Published in final edited form as:

J Health Psychol. 2013 April ; 18(4): 470–476. doi:10.1177/1359105312445798.

Examining the use of message tailoring to promote physical activity among medically underserved adults

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Abstract

The purpose of this study was to examine if messages tailored to an individual's regulatory focus (i.e. their tendency to focus on prevention or promotion) increased exercise intentions and behavior in a medically underserved sample. Adult English as a Second Language students ($N = 58$) were presented with tailored exercise messages. There was a significant main effect for message type; participants who received promotion messages reported greater exercise intentions than those who received prevention messages. Intentions and behavior were not higher among those who received messages matching their regulatory focus. Implications for message tailoring frameworks are discussed.

Keywords

Hispanic; medically underserved; physical activity; regulatory focus

The Hispanic population in the United States comprises 16% of the total population and constitutes the largest and fastest growing minority group (US Census Bureau, 2010). Hispanics are more likely to be medically underserved than non-Hispanics (Centers for Disease Control and Prevention (CDC), 2004), with nearly 31% lacking health insurance coverage (US Census Bureau, 2010). Addressing health disparities among this population is a significant public health challenge, especially as the number of Hispanics living in the USA is expected to double by mid-century (CDC, 2004).

One promising approach to addressing health disparities among medically underserved Hispanics is community-based health promotion interventions that use message tailoring techniques to encourage prevention (physical activity, fruit and vegetable consumption) and detection (screening) behaviors (Martinez et al., 2012). Tailored messages include health information that is made to suit individual-level psychological characteristics such as motivational orientation or cognitive processing style. In this article, we describe a message tailoring experiment in a limited-literacy, medically underserved sample of Hispanic adults.

Tailoring messages to psychological characteristics is an effective way to promote healthy lifestyle behaviors (e.g. Latimer et al., 2005). For example, women increased their

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Competing Interests

None declared.

mammography utilization when they received messages tailored to their health locus of control (Williams-Piehot et al., 2004) or their coping style (Williams-Piehot et al., 2005). In both studies, women receiving messages consistent with their cognitive processing style (i.e. 'matched messages') were more likely to obtain a mammogram 6 and 12 months post-baseline than women who received mismatched messages.

Tailoring messages to motivational orientation may be another promising approach to health messaging interventions. Regulatory focus (RF) theory posits that individuals have a dominant motivational orientation when approaching goal-directed behaviors that is either promotion or prevention oriented (Higgins, 2000). 'Promoters' are motivated by the prospect of *achieving* desired outcomes and subsequently orient their behavior around advancement and accomplishment. 'Preventers' are motivated by the prospect of *avoiding* undesired or unpleasant outcomes and thus approach their goal by addressing their safety and security concerns. Laboratory-based studies show that individuals 'feel right' about their behaviors (i.e. experience regulatory fit) when thinking about or utilizing behavioral strategies that match their RF (e.g. Cesario et al., 2004; Spiegel et al., 2004). Similar findings emerged in field settings with behaviors such as physical activity and fruit and vegetable consumption. For example, messages tailored to RF led to more positive feelings about and greater engagement in physical activity (Latimer et al., 2008a) and fruit and vegetable consumption (Latimer et al., 2008b). Much of this work has involved predominantly White, female participants.

For the current study we recruited a medically underserved, limited-literacy population in a community-based setting to test the effectiveness of messages encouraging exercise that were tailored to individuals' RF. Community-based message tailoring studies with the medically underserved have focused primarily on cultural as opposed to psychological-tailoring techniques and provide inconclusive evidence as to the effectiveness of tailored health messages or the mechanisms by which they may influence behavior (Schneider, 2006). More research is needed to test the effectiveness of psychologically tailored health messages encouraging primary prevention behaviors in a community setting in this target population. Formative research indicated that the English as a Second Language (ESL) classroom was an effective setting for reaching a medically underserved Hispanic population (Martinez et al., 2012).

Using a 2×2 factorial design, we tested the hypothesis that exercise intentions and behavior would increase to a greater degree for individuals who received a message matching their RF compared to those who received mismatched messages. This hypothesis aligns with RF theory (Higgins, 2000). Specifically, we predicted that preventers would report greater intentions to engage, and actual engagements in a targeted behavior after receiving a prevention message (matched) versus a promotion message (mismatched), and that promoters would be more persuaded by promotion messages (matched) than prevention messages (mismatched).

Method

Both the Institutional Review Board at Yale University and the board of directors of the nonprofit organization through which participants were recruited approved the research protocol.

Participants

Adults ($N = 132$; 53.3% male) were recruited from an ESL program in the northeastern USA. A local non-profit organization offered the ESL classes for free in the evening at the local middle school. The community is served by a Federally Qualified Health Center

(FQHC), which provides primary care to areas deemed to be medically underserved by the federal government. The ESL program, located less than a half a mile from the FQHC and serving the same population, introduces students to the health center's services and teaches them how to navigate the health system. The program operates under an open enrollment policy such that students can join or leave class at any point in the semester. Changes in work schedules or acquisition of employment could lead a student to drop out of class. If a student missed three classes in a row, the next student on the waiting list was invited to enroll in the class.

Participants were primarily Hispanic and all were 18 years of age or older ($M_{age} = 35.45$, $SD = 11.55$). Nearly the entire sample (94.4%) indicated that they were born outside of the 50 US states (49.2% South America; 26.6% Mexico; 12.9% Central America; 6.5% Dominican Republic; and 4.8% Puerto Rico). Two-thirds of the participants (66.0%) had received their high school diploma or GED equivalent. Given the sensitivity of collecting demographic information with our target population, no additional demographic data were collected. A substantial number of participants were lost to follow-up (56% of sample) for the following reasons: the open enrollment policy of the ESL program; class attendance did not result in a Department of Education-endorsed diploma or certificate of completion; we did not collect any personal identifying information (such as phone numbers or mailing addresses); and follow-up data collection was conducted only in the classroom.

Measures

Dispositional regulatory focus—The Regulatory Focus Questionnaire (RFQ; Higgins et al., 2001) assessed dispositional RF. In accordance with recommendations of health literacy researchers (Doak et al., 1996) and formative research indicating that the RFQ items were too complicated for our target population (Domingo et al., 2011), questions were simplified to accommodate the low literacy levels of the students in their primary (Spanish) and secondary (English) languages. For example, 'When it comes to achieving things that are important to me, I find that I don't perform as well as I ideally would like to do' was changed to 'I do well at things that are important to me.' Respondents used a five-point Likert type scale ranging from 1 (*never*) to 5 (*very often*). Dispositional RF, a continuous variable, is represented by the difference between RFQ promotion and prevention scores (Higgins et al., 2001). Cronbach's alpha coefficients for the RFQ promotion and prevention subscales were .53 and .70, respectively.

Intentions—Three items assessed exercise intentions. Using a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) participants indicated whether they (a) thought about exercise, (b) planned to exercise, and (c) would try to exercise for 30 minutes, five times per week during their free time. Cronbach's alpha = .84.

Exercise behavior—Participants were given a calendar of a seven-day week and asked to write the number of times each day they exercised for at least 10 minutes during their free time. Exercise was defined as activity that makes your heart beat fast like running, aerobics, fast bicycling, soccer, or fast-paced dancing.

Messages

Participants received either prevention or promotion messages incorporated into three different classroom lessons and into their take-home assignments. Promotion messages emphasized the potential gains or benefits of exercise and prevention messages emphasized the costs or losses associated with being inactive. For example, a message in the promotion condition was: 'One way to feel your healthiest is by getting exercise!' In the prevention condition this message was: 'One way to not get sick is by exercising!' The researchers

designed and administered as guest lecturers the hour-long lessons. Information about exercise was presented at the appropriate level of ESL instruction. Three to four new exercise messages (one to two sentences each) were included in each lesson and presented verbally in writing. The messages were incorporated into classroom activities that focused on developing students' listening, speaking, reading, and writing skills. Participants were asked to practice (1) speaking skills by repeating messages orally in class, (2) writing skills by copying messages from the blackboard, and (3) reading skills by reading messages on worksheet activities. At the beginning of each class the messages from the previous session were reviewed and repeated.

Procedures

ESL classes were assigned randomly to either the promotion or prevention condition. Three classes were assigned to the promotion condition and two to the prevention condition using a computer-generated list of random numbers. Participants, regardless of their chronic RF (i.e. promoter or preventer), received tailored health messages according to which condition their class was assigned (i.e. promotion or prevention). Message match (i.e. promoters who received promotion messages; preventers who received prevention messages) and mismatch (i.e. promoters who received prevention messages; preventers who received promotion messages) was determined during data coding.

Prior to data collection, informed consent was obtained verbally with each student in their language of choice (Spanish or English). Participants completed surveys prior to the start of the intervention (Time 1) and eight weeks later (Time 2). Participants received \$10 for each completed survey. Surveys were presented in the language of choice of the student, either English or Spanish, with most participants preferring Spanish. RF was measured at Time 1 and intentions to engage in exercise as well as self-reported exercise behavior were measured at both Time 1 and 2. At baseline, intentions were measured using the first item of the three item scale only, in order to limit the number of survey questions asked of participants. Messages were delivered at three separate time points, specifically at two, five, and seven weeks after Time 1.

Results

Descriptive statistics

T-tests revealed no significant differences between individuals assigned to the promotion condition versus the prevention condition for age, RFQ scores, Time 1 intentions, or leisure time exercise behavior. To control for experiment-wise Type 1 error, alpha was adjusted using the Bonferroni criteria.

Substantial attrition occurred between Time 1 and Time 2 leaving only 58 participants (56% of sample) with complete data for inclusion in the test of the primary hypothesis. A Chi-square analysis was conducted to determine differences in participation rates across the two message conditions, and there were no significant between-groups differences ($p > .05$). Follow-up *t*-tests indicated no differences on any baseline variables between those individuals who provided data at Time 2 compared to those who did not. Among those who provided data at Time 2 there were no baseline differences between individuals assigned to promotion and prevention conditions.

At Time 1, participants reported strong intentions to engage in exercise during their free time ($M = 3.95$, $SD = 1.44$). Participants also reported that in the previous week they engaged in leisure time exercise on 2.73 days ($SD = 2.35$). RF was related significantly and positively to free time exercise ($r = .28$, $p = .005$; $n = 103$). The positive correlation indicates

that individuals with more of a promotion orientation were more likely to engage in leisure time exercise than those with more of a prevention orientation.

Main analysis

Before conducting the main analyses, RF scores were standardized by creating z scores using the SPSS software. Hierarchical linear modeling (HLM) was conducted to account for the non-independence of students within classrooms. Time 2 intentions and leisure time exercise behavior were modeled as a function of message condition (categorical variable), RF (continuous variable), and the message condition $\times$ RF interaction, adjusting for Time 1 intentions and exercise behavior.

For exercise intentions, the message condition $\times$ RF interaction was not significant ($p > .05$); thus, the regulatory fit hypothesis was not supported. There was a main effect for message condition ($\gamma = .73$, $SE = .37$, $p = .05$); students who received promotion messages reported higher Time 2 intentions ($M = 4.46$, $SD = .77$) compared to students who received prevention messages ($M = 3.85$, $SD = 1.07$). For Time 2 exercise behavior, the condition $\times$ RF interaction was not significant, nor was message condition ($p > .05$). Thus, the regulatory fit hypothesis was not supported with respect to behavior.

Discussion

The purpose of this study was to examine whether messages tailored to individuals' chronic RF affected exercise intentions and behavior among a limited-literacy, medically underserved population. In addition, we also sought to address a gap in the literature with regards to the effectiveness of community-based message tailoring interventions among the medically underserved. Overall, our findings did not support the regulatory fit hypothesis. These findings suggest that among limited-literacy, medically underserved populations, considering an individual's regulatory focus may not be necessary when providing them with messages aimed at increasing their exercise behavior.

Our findings revealed a significant main effect for message type. Participants receiving promotion messages reported greater intentions to engage in exercise than participants receiving prevention messages. According to RF theory, individuals weigh the benefits and risks of engaging in a given health behavior prior to taking action (Higgins, 2000). Promotion messages present exercise as a relatively low-risk behavior by focusing on the benefits of engaging in that behavior, while prevention messages present lack of exercise as a high-risk behavior because of the health repercussions of not exercising. Therefore, exercise as described by the promotion messages may be interpreted as more accessible and actionable than the same behavior described through the prevention messages. Presenting promotion messages to individuals might be a useful strategy to increase intentions to engage in exercise behaviors, regardless of their dispositional RF.

The results of this study suggest that promotion messages may be used to help increase intentions to exercise but not actual exercise behavior. Researchers have identified a common discrepancy in which individuals report intentions to engage in a behavior but do not follow-through by engaging in that behavior (e.g. Sheeran, 2002). As such, promotion messages may be an important first step in the development of intentions while additional intervention strategies are necessary to instill the skills needed to act on these intentions.

With regard to dispositional RF, we found a positive correlation with exercise. Specifically, those with a stronger promotion orientation were more likely to report engaging in exercise during their free time than those with a stronger prevention orientation. This finding supports other research using an online sample of adults indicating that those with a chronic

promotion orientation are more inclined to engage in (Pomery et al., 2010) and initiate healthy behaviors (Fuglestad et al., 2008). More research is required to further test and explain the positive correlation between promotion orientation and physical activity, particularly among a limited-literacy, medically underserved population.

The strengths of this study include a strong collaboration with an organization to recruit a hard-to-reach population (limited literacy, immigrant, and medically underserved). The ESL classroom is a fruitful setting for health communications research, given that it allows access to a hard-to-reach population over time, despite high attrition rates that result in part from open enrollment policies. It may have been possible to reduce the attrition rates by partnering with a Department of Education-administered ESL program in which the achievement of a diploma or official certificate serves as an incentive for class attendance. With respect to the limitations of this study, the sample sizes for both number of classrooms and individuals within the classrooms were small which may have prevented us from detecting regulatory fit effects (i.e. low power). The reliability score for the promotion scale of the RFQ was low ($\alpha = .53$) and may be one reason we did not detect a message condition $\times$ RF interaction. Furthermore, we assessed exercise behavior by self-report. To eliminate potential biases of such subjective measures, objective assessments of physical activity such as pedometers or accelerometers should be used. Finally, inherent in the message development process is the fact that promotion messages are easier to understand than prevention messages. For example, promotion messages focus on the benefits of engaging in a health behavior (e.g. 'Regular exercise can help you achieve health benefits'), while prevention messages focus on the negative outcomes associated with not engaging in the given behavior (e.g. 'Not engaging in regular exercise can lead to health problems'). Prevention messages are more grammatically complex which poses a potential barrier when working with a limited-literacy population (Rudd et al., 1999). Therefore, the composition of the messages themselves may have contributed to the finding that promotion messages work better in this population. An important lesson learned from conducting research in this community-based setting is the importance of including a formative phase where members of the target population review and even help craft the tailored health messages. This will allow for the creation of psychologically tailored messages that are appropriate for limited-literacy audiences and that align with the stated interests of the target audience.

Acknowledgments

This work was supported by the National Institutes of Health, National Cancer Institute [5R01CA068427], [5P30CA16359].

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