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The effects of gain-, loss-, and balanced-framed messages for preventing indoor tanning among young adult women

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Abstract

Indoor tanning (IT) increases the risks of skin cancer, but evidence on how to design health education messaging targeting IT among young adult women remains limited. This study investigated the effects of theory-guided gain-, loss-, and balanced-framed IT prevention messages. Young adult women ages 18 to 30 who indoor tan ($n = 552$, *mean* age = 24.9 years [*standard deviation* = 3.1]) were recruited online, completed pre-exposure measures, and were randomized to view a gain-, loss-, or balanced-framed message. Participants completed post-exposure measures of message response (emotional response, message receptivity), IT risk (perceived severity, susceptibility) and efficacy (self-efficacy, perceived benefits of avoiding IT) beliefs, and IT behavioral intentions. Loss- and balanced-framed messages promoted significantly greater emotional response and message receptivity and lower IT behavioral intentions than gain-framed messages. The effects of loss- and balanced-framed messages on IT behavioral intentions were mediated by greater emotional response and message receptivity compared with the gain-framed message. These results can inform the development of public health education campaigns to prevent and reduce IT among young adult women. Future research can build from these findings by investigating additional message themes and tailoring strategies to maximize their effects, examining the effects of framed messages prospectively, and investigating ways to enhance message receptivity, such as through novel message delivery channels (e.g., mobile devices).

Keywords

Skin cancer; indoor tanning; messaging; prevention; young adults

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Conflict of interest statement

None declared.

Introduction

More than 4 million cases of skin cancer are diagnosed in the U.S. annually and the incidence is increasing (Jemal et al., 2011; Siegel et al., 2014; Xiang et al., 2014). Skin cancer incurs significant morbidity, mortality, and financial costs, which is especially troubling from a public health perspective because most skin cancer is preventable through behavioral modification to reduce ultraviolet (UV) radiation exposure (U.S. Department of Health and Human Services [U.S. DHHS], 2014). Although sunlight is a common source of UV radiation exposure, artificial indoor tanning (IT) increases the risk of skin cancer and is estimated to account for 10% of all cases in the U.S. (Boniol et al., 2012; Wehner et al., 2012; Wehner et al., 2014). Among U.S. adults, the prevalence of IT is highest among white, young adult women ages 18 to 30 (Guy et al., 2013; Guy et al., 2015) and the effects on skin cancer risks are evident in this population. Women younger than age 30 who have indoor tanned are more than six times more likely to be diagnosed with melanoma than those who have not indoor tanned (Lazovich et al., 2016). Among young women, melanoma is one of the most commonly diagnosed malignancies, attributable in part to the high prevalence of IT in this group (Weir et al., 2011).

Population-level IT prevention efforts have focused primarily on youths under age 18 (e.g., minimum age restrictions, parental permission requirements) and research investigating health education interventions targeting young adult women is limited. In other areas of cancer prevention and control, public health communication messaging is a recommended best practice for preventing and reducing behavioral risk factors for cancer (Centers for Disease Control and Prevention [CDC], 2014). However, studies of skin cancer prevention messages have focused primarily on sun safety (McWhirter and Hoffman-Goetz, 2014; Williams et al., 2013), and evidence for public health education messages to prevent IT among young adult women is scarce (U.S. DHHS, 2014).

Based on Prospect Theory, research indicates that framing health messages around the costs of engaging in a risky behavior (i.e., loss-framed) or the benefits of avoiding a risky behavior (i.e., gain-framed) differentially affects behavioral outcomes (Rothman and Salovey, 1997; Tversky and Kahneman, 1981). The tenants of Prospect Theory suggest that public health education messages can be crafted around gains or losses to motivate IT behavior change (Rothman & Salovey, 1997). Evidence from meta-analyses favors gain-framed messages for motivating disease prevention behaviors (e.g., sun protection) and loss-framed messages for early disease detection behaviors (e.g., mammography), however framing effects are variable for specific behaviors within the disease prevention and early detection domains (Gallagher and Updegraff, 2012). The Extended Parallel Process Model (EPPM) (Witte and Allen, 2000) also indicates the effects of IT prevention messages may be enhanced when they include both gain- and loss-framed content. According to the EPPM, such balanced-framed messages may motivate behavior change because they affect beliefs about IT risks (perceived severity, susceptibility) and foster efficacy beliefs that behavior change is beneficial (i.e., response efficacy) and achievable (i.e., self-efficacy) (Witte & Allen, 2000). This is consistent with recent research on IT perceptions indicating that messaging conveying the risks of IT alone may not maximize the effects on behavior change (Carcioppolo, 2016). Finally, research also indicates visual imagery enhances the persuasive

appeal of health messages for skin cancer prevention by increasing receptivity to the messages and eliciting an emotional response (McWhirter & Hoffman-Goetz, 2012; McWhirter & Hoffman-Goetz, 2014; McWhirter & Hoffman-Goetz, 2015). Combined, the strategies of framing messaging around the risks of IT and benefits of IT avoidance and incorporating visual imagery may enhance the effects of messaging for IT prevention.

Recent studies have shown loss-framed messages conveying the risks of IT have a stronger effect than gain-framed messages on IT behavioral intentions among young adult women (Mays & Tercyak, 2015; Mays & Zhao, 2016). Consistent with a broader body of persuasion research (Dillard et al., 2007), evidence also indicates the effect of loss-framed messages on IT behavioral intentions is mediated by message receptivity and emotional response to the messages (Mays & Zhao, 2016). Previous studies have also developed and evaluated effects of balanced messages (i.e., messages containing both gain and loss themes in relatively equal measure) for other cancer prevention and control behaviors, supporting the hypothesis that balanced-framed may have effects for preventing IT (Evans, W.D. et al., 2015). However, like most message framing research (Gallagher and Updegraff, 2012), studies of IT prevention messages have only examined the effects of gain- and loss-framed messages and did not investigate the effects of balanced messages conveying both gain- and loss-framed content (Mays & Tercyak, 2015; Mays & Zhao, 2016). There is also limited evidence on whether framed messages affect behavioral intentions via constructs suggested by theories such as EPPM, including message response and IT risk (perceived severity, susceptibility) and efficacy (self-efficacy, response efficacy) beliefs.

In light of these gaps in the existing research, this study examined the effects of gain-, loss-, and balanced-framed messages on IT behavioral intentions among young adult women. Guided by the behavioral theories and previous research described above, this study also explored whether the effects of framed messages on IT behavioral intentions may be mediated by: 1) message response, including message receptivity and emotional response; 2) IT efficacy beliefs (self-efficacy, response efficacy); and 3) IT risk beliefs (perceived severity, susceptibility).

Methods

Participants

Participants were recruited through Amazon Mechanical Turk, an Internet-based crowdsourcing platform increasingly used for behavioral research, including studies of IT (Mays & Tercyak, 2015; Mays & Zhao, 2016; Carcioppolo, 2016). After a brief description of the study, Mechanical Turk members residing in the U.S. who were interested in participating reviewed a complete study description with a link to an online consent form and eligibility screener. Eligible participants were women between 18 and 30 years of age who self-identified as white race (including Hispanic and non-Hispanic ethnicities) and reported IT in the past year. Eligible, consenting participants completing all procedures were provided with a small monetary credit through Amazon. The host institution's institutional review board reviewed and approved the study protocol.

Procedures

After completing pre-exposure measures of demographics and IT behaviors, participants were randomized to view a gain-, loss-, or balanced-framed IT message. Participants viewed messages for as long as they wished, proceeded by clicking “next” after review of the messages, and then completed post-exposure measures of emotional response, message receptivity, IT risk and efficacy beliefs, and IT behavioral intentions.

The messages were designed based on evidence of skin cancer and other risks associated with IT (U.S. DHHS, 2014) and prior skin cancer prevention messaging research (McWhirter & Hoffman-Goetz, 2014; McWhirter & Hoffman-Goetz, 2015). Draft gain- and loss-framed messages were pre-tested in interviews with women meeting the same eligibility criteria for age and indoor tanning, revised according to their feedback, and tested in two prior experiments (Mays & Tercyak, 2015; Mays & Zhao, 2016; Mays et al., 2016).

Message content for this study including the text and imagery was developed from this previous work and targeted constructs relevant to the framing conditions from the behavioral theories described above (Rothman & Salovey, 1997; Witte & Allen, 2000). The loss-framed message displayed an image of a young woman’s face after surgery to remove skin cancer with text conveying the increased risks (i.e., susceptibility) and severity of skin cancer and other negative outcomes associated with IT. Example loss-framed text includes “Indoor tanning causes skin cancer, including deadly forms of skin cancer. Every time you tan, you increase your risk of skin cancer.” The gain-framed message displayed an image of the face of a woman with healthy skin with text conveying the benefits of avoiding IT to reduce risks and targeting self-efficacy to change IT behavior. Example gain-framed text includes “Avoiding indoor tanning will help keep your skin healthy. If you avoid indoor tanning, you can reduce your risk of skin cancer.” The image in both conditions was demographically targeted to the study population (i.e., a young adult, white female). The balanced-framed message was developed by combining text and visual elements from the gain- and loss-framed messages. The balanced-framed message included the same imagery and text from the loss- and gain-framed messages, in equal measure, with minor editorial changes to the text ensure messages were comparable across all three conditions with respect to length and structure. Messages are available from the authors by request.

Measures

Pre-Exposure

Demographics (age, household income, college/university student status) and past year IT behavior were measured using validated items (Guy et al., 2013). Frequent IT was operationalized as IT ten or more times in the past year (Guy et al., 2013).

Post-Exposure

Emotional Response.—Emotional response was measured with three items assessing whether participants felt frightened, anxious, or nervous while reading the message (Dillard & Shen, 2005). Responses were based on a four-point scale (1=not at all, 4=extremely) and

averaged to create a score with higher values indicating stronger emotional response (Cronbach's $\alpha = .88$).

Message Receptivity.—Receptivity to the messages was measured using a seven item scale (Zhao and Nan, 2010). Examples items included “The message was convincing” and “The message said something important to me.” Responses were based on a seven-point scale (1= strongly disagree, 7 = strongly agree) and were averaged to create a score with higher values indicating greater message receptivity (Cronbach's $\alpha = .92$).

Risk Beliefs.—Perceived severity of the risks of skin cancer was measured using five items from previous research (Greene and Brinn, 2003). Perceived susceptibility to skin cancer was measured using six items from a previous study (Greene & Brinn, 2003). Responses were based on a five-point scale (1=strongly disagree, 5=strongly agree) and averaged to create scores with higher values indicating greater perceived severity (Cronbach's $\alpha = .70$) and susceptibility (Cronbach's $\alpha = .85$).

Efficacy Beliefs.—Response efficacy was assessed using seven-items adapted from other cancer risk behavior research to capture the perceived benefits of avoiding IT (McKee et al., 2005). Example items include “I will lower my changes of melanoma” and “I will be healthier.” Responses were based on a seven point scale (1=no chance, 7 = certain to happen) and averaged to create a score with higher values indicating stronger perceived response efficacy (Cronbach's $\alpha = .90$). Self-efficacy was measured using two items assessing how confident participants were and how easy it would be to quit IT in the next year (Mays et al., 2015). Responses were based on a seven point scale (1=not at all, 7 = extremely) and averaged to produce a score with higher values indicating greater self-efficacy (Cronbach's $\alpha = .85$).

Indoor Tanning Behavioral Intentions.—The primary outcome was IT behavioral intentions because assessment of behavioral intentions has been demonstrated to predict future health behavior change (Wood et al., 2016). IT behavioral intentions were captured using two items assessing intentions to tan even once and intentions to tan regularly in the next year on a seven point scale (1 definitely will not, 7 definitely will) (Mays & Tercyak, 2015; Mays & Zhao, 2016). Intentions to quit IT were measured using a single item with a seven-point response scale (1= not at all, 7= a lot) (Mays & Tercyak, 2015; Mays & Zhao, 2016). These items were highly correlated (r 's = .62-.69, all p 's < .05) and had good internal consistency when the intention to quit item was reverse-coded (Cronbach's $\alpha = .84$). The items were averaged into a single variable with higher values indicating stronger intentions to indoor tan.

Statistical Analyses

All variables were examined descriptively and bivariate analyses were used to test for differences across the messaging conditions. No participant characteristics differed significantly by condition, therefore analyses did not adjust for covariates. Analysis of variance (ANOVA) was used to test for differences in message response, risk beliefs, efficacy beliefs, and behavioral intentions based on the experimental conditions. Pair-wise

differences in least squares means for each variable were inspected, applying Tukey's adjustment for multiple comparisons where appropriate.

Exploratory mediation analyses were conducted to estimate the following in a structural equation model (SEM): 1) direct effects of framed messages on message response variables; 2) direct effects of framed messages on risk beliefs and efficacy beliefs, and indirect effects via message response variables; 3) direct and indirect effects of framed messages on behavioral intentions through message response, risk beliefs, and efficacy beliefs. Model fit was evaluated based on the comparative fit index (CFI) and the root mean square error approximation (RMSEA) (Hu and Bentler, 1999). Message receptivity and emotional response were latent variables in the model. Indirect effects were tested using a bias-corrected bootstrapping approach with 1,000 resamples to address non-normality in the product of coefficients (Preacher and Hayes, 2008). Asymmetric 95% confidence intervals around the estimates that do not include zero indicate statistically significant indirect effects (Preacher & Hayes, 2008). Given the ANOVA findings described below, gain-framed messages were used as the comparison in the SEM. Although the findings are based on a single SEM, for clarity in the visual presentation of findings paths from the loss- and balanced-framed messages (compared with gain-framed messages) are displayed separately in Figure 1. Mediation analyses were conducted using Mplus 7.1 (Los Angeles, CA); all other analyses were conducted using SAS 9.3 (Cary, North Carolina).

Results

Participants

In total 1,939 individuals responded to eligibility screening questions and 552 (28.5%) were eligible and completed study procedures. Characteristics of the sample are shown in Table 1. Participants averaged 24.9 (*SD* 3.1) years of age, 5.1% identified as Hispanic ethnicity, and 41.9% were frequent indoor tanners.

Analysis of Variance Results

There were significant message framing main effects for emotional response ($F = 14.3$, partial $\eta^2 = .05$, $p < .001$), message receptivity ($F = 9.51$, partial $\eta^2 = .03$, $p < .001$), perceived susceptibility ($F = 4.68$, partial $\eta^2 = .02$, $p = .010$), and behavioral intentions ($F = 8.75$, partial $\eta^2 = .03$, $p < .001$). Least squares means for all variables are shown in Table 2. Loss-framed (*Mean [M]* 2.3, *Standard Error [SE]* .06, $p < .001$) and balanced-framed (*M* 2.3, *SE* .06, $p < .001$) messages prompted stronger emotional response than the gain-framed message (*M* 1.9, *SE* .06). Participants reported greater message receptivity in response to the loss-framed (*M* 5.3, *SE* .09, $p = .005$) and balanced-framed (*M* 5.4, *SE* .09, $p < .001$) messages than the gain-framed message (*M* 4.8, *SE* .09). Participants also reported greater perceived susceptibility to skin cancer in response to balanced-framed message (*M* 3.4, *SE* .06) compared with the gain-framed message (*M* 3.1, *SE* .06, $p = .065$). Finally, participants viewing loss- (*M* 3.5, *SE* .12, $p = .001$) and balanced-framed (*M* 3.5, *SE* .12, $p < .001$) messages reported lower intentions to indoor tan compared with gain-framed message (*M* 4.1, *SE* .12).

Mediation Analysis Results

Results of the SEM exploring potential mediators of message framing effects are shown in Figure 1. The model fit the data moderately well (Model χ^2 [82 df] = 321.82, RMSEA = .07, CFI = .95) based on recommended fit criteria (Hu & Bentler, 1999).

Compared with gain-framed messages, there was a significant direct effect of loss-framed messages (Figure 1) on behavioral intentions ($\beta = -0.26$, 95% CI = $-0.52, -0.02$), indicating the effects of loss-framed messages on behavioral intentions were partially mediated by the indirect effects in the model. The total indirect effect of loss-framed messages on behavioral intentions was -0.24 (95% CI = $-0.45, -0.05$), which was primarily accounted for by the indirect effect of loss-framed messages on behavioral intentions through greater message receptivity ($\beta = -0.20$, 95% CI = $-0.35, -0.05$). Other significant indirect effects in the model indicate loss-framed messages affected response efficacy and perceived susceptibility via greater emotional response, and affected self-efficacy, response efficacy, perceived severity, and perceived susceptibility via greater message receptivity (Figure 1).

Compared with gain-framed messages, the direct effect of balanced-framed messages on behavioral intentions was no longer significant (Figure 1), indicating the effects were fully mediated by the indirect effects in the model. The total indirect effect of balanced-framed messages on behavioral intentions was -0.30 (95% CI = $-0.54, -0.07$), which was primarily accounted for by the indirect effect of balanced messages on behavioral intentions through greater message receptivity ($\beta = -0.27$, 95% CI = $-0.44, -0.11$). Other significant indirect effects in the model indicate balanced-framed messages affected response efficacy and perceived severity via greater emotional response, and affected self-efficacy, response efficacy, perceived severity, and perceived susceptibility via greater message receptivity (Figure 1).

Discussion

Unlike other areas of cancer prevention and control (CDC, 2014), there is limited evidence on how to optimally design public health education messages for IT targeting at-risk populations, such as young adult women (U.S. DHHS, 2014). Such public health messages have been advocated to prevent and reduce IT and thereby reduce skin cancer risks among young women, but there remains a need for research to inform their development (U.S. DHHS, 2014).

This study sought to fill this research gap by examining the effects of gain-, loss-, and balanced-framed IT prevention messages among young adult women who indoor tan. Compared with gain-framed messages, both loss-framed and balanced-framed messages had stronger effects for reducing IT behavioral intentions. This is consistent with recent studies showing that loss-framed messages have stronger effects than gain-framed messages for reducing IT behavioral intentions (Mays & Tercyak, 2015; Mays & Zhao, 2016) and research demonstrating that risk-based skin cancer prevention messaging is efficacious (McWhirter & Hoffman-Goetz, 2014; McWhirter & Hoffman-Goetz, 2015). The findings build from the existing evidence by demonstrating the potential value of balanced-framed

messages consistent with the theoretical models guiding this study. Overall, the study findings and previous research (Mays & Tercyak, 2015; Mays & Zhao, 2016) suggest loss- and balanced-framed messages may be effective in public health education interventions and communication campaigns to prevent IT.

This study also explored potential mediating mechanisms through which loss- and balanced-framed messages may affect IT behavioral intentions. The findings indicate the effects of loss- and balanced-framed messages appear to be due to the fact that these messages evoked a stronger emotional response and that participants were more receptive to these messages versus gain-framed messages. That loss- and balanced-framed messages evoked a stronger emotional response than gain-framed messages is consistent with other cancer prevention messaging research (e.g., tobacco messaging) indicating emotional response as a mediator of messaging effects (Evans, A.T. et al., 2015; Noar et al., 2016). Additionally, persuasion research indicates message receptivity is key factors influencing the effects of public health messages (Dillard et al., 2007). However, it is important that these findings are considered in light of the cross-sectional study design and the fact that messages were delivered in a single, brief exposure. Due to these features of the study, the mediation findings should be considered preliminary.

This study contributes uniquely to the evidence on IT prevention messaging, and to the public health education and communication literature more broadly, by demonstrating that balanced-framed messages that include both gain- and loss-framed content are potentially effective for preventing and reducing IT. This finding is consistent with one other study demonstrating that balanced-framed messages increased adults' intentions to follow preventive cancer screening guidelines (Evans, W.D. et al., 2015b). Few studies in general have investigated the effects of balanced framed messages (Gallagher & Updegraff, 2012), and this is particularly the case of research on framed messaging for IT prevention (Mays & Tercyak, 2015; Mays & Zhao, 2016). Notably, there were no differences in efficacy beliefs (self-efficacy or response efficacy, the belief that avoiding IT is beneficial) across conditions, one set of beliefs the balanced-framed messages were intended to target. This could be because the messages did not sufficiently emphasize these beliefs, or they may be difficult beliefs to affect with a single message exposure. Although the findings provide some support for the efficacy of balanced-framed messages for motivating IT behavior change, research should continue to investigate ways to more specifically target efficacy beliefs through such messages.

Future research can build from these results in several ways. Prospective studies examining the effects of repeated exposures to framed messages are needed to determine their impact on behavioral outcomes and to investigate mediating mechanisms in a robust way. Research investigating ways to enhance message receptivity may also be fruitful. This may include examining other messaging themes that resonate with young women that were not studied here (e.g., IT as a potentially addictive behavior)(Petit et al., 2014) and investigating novel delivery channels to enhance receptivity. For example, virtually all U.S. young adults use mobile phones for text messaging (Smith, 2015), which could be an important message delivery channel to enhance message appeal in this group. Recent research demonstrates the feasibility and potential effect of such an approach for reducing IT among young women

(Evans & Mays, 2016). This study investigated a general approach to messaging from the standpoint of generating evidence that could inform, for example, population-based communication campaigns. Recent evidence points to the value of developing and examining messages targeting specific subgroups of indoor tanners, including targeting messaging based on IT behavioral patterns (Kelley et al., 2016) and pre-existing beliefs about the risks of IT (Carciooppolo, 2016). This is an important area for future study to optimize the effects of IT prevention messaging.

The study findings may also inform policy efforts related to IT. In 2015, the Food and Drug Administration (FDA) proposed regulations restricting access to IT to adults ages 18 years and older, requiring that consumers sign a statement acknowledging the risks of IT in retail settings, and specifying required health warning messages on IT device labeling (FDA, 2015). The FDA also displays public-facing information on the agency's website to educate consumers about the potential risks of IT (FDA, 2015). The findings of this research could inform public health education aspects of IT regulations, including how to optimally design the risk acknowledgement statement consumers will be required to sign and the design of health warning messages for tanning devices (Mays & Tercyak, 2015; Mays & Zhao, 2016). As the recently proposed rule is finalized and as the FDA considers additional potential requirements, this line of research on prevention messaging could help to inform the development of such aspects of IT regulations.

Limitations

The study findings should be interpreted in light of notable limitations. Data were collected through an online crowdsourcing platform and among a convenience sample of young adult women. Previous IT prevention research has focused predominantly on female college student samples (e.g., Heckman et al., 2009; Hillhouse et al., 2008). Since we included a broader age range of participants and did not focus on college students, the study sample is somewhat older age, most were nonstudents, and they reported higher household income than previous work in this area. The representativeness of the online, crowdsourced convenience sample is not clear, and generalizing to broader populations is cautioned. All study measures are based on participant self-report, and although prior research has demonstrated self-report measures of skin cancer risk behaviors to be valid (Glanz et al., 2008; Glanz et al., 2010), they are potentially subject to reporting biases. The study assessed the effects of a single, brief exposure to IT messages on behavioral intentions and the observed effects were modest. Measures of behavioral intention are correlated with future behavior, but this does not provide a direct assessment of behavior change (Wood et al., 2016). Although message content was largely balanced across conditions, the balance-framed message contained more visual imagery content than others tested. Future research is needed to test multiple message themes within each framing condition and to determine if repeated exposure to framed messages prospectively leads to IT behavior change. Prospective studies of framed message effects will also provide a more robust test of the hypothesized cognitive mediators of message framing effects (e.g., risk beliefs, efficacy beliefs) as outlined in EPPM (Witte and Allen, 2000).

Conclusions

The study findings indicate that loss- and balanced-framed IT prevention messages are potentially effective for preventing and reducing IT among white, young adult women, the primary consumers of IT in the U.S. and a group at increased risk of skin cancer as a consequence. The findings suggest the effects of loss- and balanced-framed messages on IT risk and efficacy beliefs and behavioral intentions were primarily due to a greater emotional response and greater message receptivity compared with gain-framed messages. Future research can build from this investigation by examining additional ways to design message content, message targeting strategies, and alternative message delivery channels, such as mobile phones, to increase message receptivity and enhance their effects among young women. Prospective studies to examine the effects of repeated exposure to the messages on behavioral outcomes and provide robust evidence of mediating mechanisms are also needed. This line of research can inform public health education messaging and communication campaigns surrounding IT, and also has the potential to guide policy-based health education measures for skin cancer prevention.

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Figure 1. Effects of loss- and balanced-framed messages on message response, risk and efficacy beliefs, and behavioral intentions.

Effects of loss- (left panel) and balanced-framed (right panel) messages relative to gain-framed messages were examined in a single structural equation model. Message effects relative to gain-framed messages are shown separately for visual presentation. Model χ^2 [82 df] = 321.82, RMSEA = .07, CFI = .95. Latent variables indicated as ovals, observed variables as rectangles. Only statistically significant paths ($p < .05$) are displayed.

Table 1.

Sample characteristics

<i>N</i> = 552		
	<i>n</i> or <i>Mean</i>	<i>%</i> or <i>Std Dev.</i>
Demographics		
Age, years (<i>M</i> , <i>SD</i>)	24.9	3.1
Hispanic Ethnicity		
Yes	28	5.1%
No	521	94.9%
Current Student		
Yes	239	43.5%
No	310	56.5%
Household Income		
< \$20,000	82	14.9%
\$20,001-\$35,000	137	24.8%
\$35,001-\$50,000	124	24.5%
\$50,001-\$75,000	111	20.1%
>\$75,000	87	15.8%
Prefer Not to Say	11	2.0%
Past Year Frequent Indoor Tanning Behavior		
Tanned 10 Times	231	41.9%
Tanned < 10 Times	321	51.1%
Message Response		
Emotional Response <i>M</i> , <i>SD</i> (range 1 to 4)	2.1	0.9
Message Receptivity <i>M</i> , <i>SD</i> (range 1 to 7)	5.2	1.3
Risk Beliefs		
Perceived Severity of Risks <i>M</i> , <i>SD</i> (range 1 to 5)	3.6	0.7
Perceived Susceptibility to Risks <i>M</i> , <i>SD</i> (range 1 to 5)	3.3	0.9
Efficacy Beliefs		
Self-Efficacy to Quit <i>M</i> , <i>SD</i> (range 1 to 7)	5.0	1.7
Response Efficacy <i>M</i> , <i>SD</i> (range 1 to 5)	4.8	1.2
Intentions to Indoor Tan <i>M</i> , <i>SD</i> (range 1 to 7)	3.7	1.7

Note: Data display *n* and % of the sample unless otherwise indicated. Some totals do not sum to total sample *n* due to sporadic missing data (<1% of sample for any given variable).

Table 2.

Least square mean differences in message response, efficacy beliefs, risk beliefs, and behavioral intentions by message framing

	Message Response			Efficacy Beliefs			Risk Beliefs			Behavioral Intentions		
	Emotional Response	Message Receptivity	Self-Efficacy	Response Efficacy	Perceived Severity	Perceived Susceptibility						
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
Gain-Framed (A)	1.9 ^{B,C}	.06	4.8 ^{B,C}	.09	4.9	.13	4.8	.09	3.6	.05	3.1 ^{C*}	.06
											4.1 ^{B,C}	.12
Loss-Framed (B)	2.3 ^A	.06	5.3 ^A	.09	5.1	.13	4.9	.09	3.6	.05	3.3	.06
											3.5 ^A	.12
Balanced-Framed (C)	2.3 ^A	.06	5.4 ^A	.09	5.0	.13	4.8	.09	3.6	.05	3.4 ^A	.06
											3.5 ^A	.12

Note: Least squared means produced by analysis of variance. *M* = mean, *SE* = standard error. Different superscript letters adjacent to means within a column indicate statistically significant differences between conditions at $p < .05$ after Bonferroni correction.

* Indicates gain framed message differed from loss-framed message on perceived severity at $p = .065$.