predicted differences in the four RPA groups for (a) diabetes screening attitudes and (b) intentions to engage in self-protective behavior. Attitudes and intentions were expected to be most positive among members of the responsive and proactive groups and least positive among members of the avoidant and indifferent groups. Given the nature of the prediction made in H1, analysis of covariance (ANCOVA) was first used to test for an omnibus difference in the four RPA groups for the two dependent measures. Prior diabetes diagnosis and objective diabetes risk were included in the analyses as control variables. The ANCOVAs were statistically significant for both screening attitudes, $F(3, 600) = 5.225$, $p = .001$, $\eta^2 = .02$, and behavioral intentions, $F(3, 600) = 12.370$, $p < .001$, $\eta^2 = .05$.

An inspection of the mean scores for attitudes and behavioral intentions across the four groups, which can be found in Table 2, showed that they deviated from the predictions made in H1. Given this discrepancy, post-hoc pairwise comparisons were conducted to identify pairwise differences among the four RPA groups. The results showed that screening attitudes in the indifferent group were significantly lower than in the responsive, avoidant, and proactive groups. There were no other differences in attitudes among the other three RPA groups. These results partially supported H1a in that attitudes in the indifferent group were significantly different from the proactive and responsive groups.

For behavioral intentions, the responsive group scored significantly higher than the avoidant, indifferent, and proactive groups. The avoidant group also reported significantly greater behavioral intentions than the proactive group. There were no other differences in behavioral intentions. The results partially supported H1b. As expected, the responsive group reported significantly greater behavioral intentions than the avoidant or indifferent groups. Contrary to expectations, however, the avoidant group had significantly greater behavioral intentions than the proactive group.

The effects of message tailoring using the RPA

H2 predicted that a message tailored to match participants' RPA would be more effective than a mismatched message or a

Table 2. Means and standard errors for attitudes and intentions across the four RPA groups.

	Responsive: high risk/ high efficacy		Avoidant: high risk/ low efficacy		Proactive: low risk/ high efficacy		Indifferent: low risk/ low efficacy	
	M	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*
Screening attitude	6.30_b	.10	6.27_b	.11	6.16_b	.08	5.79_a	.10
Self-protective behavioral intentions	5.64_a	.10	5.15_b	.12	4.83_c	.09	4.93_{bc}	.11

Note. Means with different subscripts are significantly different ($p < .05$). Means and standard errors are adjusted for prior diabetes diagnosis and objective diabetes risk.

control message in promoting (a) positive attitudes toward diabetes screening and (b) intentions to engage in self-protective behavior. An ANCOVA controlling for prior diabetes diagnosis and objective diabetes risk showed that there was no omnibus difference among the three message tailoring conditions for attitudes, $F(2, 602) = 0.299$, $p = .742$, $\eta^2 < .01$. Moreover, the observed means for participants who received a matched message ($M = 6.09$, $SE = .08$), mismatched message ($M = 6.15$, $SE = .08$), and the control message ($M = 6.17$, $SE = .08$) were inconsistent with the prediction made in H2. The results do not support H2a.

A second ANCOVA controlling for diabetes diagnosis and objective diabetes risk showed an omnibus difference among the three message tailoring conditions for behavioral intentions, $F(2, 601) = 4.218$, $p = .015$, $\eta^2 = .01$. The observed means were consistent with the prediction that participants in the matched message condition ($M = 5.31$, $SE = .09$) had greater behavioral intentions than participants in the mismatched condition ($M = 5.14$, $SE = .09$) or the control condition ($M = 4.94$, $SE = .09$). To formally evaluate the ordered prediction made in H2, a planned contrast was conducted (Rosenthal & Rosnow, 1985). The matched group was assigned a contrast weight of +2 and the mismatched and control groups were each assigned contrast weights of −1. The planned contrast model, which controlled for diabetes diagnosis and objective risk, was statistically significant for behavioral intentions, $F(1, 597) = 6.794$, $p = .009$, $\eta^2 = .01$. These results supported H2b and indicated that participants who received a message that matched their RPA reported greater intentions to engage in self-protective behavior than participants who received a mismatched message or the control message.

Discussion

The primary objective of this project was to evaluate the RPA framework (Rimal & Real, 2003) as strategy for message tailoring. The results showed that intentions to engage in self-protective behavior were strongest in the condition where participants received a message matched to their RPA. The potential of the RPA framework as a tailoring strategy has been implied in previous research exploring the utility of this theory for audience segmentation (Rimal et al., 2009). The findings from this study show that tailoring messages to the respective risk and efficacy perceptions of an audience member with the aim of producing high levels of perceived risk and efficacy can be an efficacious strategy for promoting self-protective behavior.

It is fairly common to incorporate health communication theory into tailoring efforts. The range of theories employed, however, tends to be relatively limited. Noar et al.'s (2007) meta-analysis showed that most tailoring studies that relied on theory used the stages of change model, transtheoretical model, health belief model, or social cognitive theory. Beyond employing a novel theory in the RPA framework (Rimal & Real, 2003), this study is unique in that it brings to bear different operating mechanisms about why message tailoring works. Much of tailoring research assumes that message tailoring functions by increasing the perceived relevance of a message and encouraging message elaboration (Noar et al., 2009). Although relevance and elaboration may still play a role, message tailoring using the RPA framework also operates by attempting to achieve optimal risk and efficacy perceptions. The tailored messages in the matching condition were designed to account for an audience member's existing level of risk and efficacy (based on their RPA group) and ultimately promote high levels of perceived risk and efficacy about diabetes. Perceptions of risk and efficacy are integral to how and why the RPA framework operates as a tailoring strategy.

The results also revealed differences in the attitudes and behavioral intentions of the four RPA groups. Participants in the indifferent group (low risk/low efficacy) reported the least positive attitudes about diabetes screening. The responsive group (high risk/high efficacy) had significantly greater intentions to engage in self-protective behavior than the other three groups, and the avoidant group (high risk/low efficacy) reported significantly greater intentions than the proactive group (high efficacy/low risk). These findings deviate somewhat from the results of cross-sectional research in which the responsive and proactive groups tended to be more motivated to engage in self-protective behavior than the avoidant and indifferent groups (Rimal et al., 2009, 2009; Rimal & Juon, 2010; Rimal & Real, 2003; Study 2; Sullivan et al., 2008). The results from this study are, however, more consistent with the findings from experimental research. Turner et al. (2006), for example, found that the responsive group reported the greatest behavioral intentions and the indifferent group reported the weakest intentions. As a chronic condition that develops over a relatively long period of time, diabetes may be a context in which people who hold a responsive attitude are particularly motivated to act and people with an indifferent attitude are particularly unmotivated.

Although message tailoring using the RPA framework (Rimal & Real, 2003) impacted behavioral intentions, it did not influence participants' screening attitudes. Inspecting the mean scores for attitudes across the various conditions revealed that the results may be an artifact of a restriction in range for the attitude measure. Most participants reported extremely positive attitudes toward diabetes screening ($M = 6.14$, $SD = 1.19$). A more sensitive indicator of participants' attitudes may have made it possible to better capture the effects of message tailoring using the RPA framework.

Finally, in considering the findings from this study, it is worth noting that the sample included people with diabetes. Almost 20% of the participants reported having been diagnosed with diabetes by a medical doctor. One reason for including people with diabetes is that the central objective of

this project was testing the RPA framework (Rimal & Real, 2003) as a message tailoring strategy. If the RPA framework offers a robust strategy for message tailoring, then messages matched to participants' RPA group should be more effective in promoting positive attitudes and intentions than mismatched messages or a control message—regardless of whether or not participants have diabetes. Although objective diabetes risk and diagnosis status were included as control variables in the analyses, it is important to further consider the implications of these variables in this study. To this end, we removed participants who had been diagnosed with diabetes from the sample and re-conducted the analyses. The results were the same as with the full sample. We conducted another set of analyses limiting the sample to only those participants who were objectively at risk for diabetes but had not been formally diagnosed by a medical doctor. This group would presumably be the ideal target audience for a diabetes screening campaign. The results again followed the same trends as with the full sample. These additional analyses should assuage any concerns about the nature of the study sample and offer further evidence of the robustness of the RPA framework for message tailoring.

Conclusion

The purpose of this project was to evaluate the RPA framework (Rimal & Real, 2003) as a strategy for message tailoring to encourage diabetes screening. Our results offer some evidence to suggest that matching messages to audience members' RPA can be a valuable approach for promoting intentions to engage in self-protective behavior. For message designers, this would involve conducting formative research to identify the risk and efficacy perceptions of audience members and delivering tailored messages to each of the RPA groups. Despite the promising outcomes of this study, additional research is essential to further examine the implications of the RPA framework as a message tailoring approach and, more broadly, advance efforts to help address the growing challenge of Type 2 diabetes. With 86 million Americans estimated to be at increased risk of Type 2 diabetes and most unaware of their risk (Centers for Disease Control and Prevention, 2014, 2017), it is incumbent on health communication scholars to develop novel strategies to reach this group.

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