Article

Using High-Level Construal and Perceptions of Changeability to Promote Self-Change Over Self-Protection Motives in Response to Negative Feedback

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Abstract

Diagnostic negative information presents people with a motivational dilemma. Although negative feedback can provide useful information with which to guide future self-improvement efforts, it also presents short-term affective costs. We propose that construal level, jointly with the perceived changeability of the feedback domain, determines whether people choose to accept or dismiss such information. Whereas low-level construal promotes short-term self-protection motivation (promoting dismissal), high-level construal promotes long-term self-change motivation (promoting acceptance)—to the extent that change is perceived as possible. Four studies support this hypothesis and examine underlying cognitive and motivational mechanisms. The present work may provide an integrative theoretical framework for understanding when people will be open to and accept negative diagnostic information, and has important practical implications for promoting self-change efforts.

Keywords

construal level theory, perceived changeability, defensive information processing, self-threat, self-change, health communication

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People are regularly confronted with diagnostic negative information about their knowledge, skills, and behavior—feedback that provides an accurate yet painful assessment of weaknesses and deficiencies. Research suggests that people often feel threatened by negative diagnostic information and, when exposed to it, respond with defensive dismissal—the refusal to accept or acknowledge the validity and relevance of the information. Although defensive dismissal of negative information may support positive feelings and high self-esteem, it may also lead people to deny serious problems, which may result in engaging in maladaptive or self-injurious behaviors (e.g., Ditto & Lopez, 1992; Dweck & Leggett, 1988; Sherman, Nelson, & Steele, 2000). The conditions that lead people to dismiss versus accept negative information are thus a major focus of research in social psychology (e.g., Dweck & Leggett, 1988; Freitas, Salovey, & Liberman, 2001; Sedikides & Hepper, 2009; Sherman et al., 2000; Trope & Neter, 1994). In this article, we examine how people's subjective understanding or construal of diagnostic negative feedback plays a critical role in their dismissal versus acceptance of the information.

The Dual-Motive Dilemma

To understand people's responses to negative feedback, one must understand the dynamic interplay of self-evaluative motives. Research suggests that people's self-evaluative motives can be classified into two broad categories: self-protection motives versus self-change motives. Self-protection motives, such as self-enhancement (and self-verification, among high self-esteem individuals), promote construction, confirmation, and defense of positive beliefs about one's self (e.g., Sedikides & Strube, 1997). By contrast, self-change motives, such as self-assessment and self-improvement, are tuned to diagnosing one's strengths and weaknesses, and using this information to better one's self (e.g., Sedikides & Hepper, 2009). These self-protection motives and self-change motives conflict when people have opportunities to receive negative diagnostic information about themselves (e.g., Dweck & Leggett, 1988; Sedikides & Hepper, 2009; Taylor, Neter, & Wayment, 1995; Trope & Neter, 1994). Although negative feedback may be valuable in the long term by helping to diagnose areas of weakness that can be targeted for later improvement (thus activating the self-change motives), it also presents an immediate threat to positive self-views

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(thus activating the self-protection motives). People who sunbathe, for example, may be tempted to dismiss their risk for skin cancer because accepting this risk requires acknowledging that they have engaged in maladaptive health behavior. Dismissing this self-threatening information, however, can lead them to miss opportunities to diagnose their tanning behavior as problematic and subsequently improve long-term health. How people resolve this dual-motive conflict thus determines their responses to negative information. Factors that tip the relative balance of these two motives in favor of self-change over self-protection should promote greater acceptance rather than dismissal of negative information.

Construal Level Theory (CLT)

Inspired by CLT (Trope & Liberman, 2010), we propose that one factor that may promote self-change motivation over self-protection motivation is how people subjectively represent or construe the feedback situation. Central to CLT is the notion of psychological distance. Distant events involve the removal of an event from the direct experience of the here-and-now. People tend to lack reliable detailed specifics about psychologically distant events. To prepare and plan for distant events, people engage in high-level construal—the process of cognitive abstraction to extract the general, global, and goal-relevant features likely to be apparent across all possible manifestations of the events. As events become more proximal and detailed specifics become increasingly available and reliable, people are able to engage in low-level construal, incorporating the idiosyncratic and secondary features that highlight the event's uniqueness. In sum, low-level construal allows people to immerse into the rich nuances of the here-and-now; high-level construal allows people to transcend the present and mentally travel to other times, places, people, and possibilities.

People can engage in high- versus low-level construal in the absence of any changes in psychological distance (e.g., Freitas, Gollwitzer, & Trope, 2004; Fujita, Trope, Liberman, & Levin-Sagi, 2006; see also Vallacher & Wegner, 1989). By engaging in high-level construal of the immediate here-and-now, people can psychologically remove themselves from the pressing demands of the present and better recognize the global implications of their decisions and behavior. Research suggests, for example, that rather than be swayed by salient local cues, people tend to behave in a goal- or value-consistent manner when engaged in high-level rather than low-level construal (Eyal, Sagristano, Trope, Liberman, & Chaiken, 2009; Fujita et al., 2006; Torelli & Kaikati, 2009). For example, female undergraduates, a population generally concerned about weight-loss, are more likely to ignore the allure of a chocolate bar and instead exhibit goal-consistent preferences to eat an apple when engaged in high-level rather than low-level construal (Fujita & Han, 2009).

The enhanced consideration of long-term and global (rather than more short-term and local) concerns when engaged in high-level (rather than low-level construal) has important implications for understanding people's reactions to negative self-relevant information. Although negative feedback identifies areas of weakness to which one can direct effort to improve upon over time (activating self-change motivation), it also presents short-term affective costs (activating self-protection motivation). Whereas high-level construal should promote acceptance of negative feedback in service of self-change, low-level construal should promote dismissal of this feedback in service of self-protection.

Initial evidence supporting our theoretical assertions comes from research examining the role of construal levels on self-relevant information search (Freitas et al., 2001) and counterfactual generation (Rim & Summerville, 2014). Freitas and colleagues (2001) showed that high-level, relative to low-level, construal was associated with increased interest in upward social comparison and stronger interest in receiving negative feedback. Similarly, Rim and Summerville (2014) demonstrated that high-level relative to low-level construal enhances upward rather downward counterfactuals—leading people to think about how things might have been better rather than worse. Collectively, this work suggests that high-level relative to low-level construal promotes self-change over self-protection concerns in decisions about whether to expose one's self to potentially threatening information.

The present research advances this past work in two important ways. First, we examine what people do when they can no longer avoid negative information through selective information search and counterfactual generation but instead are directly confronted with it. The conflict between self-protection and self-change is relevant not only to decisions about whether to avoid negative information but also to the processing and potential acceptance of this information when it is unavoidable (e.g., Raghunathan & Trope, 2002; Trope, Ferguson, & Raghunathan, 2001). To date, no research has yet examined the effect of construal level on the latter. This research question is particularly important because it represents a more stringent test of the dual-motive framework. As direct exposure to the negative information acutely activates both self-change and self-protection concerns, these conflicts are harder to resolve. Previous research suggests that in these situations, people generally dismiss, and even derogate, negative self-relevant feedback (e.g., Ditto & Lopez, 1992; for review, see Sedikides & Strube, 1997). We instead propose that high-level construal, relative to low-level construal, will tip the balance in favor of long-term self-change motivations over short-term self-protection motivations even in these more difficult conditions, thereby reducing defensive dismissal and instead promoting acceptance of negative information.[1]

Second, we explore more thoroughly the cognitive and motivational mechanisms by which construal levels impact people's responses to negative feedback. Freitas et al. (2001) demonstrated that high-level construal, relative to low-level construal, reduced people's sensitivity to the costs and

inconveniences associated with seeking diagnostic feedback. In the present research, we explore boundary conditions and mediating variables for the effect of construal level on self-evaluative motivation. From a cognitive perspective, we examine how construal level changes people's interpretation of the feedback. To the extent that high-level construal, relative to low-level construal, promotes self-change over self-protection motives, then people should interpret and understand negative information as helpful feedback rather than threatening information.

We examine the motivational mechanisms in two ways. First, we examine the role of motivational relevance as a critical boundary condition. If indeed changes in construal level influence information processing by the dual-motive dynamics that we propose, then the effect of construal should be evident only under conditions of high motivational relevance. When feedback is self-relevant, the dual-motive conflict between self-change and self-protection is most acute. It is under these conditions in which factors (like construal level) that tip the dual-motive balance one way or another are likely to have their greatest effect. When the dual-motive conflict is less acute (i.e., when feedback is not self-relevant), tipping factors should have less dramatic (if any) impact. That is, because neither self-change nor self-protective motivations are activated by non-relevant feedback, there is no dual-motive balance to tip in the first place. Thus, examining the self-relevance of negative feedback as a boundary condition is critical for illustrating the motivational mechanisms that we propose.

As further examination of motivational mechanism, we examine the perceived changeability of the feedback domain as a second critical boundary condition. If indeed people's openness to negative information is motivated by a desire for self-change as we suggest, then this openness should be evident only to the degree that people believe such change is possible. When one's standing in a particular domain is unchangeable, no positive change or improvement is possible. Supporting this assertion, research indeed suggests that domains need to be perceived as inherently changeable (vs. unchangeable) for people to be open to negative feedback (e.g., Dweck & Leggett, 1988; Johnson & Fujita, 2012; Melnyk & Shepperd, 2012; Trope, Gervey, & Bolger, 2003). If high-level construal, relative to low-level construal, promotes self-change over self-protection motives in the manner that we propose, then the effect of construal should be evident to the degree that change is believed to be possible. When no such change is possible, there should be no effect of construal level. Documenting perceived changeability as a boundary condition thus provides another critical test of our dual-motive model.

We conducted four experiments that demonstrate that high-level construal relative to low-level construal enhances acceptance of negative information (Studies 1-3), and examine how feedback is interpreted as a potential mediating mechanism (Studies 3A and 3B). Highlighting the motivational basis for our theoretical model, we predict these effects should be evident primarily among those to whom the negative feedback is self-relevant. To demonstrate that this construal-dependent acceptance of negative feedback is motivated by self-change over self-protection concerns, we manipulate the perceived changeability of the feedback domain (Studies 2 and 3). We predict that the effect of construal on acceptance of negative feedback should be evident to the extent that the feedback domain is perceived to be changeable rather than unchangeable. Finally, we show that such changes in information processing can have important behavioral consequences, as revealed by people's subsequent information search decisions (Study 2).

Study 1

Overview

In Study 1, tanners and non-tanners were induced to high-level versus low-level construal and read a health message highlighting the negative consequences of sun and UV light exposure. They then indicated to what extent the message motivated them to change their sun exposure behavior as a measure of acceptance of negative feedback (Ditto & Lopez, 1992). We predicted that among the tanners in our sample, those induced to high-level construal relative to low-level construal would be more likely to assimilate the negative feedback, thereby reporting greater motivation to change their behavior.

Method

Participants. Eighty-five Caucasian undergraduate students (47 female, 38 male) participated in a study on health communication for partial course credit at the beginning of the fall quarter at The Ohio State University. We utilized a time-based stop-rule, ceasing data collection after a 3-week window. No data were analyzed prior to this stop-date. Participants ranged in age from 18 to 29 (M = 18.88, SD = 1.66).

Materials and procedure. Participants completed all materials on a computer. They first completed measures designed to assess the motivational relevance of a skin cancer health message. Specifically, participants reported whether they had tanned in a tanning bed (yes/no). We identified 30 participants who reported tanning in a tanning bed (i.e., "tanners"), for whom our health message would represent motivationally relevant information.

Participants next completed a construal level manipulation, based on past research (Fujita et al., 2006). Participants were presented with 20 objects (e.g., soda). Those in the high-level construal condition were asked to provide a superordinate category to which each object belonged (e.g., a drink),

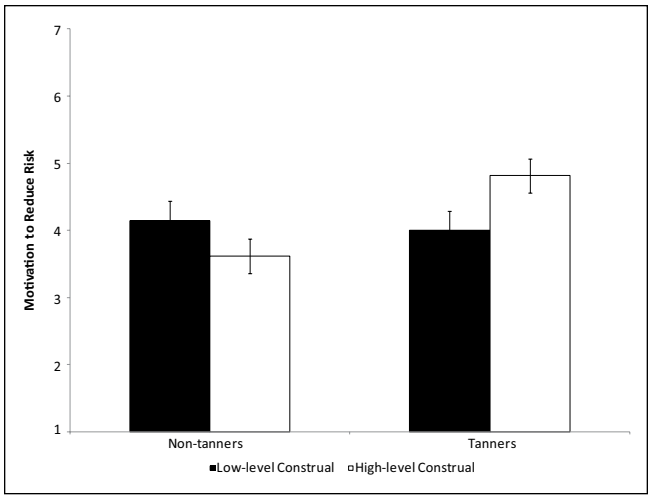

Figure 1. Motivation to reduce risk as a function of construal level and relevance (Study 1).
Note. Error bars indicate standard error of the mean.

whereas those in the low-level construal condition were asked to provide a specific example of each object (e.g., Coke). Research has shown similar procedures reliably induce high-level versus low-level construal of subsequent unrelated tasks (Fujita et al., 2006).

Next, participants read a message about the dangers of skin cancer and tanning (see Appendix A). After reading the message, they completed several items assessing acceptance, adapted from Ditto and Lopez (1992). Specifically, we asked participants "How motivated are you to reduce your risk for skin cancer," "How motivated are you to buy sunblock," "How motivated are you to check your skin for skin cancer," and "How motivated are you to receive additional information about the dangers of skin cancer and tanning?" (1 = *not at all*, 7 = *extremely*). These items were averaged to form a single index ($\alpha = .82$), with higher scores indicating greater acceptance. Participants then completed several demographic items and were debriefed and dismissed.

Results and Discussion

We analyzed participants' acceptance of the negative feedback as a function of construal level (high-level vs. low-level) and relevance (tanners vs. non-tanners) using a 2 × 2 between-subjects ANOVA. In general, tanners ($M = 4.41$, $SD = 1.11$) were more motivated to reduce their risk than non-tanners ($M = 3.85$, $SD = 1.43$), $F(1, 81) = 3.13$, $p = .08$, $d = 0.39$ (95% confidence interval [CI] = [0.00, 0.75]). As predicted, construal level moderated the effect of tanning history on participants' assimilation of the health message, $F(1, 81) = 5.11$, $p = .03$, $\eta_p^2 = .06$ (95% CI = [0.003, 0.16]). As depicted in Figure 1, tanners engaged in high-level construal ($M = 4.82$, $SD = 0.98$) were more motivated to reduce their risk of skin cancer than those engaged in low-level construal ($M = 4.00$, $SD = 1.11$), $F(1, 28) = 4.58$, $p = .04$, $d = 0.81$ (95% CI = [0.11, 1.40]). Changes in construal level produced no effect among non-tanners, $F(1, 53) = 1.84$, $p = .18$, $d = 0.37$ (95% CI = [0.00, 0.81]).

These findings suggest that changes in construal level can enhance acceptance of negative diagnostic information. Tanners engaged in high-level relative to low-level construal appeared more willing to assimilate negative health information, expressing stronger desires to engage in self-change. That such findings were specific to tanners, moreover, highlights that this change in information processing is motivated in nature.

To provide more stringent evidence that the results of Study 1 reflect the operation of self-change motivation, in Study 2, we manipulated the perceived changeability of the feedback domain. As noted earlier, self-relevant feedback is instrumental for self-change only to the extent that the target domain of the feedback is changeable. If no change is possible, this feedback is less useful and no longer worth bearing the negative affective costs (e.g., Dweck & Leggett, 1988; Taylor et al., 1995; Trope et al., 2003). If high-level construal motivates long-term self-change efforts over more short-term self-protection, then people should show greater acceptance of self-relevant information specifically about changeable, and not unchangeable, domains. Not finding this pattern of moderation by changeability would be difficult to explain from our theoretical perspective; thus, Study 2 provides a critical test of our dual-motive model.

Study 1 also relied on self-report methodology. In Study 2, we assessed acceptance of negative feedback behaviorally by observing participants' information search behavior following exposure to negative feedback. People who defensively dismiss the initial feedback might be expected to avoid exposing themselves to supplementary information that is consistent in content and tone with the initial negative message. They might also seek out supplementary information that allows them to counter argue the initial information. By contrast, people who have accepted the initial negative feedback should be motivated to seek out supplemental information with which to learn more about how to address their weaknesses.[2] We thus predicted that following unavoidable, direct exposure to negative feedback, high-level, relative to low-level, construal would promote subsequent information search for feedback-consistent rather than feedback-inconsistent information. We further predicted that this effect of construal would be most apparent when the negative feedback was self-relevant and addressed a changeable rather than unchangeable domain, demonstrating the operation of self-change motivations.

Study 2

Method

Participants. One hundred thirty-three Caucasian undergraduate students (58 female, 72 male, 3 unreported) participated in the study for partial course credit at Ohio State University. As in Study 1, we utilized a time-based stop-rule. Because

we collected these data at a more active time of the academic semester, data collection proceeded much more quickly relative to Study 1. We thus limited our data collection window to 1 week. Participants ranged in age from 18 to 53 (M = 19.18, SD = 3.20).

Materials and procedure. As in Study 1, participants first completed measures designed to assess the motivational relevance of a skin cancer health message. Relatively fewer participants (n = 28) in Study 2 reported a history of tanning behavior as compared with the other studies that we report in this article. Therefore, we used a family history of skin cancer (n = 48) as our operationalization of relevance, reasoning that the message would be more motivationally relevant to those with rather than without a family history.[3]

Participants then completed a construal level manipulation adapted from Freitas et al. (2004). Participants in the high-level construal condition were asked to list reasons why they should improve and maintain their health, whereas participants in the low-level construal condition were asked to list the means by which they could improve and maintain their health. Although previous research has shown these procedures reliably induce high-level versus low-level construal of subsequent tasks (e.g., Freitas et al., 2004; Fujita et al., 2006), we conducted a pilot study to confirm its effectiveness and to address potential confounds. Two hundred participants (31 with a family history of skin cancer) recruited from Amazon's Mechanical Turk were randomly assigned to complete the why versus how task, after which they completed the Behavioral Identification Form (Vallacher & Wegner, 1989). This 25-item questionnaire presents participants with an action (e.g., reading) and asks them to indicate which of two construals of that action they prefer. One description focuses on the concrete means by which the action is implemented (e.g., following lines of print), whereas the other focuses on the abstract ends the action achieves (e.g., gaining knowledge). Participants completed a scalar version of the scale, indicating their preferences using a 7-point scale in which higher numbers represented preferences for the more abstract, high-level description. As predicted, participants in the why condition (M = 4.92, SD = 1.40) preferred the more abstract descriptions as compared with those in the how condition (M = 4.61, SD = 1.22), $F(1, 197) = 4.51$, $p = .04$, $d = 0.30$ (95% CI = [0.06, 0.54]). This pattern was not moderated by relevance ($p = .16$). This confirms the efficacy of the why versus how task as a manipulation of construal level. We also assessed potential confounds, including whether the manipulation impacted the perceived importance of health goals, one's progress in advancing health goals, and perceived control over one's health behaviors. Our manipulation of construal level, relevance, and their interaction did not significantly influence any of these variables (all ps > .17).

After participants completed the why versus how task in Study 2, they then read one of two versions of a skin cancer health message (see Appendix B). Half of the participants (high changeability condition) read a message that suggested that their risk for skin cancer was the result of alterable behaviors (i.e., tanning, applying sunblock, avoiding the sun). By contrast, the other half (low changeability condition) read a message that suggested that their risk was the result of unalterable characteristics (i.e., ethnicity, gender, family history, genetics). Information that one's risk of skin cancer is based on alterable rather than unalterable characteristics should promote perceptions that one's risk of skin cancer is more changeable (e.g., Dweck & Leggett, 1988; Howell & Shepperd, 2012; Melnyk & Shepperd, 2012).

After reading the initial health message, participants were then offered the opportunity to read several supplementary messages that could bolster versus repudiate the health message they had just read. Specifically, participants were told that although they were not required to, they could read several additional articles relevant to skin cancer. They were then presented with a list of article titles from which to choose. Half of the articles were titled to suggest topics that were consistent in message and tone to the health message that they had just read ("Sun damage causes premature aging of the skin," "Sunscreen prevents skin damage from UV rays," "Tanning beds are more dangerous than natural sun exposure," and "Spray tans can give the look of a tan without the dangerous UV exposure"). The other half were titled to reference topics that were inconsistent in message and tone to the health message that they had just read ("Vitamin D from sun exposure may be beneficial," "Sunscreens do not prevent damage from UV rays," "Tanning beds offer greater benefits than tanning in the sun," and "Spray tans can be dangerous to your health"). When participants selected an article from the list of eight titles, they were then presented with the article on the computer screen. Participants could return to the original list of articles, or choose to stop reading articles, at any time. All of the articles were comparable in length (136-150 words). We recorded the amount of time participants spent reading the feedback-consistent versus feedback-inconsistent articles as a behavioral measure of participants' acceptance of negative feedback. After reading as much or as little information as they desired, participants provided demographic information and were debriefed and dismissed.

To confirm that the supplemental articles that we presented to participants were indeed perceived as consistent versus inconsistent with the initial health message, we conducted an additional pilot study. Thirty additional participants from the same population read and rated the level of consistency between the initial message and each of the subsequent articles on a 7-point scales (1 = *very inconsistent*, 7 = *very consistent*). They also rated the valence of each article (1 = *very negative*, 7 = *very positive*) and how useful each would be for change (1 = *not at all useful*, 7 = *very useful*). As predicted, the four feedback-consistent articles (M = 4.79, SD = 0.87) were perceived to be more consistent with the initial health message than the four feedback-inconsistent

articles ($M = 3.42$, $SD = 1.00$), $F(1, 29) = 40.54$, $p < .001$, $d = 2.36$ (95% CI = [1.50, 3.04]). Furthermore, the feedback-consistent information was perceived as more negative ($M = 3.47$, $SD = 0.70$) and more useful for changing one's behavior ($M = 4.81$, $SD = 0.90$) than the feedback-inconsistent information ($M = 4.05$, $SD = 0.50$ and $M = 4.13$, $SD = 0.96$, respectively), $F(1, 29) = 15.55$, $p < .001$, $d = 1.46$ (95% CI = [0.74, 2.07]) and $F(1, 29) = 20.98$, $p < .001$, $d = 1.70$ (95% CI = [0.94, 2.32]), respectively. These data support our assumptions that reading supplemental feedback-consistent articles would be perceived as having affective costs yet instrumental in promoting long-term change.

Results and Discussion

The amount of time participants spent reading the consistent versus inconsistent supplementary articles were summed as two separate scores. Although we verified that there were no outliers in these data (all log-transformed reading times fell within 3 *SD* of the mean), to adjust for skew, we log-transformed the data for all analyses (see Bargh & Chartrand, 2000). We report raw reading times in minutes, however, for ease of interpretation. We also counted the number of each respective type of article participants choose to read. Although these latter data produced similar results to the reading time analyses, they did not reach conventional levels of statistical significance (all *p*s > .19). Dichotomizing this variable and examining whether or not participants read any information using non-parametric statistics also did not yield any significant findings (all *p*s > .19).

To analyze the log-transformed reading times, we conducted a 2 (construal level: low-level vs. high-level) × 2 (changeability: low vs. high) × 2 (family history) × 2 (article type: feedback-consistent vs. feedback-inconsistent) mixed-model ANOVA with article type as a within-subjects variable. Results indicated that there was a four-way interaction of construal level, family history of skin cancer, changeability, and article type, $F(1, 117) = 3.38$, $p = .07$, $\eta_p^2 = .03$ (95% CI = [0.00, 0.09]; see Figure 2).

To interpret this interaction, we examined the data as a function of article type. Construal level, changeability, and family history appeared to have little predictive power on the amount of time spent reading feedback-inconsistent articles, $F(1, 116) = 1.62$, $p = .21$, $\eta_p^2 = .01$ (95% CI = [0.00, 0.07]). These variables, however, predicted the amount of time spent on feedback-consistent articles, $F(1, 116) = 3.82$, $p = .05$, $\eta_p^2 = .03$ (95% CI = [0.00, 0.10]). Family history and construal level jointly predicted participants' reading of feedback-consistent messages when skin cancer risk was portrayed as changeable, $F(1, 54) = 6.77$, $p = .01$, $\eta_p^2 = .11$ (95% CI = [0.01, 0.25]), but not when it was portrayed as unchangeable, $F(1, 61) = 0.02$, $p = .90$, $\eta_p^2 = .00$ (95% CI = [0.00, 0.01]). When skin cancer risk was portrayed as changeable, as predicted, those engaged in high-level ($M = 4.90$, $SD = 1.58$) relative to low-level construal ($M = 0.15$, $SD = 1.29$) spent more time reading feedback-consistent articles when they had a family history of skin cancer, $F(1, 17) = 4.79$, $p = .04$, $d = 1.06$ (95% CI = [0.13, 1.80]). No such impact of construal level was evident among those with no family history, $F(1, 36) = 2.26$, $p = .14$, $d = 0.50$ (95% CI = [0.00, 1.03]).

The results from Study 2 are important for two reasons. First, these studies replicated Study 1 using a behavioral measure, demonstrating that when exposed to negative feedback, high-level construal enhances acceptance of negative feedback, as revealed by supplementary information search behavior. Second, these results further illuminated the motivational basis for this effect. Specifically, after reading negative self-relevant (vs. irrelevant) feedback, participants engaged in high-level construal, rather than low-level construal, sought out feedback-consistent information only to the extent that the feedback addressed a domain that was perceived as changeable, rather than unchangeable. These results suggest that people's acceptance of negative feedback was indeed motivated by self-change concerns.

Studies 3A and 3B

Overview

In Studies 3A and 3B, we go beyond documenting motivational mechanisms and explore concurrent cognitive mechanisms. Specifically, by linking negative feedback to self-change rather than self-defensive motivations, high-level (relative to low-level) construal should promote interpretations of negative information as instrumental and valuable feedback (rather than an affectively painful threat) when this information is self-relevant. To examine this, in Studies 3A and 3B, participants were induced to engage in high-level or low-level construal prior to reading a skin cancer health message that depicted their risk as relatively changeable versus unchangeable. All participants then indicated their motivation to seek additional feedback-consistent information as an indicator of feedback acceptance. Critically, we also assessed their interpretation of the feedback. Replicating Study 2, we hypothesized that high-level, relative to low-level, construal would promote greater acceptance of the initial negative feedback, particularly when the feedback domain was self-relevant and perceived as changeable rather than unchangeable. Importantly, we also predicted that people would be more likely to interpret the initial negative information as instrumental and valuable feedback rather than as an affectively painful threat under these same conditions. We further predicted that this change in the interpretation of the feedback might mediate the effect of construal level on acceptance of the negative feedback.

Method

Participants. To assuage concerns that the results of Studies 1 and 2 were spurious due to relatively small sample sizes,

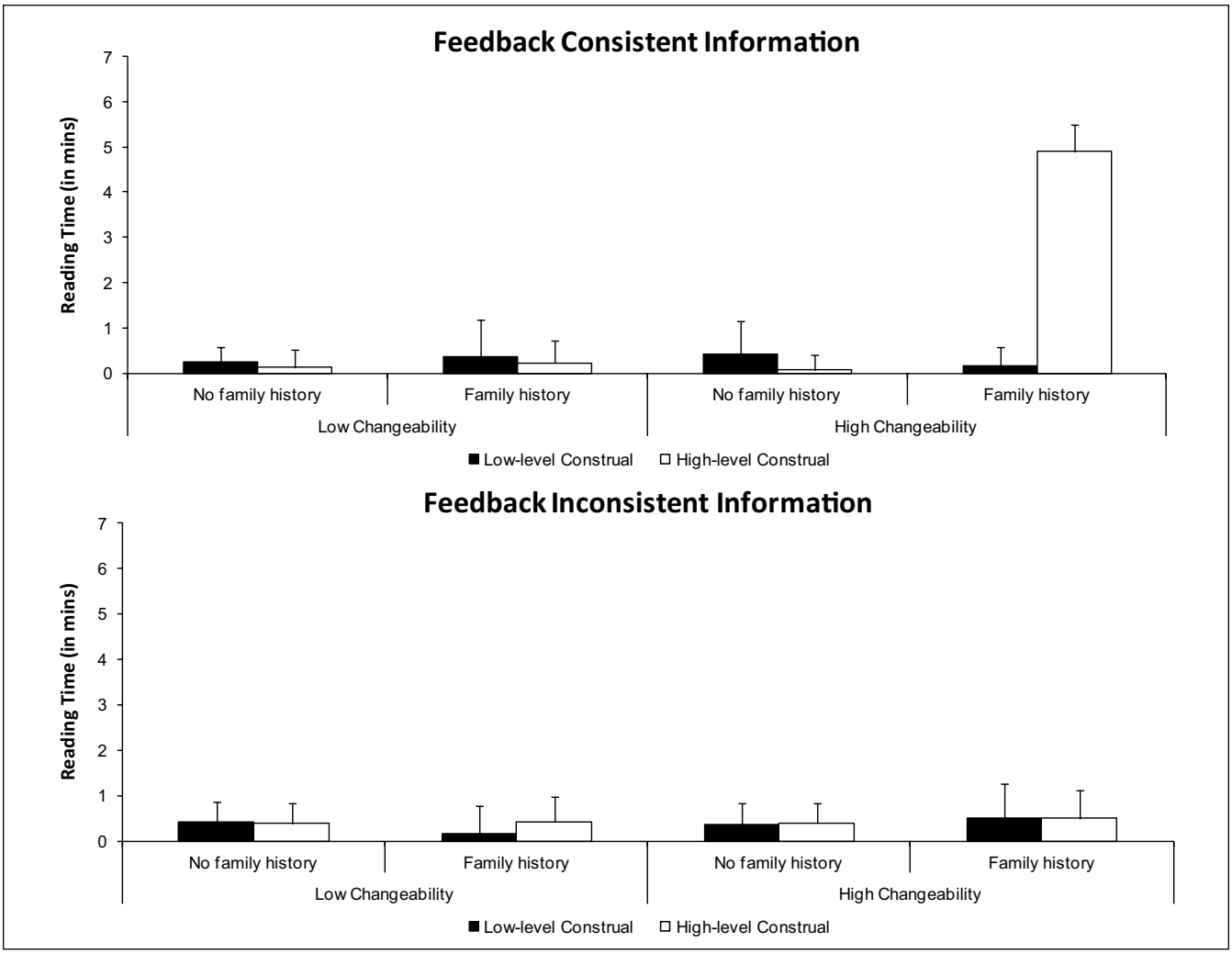

Figure 2. Post-feedback information search as a function of construal level, relevance, changeability, and article type (Study 2).
Note. Error bars indicate standard error of the mean.

given the relative ease with which to collect data using Amazon.com's Mechanical Turk, we recruited 400 workers each for Studies 3A and 3B in exchange for US$0.50. No data were analyzed until each study had accumulated all 400 participants. We excluded data from 69 participants in Study 3A and 60 participants in Study 3B because they did not meet our inclusionary criteria of being Caucasian. Participants ranged in age from 18 to 73 (M_{3A} = 34.50, SD_{3A} = 13.18; M_{3B} = 30.94, SD_{3B} = 9.94), and all resided in the United States. Furthermore, we excluded 4 participants in Study 3A who did not follow instructions, leaving a final *N* of 327 (63 tanners, 172 females). We excluded 9 participants in Study 3B who did not follow instructions and 22 who reported completing a similar study (which was in all likelihood Study 3A), leaving a final *N* of 309 (64 tanners, 110 females).

Materials and procedure. Unlike the previous two studies, participants completed the relevance measures (i.e., whether they had used a tanning bed) at the end of the study rather than at the beginning. Participants in Study 3A first completed the why–how manipulation of construal level, as used in Study 2. Participants in Study 3B, by contrast, completed the category-exemplar manipulation, as used in Study 1. All subsequent materials and procedures were identical in both studies.

Following the manipulation of construal level, participants read a skin cancer health message. Because these studies were conducted a couple of years after the previous two studies, we updated the statistics to reflect the latest information provided by the Skin Cancer Foundation (see Appendix C). To confirm that our new materials successfully manipulated perceived changeability, we collected pilot data from 35 participants, who read both versions of the message in random order. Participants rated how changeable and controllable each message portrayed the risk of skin cancer on a 7-point scale (1 = *not at all changeable, very little control*; 7 = *extremely changeable, a lot of control*). Confirming the efficacy of our manipulations, participants believed their risk

for skin cancer was more changeable after reading the high changeability (M = 4.86, SD = 1.80) as compared with the low changeability message (M = 3.29, SD = 2.07), $F(1, 34) = 16.46$, $p < .001$, $d = 1.39$ (95% CI = [0.73, 1.95]). Similarly, participants reported having more control over their risk for skin cancer after reading the high changeability (M = 5.80, SD = 1.35) as compared with the low changeability message (M = 3.69, SD = 2.31), $F(1, 34) = 27.77$, $p < .001$, $d = 1.81$ (95% CI = [1.10, 2.40]).[4]

After reading the message, as an assessment of their acceptance of the negative feedback, participants responded to several questions assessing their motivation to receive supplementary information (i.e., "How motivated are you to seek out additional information about reducing your risk for skin cancer," "How motivated are you to receive additional information about reducing your risk for skin cancer," and "How motivated are you to schedule an appointment with a dermatologist?" 1 = *not at all*, 7 = *extremely*; $\alpha_{3A} = .89$, $\alpha_{3B} = .89$). Participants then answered several items assessing their interpretation of the information as useful feedback or painful threat on a 7-point Likert-type scale (1 = *strongly disagree*, 7 = *strongly agree*). Because we were concerned that direct questions regarding interpretation of the feedback may activate reactance or social desirability in responding, we focused on the attributions about the author's intentions as indirect measure of participants' interpretation of the information. These items included "The author of this message was trying to help me understand my risk for skin cancer so I could change it" and "The author wanted to make me feel ashamed of my behavior" ($\alpha_{3A} = .89$, $\alpha_{3B} = .90$; see Appendix D). Responses were coded such that higher values represented construing the author's intentions as helpful, and lower numbers represented construing the author's intentions as threatening or hurtful.

Results and Discussion

Feedback-consistent information search motivation. We analyzed participants' motivation to seek additional feedback-consistent information as a function of construal level (high-level vs. low-level construal), relevance (tanners vs. non-tanners), and changeability (high vs. low). In Study 3A, engaging in high-level construal ($M_{3A} = 4.12$, $SD_{3A} = 1.58$) generally increased motivation to get additional information relative to low-level construal ($M_{3A} = 3.75$, $SD_{3A} = 1.72$), $F_{3A}(1, 319) = 6.11$, $p = .01$, $d = 0.28$ (95% CI = [0.09, 0.46]). There was also a tendency for non-tanners ($M_{3A} = 3.98$, $SD_{3A} = 1.65$) to be more motivated to get additional information than tanners ($M_{3A} = 3.69$, $SD_{3A} = 1.71$), $F_{3A}(1, 319) = 2.76$, $p = .10$, $d = 0.19$ (95% CI = [0.00, 0.37]). We did not replicate these effects in Study 3B. Critically, however, consistent with the results of our previous studies, we found a significant (and predicted) interaction between construal level, changeability, and relevance in both studies, $F_{3A}(1, 319) = 4.02$, $p = .05$, $\eta_p^2 = .01$ (95% CI = [0.00, 0.05]) and $F_{3B}(1, 301) = 3.81$, $p = .05$, $\eta_p^2 = .01$ (95% CI = [0.00, 0.04]; see Figure 3).

We unpacked these interactions as a function of changeability. In Study 3A, when one's risk was portrayed as unchangeable, non-tanners ($M_{3A} = 4.30$, $SD_{3A} = 1.61$) were generally more motivated than tanners to seek additional information ($M_{3A} = 3.56$, $SD_{3A} = 1.69$), $F_{3A}(1, 159) = 5.57$, $p = .02$, $d = 0.37$ (95% CI = [0.11, 0.63]). By contrast, in the same study, when one's risk was portrayed as changeable, high-level construal ($M_{3A} = 3.95$, $SD_{3A} = 1.55$) generally increased motivation to get supplementary information relative to low-level construal ($M_{3A} = 3.51$, $SD_{3A} = 1.74$), $F_{3A}(1, 160) = 7.81$, $p = .006$, $d = 0.44$ (95% CI = [0.18, 0.70]). None of these were evident in Study 3B (all ps > .38). More importantly, when risk was portrayed as changeable, we observed the predicted interaction between construal level and relevance in both studies, $F_{3A}(1, 160) = 5.54$, $p = .02$, $\eta_p^2 = .03$ (95% CI = [0.002, 0.09]) and $F_{3B}(1, 152) = 4.63$, $p = .03$, $\eta_p^2 = .03$ (95% CI = [0.001, 0.09]). Although construal level had no effect on non-tanners, $F_{3A}(1, 132) = 0.27$, $p = .61$, $d = 0.09$ (95% CI = [0.00, 0.37]) and $F_{3B}(1, 122) = 1.50$, $p = .22$, $d = 0.22$ (95% CI = [0.00, 0.52]), tanners engaged in high-level ($M_{3A} = 4.54$, $SD_{3A} = 1.59$; $M_{3B} = 3.94$, $SD_{3B} = 1.65$) relative to low-level construal ($M_{3A} = 2.81$, $SD_{3A} = 1.49$; $M_{3B} = 3.00$, $SD_{3B} = 1.33$) were more motivated to seek additional information after receiving feedback about their ostensibly changeable skin cancer risk in both studies, $F_{3A}(1, 28) = 8.96$, $p = .006$, $d = 1.13$ (95% CI = [0.44, 1.73]) and $F_{3B}(1, 30) = 3.04$, $p = .09$, $d = 0.64$ (95% CI = [0.00, 1.21]). Thus, replicating our previous findings, both Studies 3A and 3B revealed that high-level (vs. low-level) construal promoted acceptance of negative feedback to the extent that the feedback domain was perceived as changeable rather than unchangeable.

Given that Studies 3A and 3B were identical in subject population, materials, and procedures with the exception of the manner in which construal level was experimentally manipulated, we can combine and re-analyze the data with study (and, correspondingly, construal level manipulation method) as an additional factor. This combination provides a statistically more powerful test of some of the simple effects analyses reported above that did not achieve traditional standards of significance ($p < .05$). Analysis of the two datasets combined replicated the significant three-way interaction between construal level, relevance, and changeability, $F(1, 620) = 7.82$, $p = .005$, $\eta_p^2 = .01$ (95% CI = [0.001, 0.04]). Importantly, this three-way interaction was not further moderated by study, $F(1, 620) = 0.01$, $p = .91$, $\eta_p^2 = .00$ (95% CI = [0.00, 0.00]). Unpacking this three-way interaction as a function of changeability, we found that when one's risk was portrayed as unchangeable, neither construal level, relevance, nor their interaction significantly influenced motivation to get additional information (all ps > .12). When one's risk was portrayed as changeable, by contrast, high-level construal (M = 3.81, SD = 1.55) generally increased motivation to get additional information relative to low-level construal (M = 3.62, SD = 1.60), $F(1, 312) = 7.84$, $p = .005$,

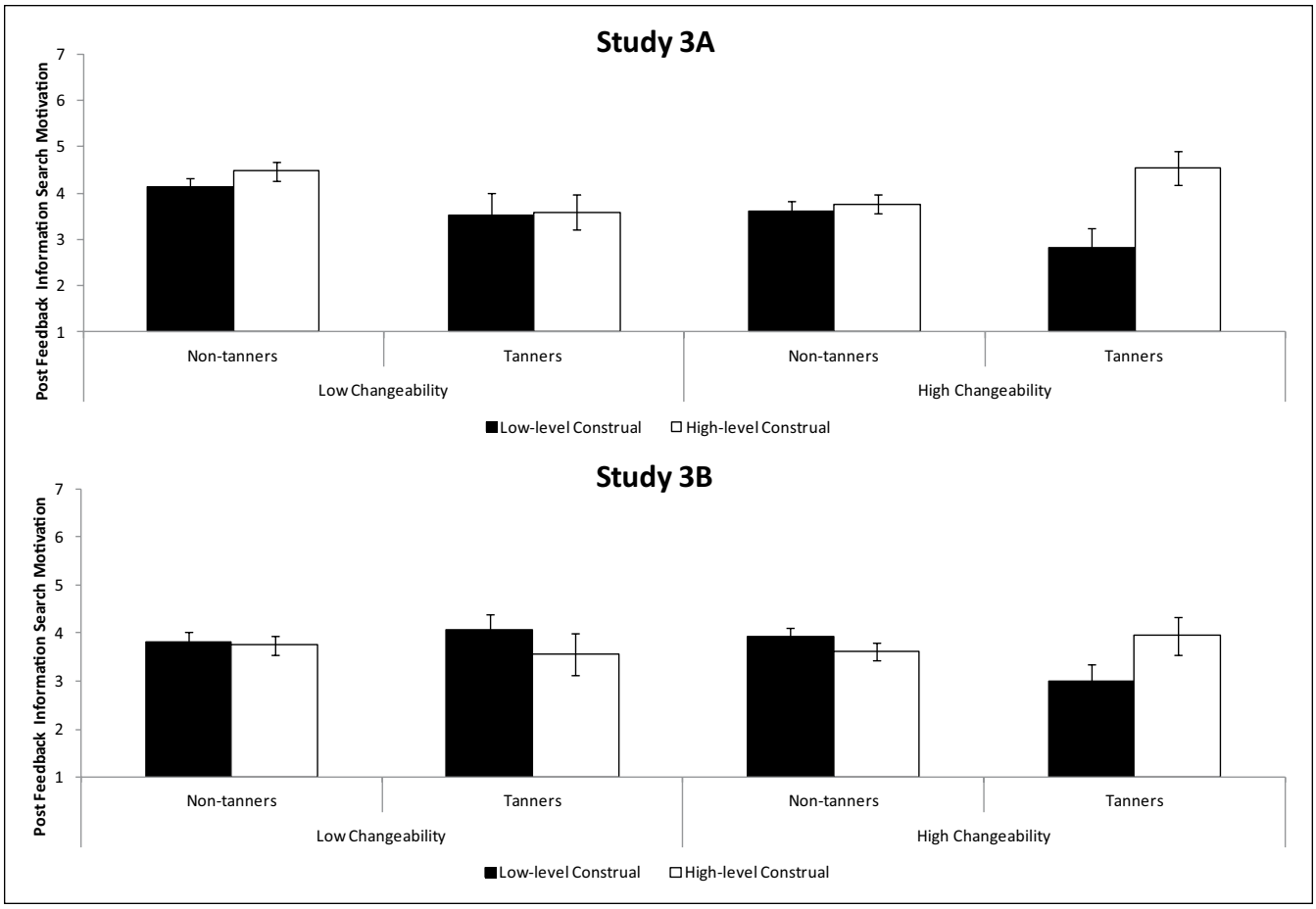

Figure 3. Post-feedback information search motivation as a function of construal level, changeability, and relevance (Study 3).
Note. Error bars indicate standard error of the mean.

η_p^2 = .03 (95% CI = [0.002, 0.07]), but this was qualified by relevance, $F(1, 312) = 10.18$, $p = .002$, η_p^2 = .03 (95% CI = [0.004, 0.08]). As we predicted, although construal level had no effect on non-tanners, $F(1, 254) = 0.20$, $p = .65$, $d = 0.06$ (95% CI = [0.00, 0.25]), tanners engaged in high-level (M = 4.24, SD = 1.63) relative to low-level construal (M = 2.91, SD = 1.38) were more motivated to seek additional information after receiving feedback about their ostensibly changeable skin cancer risk, $F(1, 58) = 11.41$, $p = .001$, $d = 0.89$ (95% CI = [0.42, 1.31]). Thus, by testing our focal hypotheses with the heightened statistical power afforded by this combined analysis, we have stronger evidence that high-level (vs. low-level) construal promoted acceptance of negative feedback to the degree that the feedback domain was perceived as changeable rather than unchangeable.

Interpretation of the author's intentions. We analyzed participants' attributions of the authors' intentions as a function of construal level (high-level vs. low-level construal), relevance (tanners vs. non-tanners), and changeability (high vs. low). In Study 3A, in general, those who were led to believe their skin cancer risk was changeable (M_{3A} = 6.07, SD_{3A} = 0.67) rather than unchangeable (M_{3A} = 5.63, SD_{3A} = 0.95) were more likely to interpret the author's intentions as more helpful rather than threatening, $F_{3A}(1, 319) = 17.72$, $p < .001$, d = 0.47 (95% CI = [0.28, 0.66]). Construal level moderated this effect, $F(1, 319) = 4.51$, $p = .03$, η_p^2 = .03 (95% CI = [0.001, 0.04]): Those engaged in low-level construal were insensitive to differences in changeability, $F_{3A}(1, 167) = 2.06$, p = .15, d = 0.22 (95% CI = [0.00, 0.47]), whereas those engaged in high-level construal perceived feedback about changeable risks (M_{3A} = 6.10, SD_{3A} = 0.71) to be more helpful than unchangeable risks (M_{3A} = 5.55, SD_{3A} = 0.95), $F_{3A}(1, 152)$ = 21.22, $p < .001$, d = 0.75 (95% CI = [0.47, 1.02]). Somewhat unexpectedly, these patterns were reversed in Study 3B. In general, those who believed that their risk for skin cancer was changeable (M_{3B} = 5.61, SD_{3B} = 0.91) rather than unchangeable (M_{3B} = 5.92, SD_{3B} = 0.72) were less likely to interpret the author's intentions as more helpful rather than threatening, $F_{3B}(1, 301) = 2.86$, $p = .09$, $d = 0.19$ (95% CI = [0.00, 0.38]). Construal level, however, moderated this effect, such that those engaged in high-level construal were

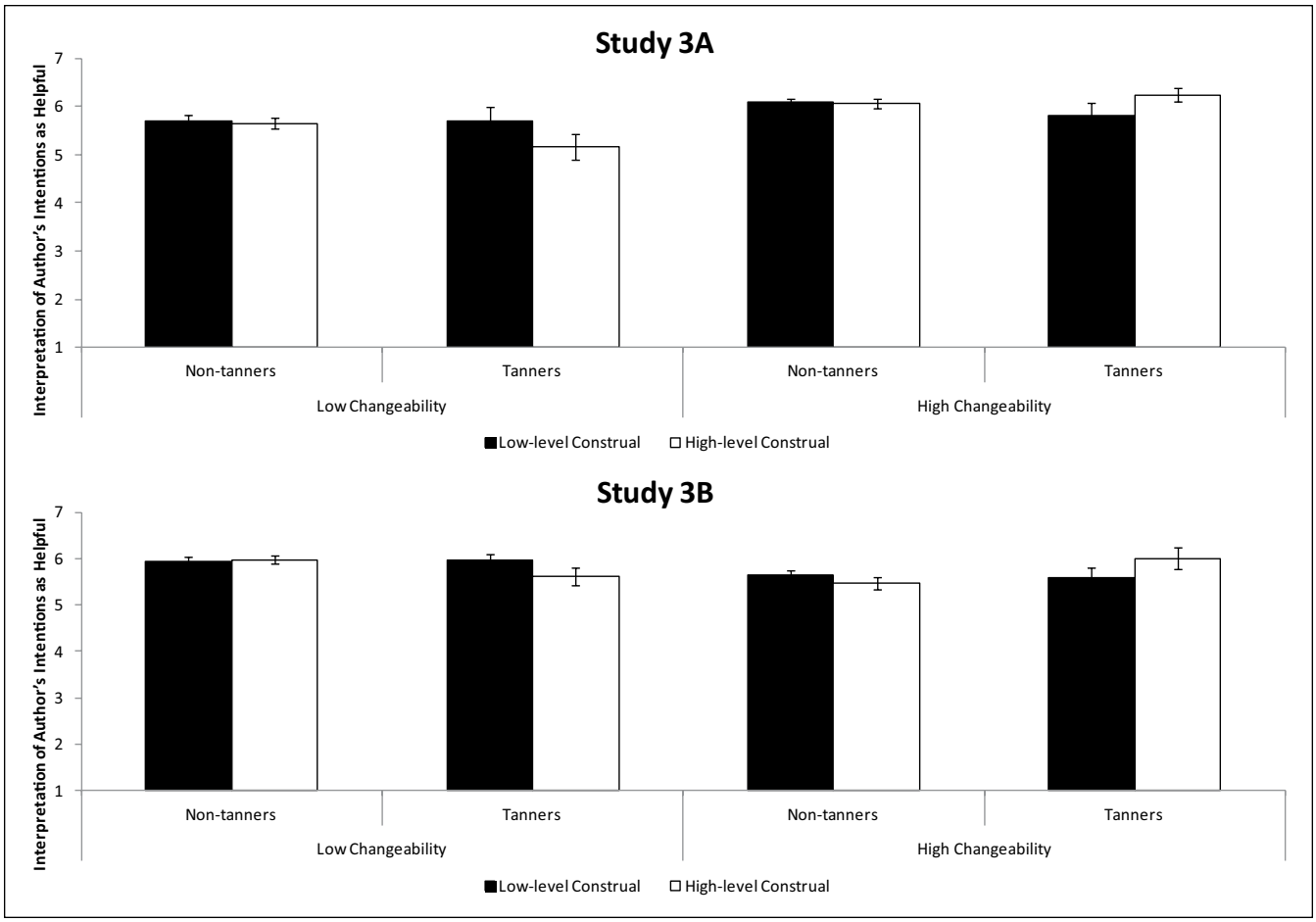

Figure 4. Interpretation of the negative feedback as helpful as a function of construal level, relevance, and changeability (Study 3).
Note. Error bars indicate standard error of the mean.

insensitive to differences in changeability, $F_{3B}(1, 156) = 0.12$, $p = .73$, $d = 0.06$ (95% CI = [0.00, 0.30]), whereas for those engaged in low-level construal, feedback about unchangeable ($M_{3B} = 5.94$, $SD_{3B} = 0.74$) rather than changeable risks ($M_{3B} = 5.64$, $SD_{3B} = 0.73$) was perceived as more helpful, $F_{3B}(1, 145) = 4.82$, $p = .03$, $d = 0.36$ (95% CI = [0.08, 0.64]). Critically, as predicted, construal level, relevance, and changeability interacted to influence participants' interpretation of the author's intentions in both Study 3A, $F_{3A}(1, 319) = 4.12$, $p = .04$, $\eta_p^2 = .01$ (95% CI = [0.00, 0.04]), and Study 3B, $F_{3B}(1, 301) = 4.55$, $p = .03$, $\eta_p^2 = .02$ (95% CI = [0.001, 0.05]; see Figure 4).

To interpret these interactions, we analyzed the data as a function of changeability. When one's risk was portrayed as unchangeable, there were no significant effects of construal level or relevance on interpretation of the author's intentions (all $ps_{3A} > .11$ and $ps_{3B} > .17$). However, when one's risk was portrayed as changeable, construal level and tanning status jointly predicted participants' interpretation of the author's intentions, $F_{3A}(1, 160) = 2.83$, $p < .10$, $\eta_p^2 = .02$ (95% CI = [0.00, 0.06]) and $F_{3B}(1, 152) = 2.71$, $p = .10$, $\eta_p^2 = .02$ (95% CI = [0.00, 0.07]). None of the specific focal comparisons reached conventional levels of significance in either study, although inspection of the general pattern of results supported our predictions. Whereas construal level had little impact on non-tanners, $F_{3A}(1, 132) = 0.08$, $p = .78$, $d = 0.05$ (95% CI = [0.00, 0.30]) and $F_{3B}(1, 122) = 1.23$, $p = .27$, $d = 0.20$ (95% CI = [0.00, 0.49]), engaging in high-level relative to low-level construal promoted interpreting the author's intentions as helpful rather than threatening among tanners, $F_{3A}(1, 28) = 2.51$, $p = .12$, $d = 0.60$ (95% CI = [0.00, 1.19]) and $F_{3B}(1, 30) = 1.83$, $p = .19$, $d = 0.49$ (95% CI = [0.00, 1.06]).

We again tested our hypotheses with the enhanced statistical power afforded by combining the data from these two studies. As predicted, construal level, relevance, and changeability interacted to influence participants' interpretation of the author's intentions, $F(1, 620) = 8.66$, $p = .003$, $\eta_p^2 = .01$ (95% CI = [0.002, 0.03]). Importantly, this three-way interaction was not further moderated by study, $F(1, 620) = 0.00$, $p = .95$, $\eta_p^2 = .00$ (95% CI = 0.00, 0.00]). To interpret this three-way interaction, we examined the data as a function of changeability. Most germane to our hypotheses, we found that construal level and relevance jointly influenced interpretations of the authors' intentions when one's risk was

changeable, $F(1, 312) = 5.42$, $p = .02$, $\eta_p^2 = .02$ (95% CI = [0.001, 0.05]). When cancer risk was presented as changeable, construal level had little impact on non-tanners, $F(1, 254) = 1.17$, $p = .28$, $d = 0.14$ (95% CI = [0.00, 0.34]), whereas among tanners, engaging in high-level ($M = 6.12$, $SD = 0.75$) relative to low-level ($M = 5.69$, $SD = 0.85$) construal promoted interpreting the author's intentions as helpful rather than threatening, $F(1, 58) = 4.22$, $p = .05$, $d = 0.54$ (95% CI = [0.06, 0.96]). If anything, this pattern appeared to reverse when cancer risk was presented as unchangeable: Tanners engaged in low-level construal ($M = 5.84$, $SD = 0.87$) tended to view the authors' intentions as helpful rather than harmful more than those engaged in high-level construal ($M = 5.39$, $SD = 0.98$), $F(1, 61) = 3.72$, $p = .06$, $d = 0.49$ (95% CI = [0.00, 0.90]). This effect was not true of non-tanners, $F(1, 247) = 0.01$, $p = .94$, $d = 0.00$ (95% CI = [0.00, 0.08]). This unexpected reversal might suggest that tanners engaged in high-level relative to low-level construal may have recognized their risk of skin cancer but were troubled that the author provided no practicable ways for them to decrease that risk. Nevertheless, taking these data as a whole, using the increased statistical power that is afforded by combining both datasets, we have stronger evidence that high-level (vs. low-level) construal promotes interpreting negative information about changeable (vs. unchangeable) weaknesses as helpful feedback.

Mediation. To explore interpretations of authors' intentions as a potential mediator, we tested the indirect effect of the interaction between construal level, relevance, and changeability on feedback acceptance (as assessed by motivation for additional feedback-consistent information) through interpretation of the author's intentions using bias-corrected boot-strapping procedures ($n = 1{,}000$) to generate 95% CIs (Preacher & Hayes, 2008; Shrout & Bolger, 2002). These analyses revealed a statistically significant indirect effect in both studies: $\beta_{3A\text{–Indirect}} = 0.04$, CI = [0.001, 0.10] and $\beta_{3B\text{–Indirect}} = 0.03$, CI = [0.002, 0.083] (see Figure 5 and Table 1). Furthermore, combining the data from the two studies yielded the same effect, $\beta = .03$, CI = [0.008, 0.066]. These results provide preliminary evidence that participants' interpretations of the author's intentions may mediate the effect of construal level, relevance, and changeability on feedback acceptance. More broadly, these data are consistent with our proposal that a change in the meaning of the information leads people engaged in high-level relative to low-level construal to accept negative feedback. Rather than represent something painful, high-level construal may promote understanding that negative information is valuable and useful feedback.[5]

General Discussion

In the present research, we examined the conditions that lead people to pursue self-change rather than self-protection when confronted with negative self-relevant information. Four studies showed that high-level construal increased motivation for self-change relative to low-level construal when the information was self-relevant and change was possible. Specifically, when exposed to initial negative feedback, participants engaged in high-level, relative to low-level, construal evidenced enhanced acceptance of negative feedback. We also examined the cognitive and motivational mechanisms set into motion by high-level construal.

The current research extends past work in two important ways. First, we demonstrate that differences in construal level not only change people's willingness to seek out and expose themselves to initial diagnostic negative information but also influence how they respond to such information when exposed to it. As noted earlier, this represents a more critical test of the dual-motive model, as both self-change and self-protection concerns are more acutely activated when directly exposed to negative feedback. Even in this more highly charged state, high-level (vs. low-level) construal appears to promote self-change over self-protection concerns. These findings thus promote an understanding of people's reactions to negative diagnostic information when such information cannot be avoided and help to provide a more complete picture of when people engage in self-protection versus self-change.

Second, the present research highlights motivational relevance and the perceived changeability of the feedback domain as two critical moderators for the acceptance of negative information. High-level construal is not a panacea for increasing assimilation of negative feedback. Indeed, as noted previously, high-level construal promotes greater openness to negative information only to the extent that the information is perceived as motivationally relevant and instrumental in promoting self-change. Thus, the present results not only suggest the important role of construal in how people respond to negative information but also highlight two critical boundary conditions. Future research might test whether these factors moderate the effect of construal on information exposure in the same manner as it moderates the effect of construal on negative feedback acceptance.

The present findings may speak to research on self-affirmation. Extensive research has shown that affirming one's core values increases openness to negative self-relevant information (e.g., Epton & Harris, 2008; Harris & Napper, 2005; Sherman et al., 2000). The precise mechanisms by which this self-affirmation exerts its effect, however, are not well understood (e.g., Sherman & Cohen, 2006). Emerging research suggests that one consequence of affirming one's values may be the construal of events in higher-level rather than lower-level terms (e.g., Schmeichel & Vohs, 2009; Wakslak & Trope, 2009). For example, Wakslak and Trope (2009) found that after completing a values-affirmation manipulation, participants were more likely to identify behaviors in terms of the superordinate end-states they achieve as opposed to subordinate means by which

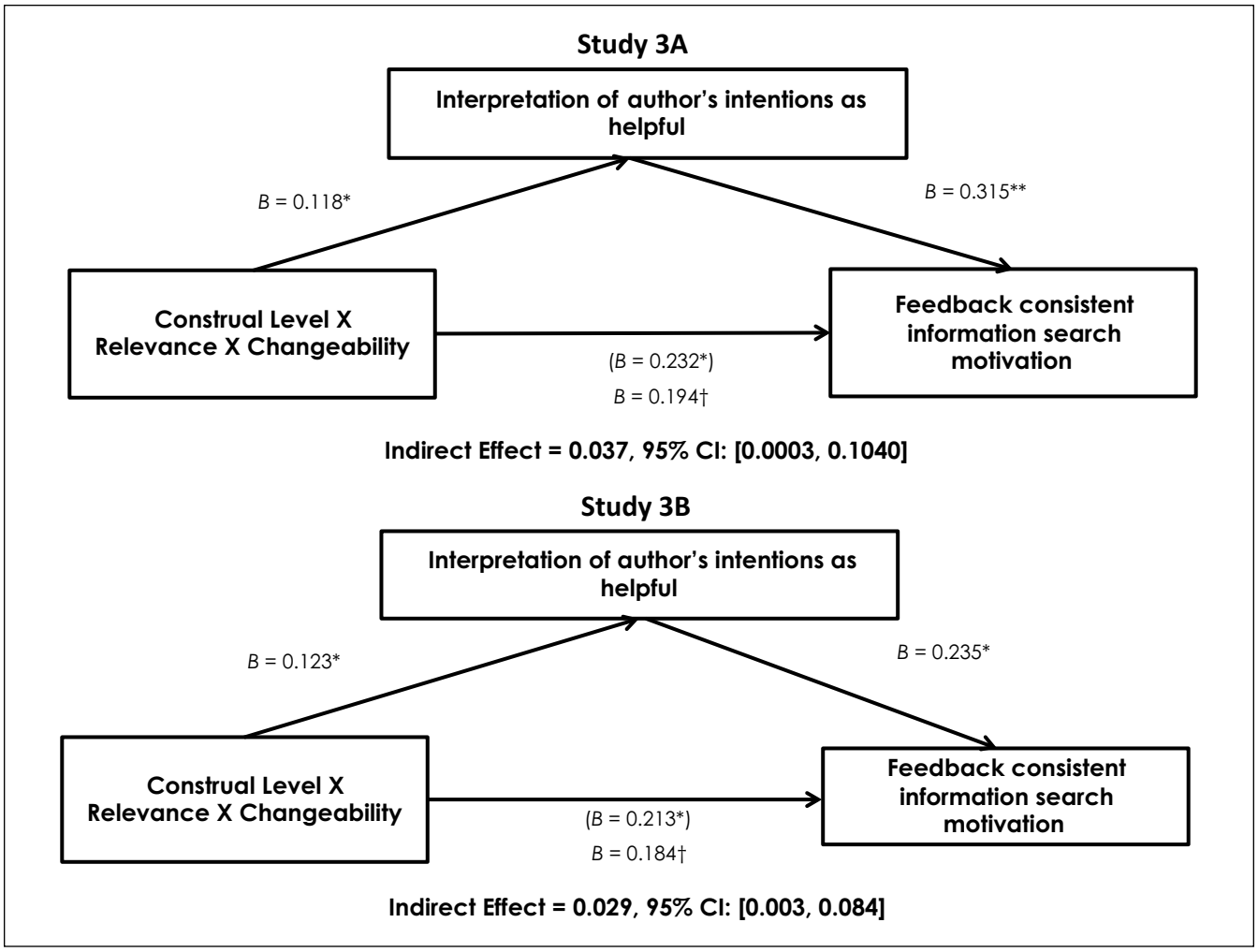

Figure 5. Interpretation of the negative feedback as helpful as a mediator of the interactive effect of construal level, changeability, and relevance on post-feedback information search motivation (Studies 3A and 3B).
Note. The figure shows the standardized regression coefficients, which were estimated using methods by Shrout and Bolger (2002). For the path between the three-way interaction and motivation to reduce risk, the coefficient in parenthesis shows the result when the mediator was not included in the model, and the other coefficient shows the result when the mediator was included in the model. CI = confidence interval.
Asterisks indicate coefficients that were significantly different from 0 ($^{\dagger}p \leq .10$. $^{*}p \leq .05$).

Table 1. Correlations Between the Three Orthogonal Independent Variables, Interpretation of the Author's Feedback as Helpful Versus Harmful, and Self-Change Motivation in Studies 3A and 3B.

	Study 3A		Study 3B		Combined 3A and 3B	
	IAF	SCM	IAF	SCM	IAF	SCM
Construal level	−0.04	0.11*	−0.04	−0.04	−0.04	0.04
Changeability	0.26**	−0.14*	−0.19**	−0.02	0.05	−0.09*
Relevance	0.07	0.07	−0.03	0.03	0.02	0.05
IAF as helpful	1.00	0.13*	1.00	0.14*	1.00	0.14**
SCM	0.13*	1.00	0.14*	1.00	0.14**	1.00

Note. IAF = interpretation of author's feedback; SCM = self-change motivation.
$^{*}p \leq .05$. $^{**}p \leq .01$.

to perform them. Combined with these past findings, the present research may suggest that a change in construal level may be one mechanism by which self-affirmation enhances receptivity to negative feedback. Self-affirmation may promote high-level rather than low-level construal, which in turn set into motion the processes that we have attempted to document in the present research.

More broadly, the present work may provide an integrative theoretical framework for understanding when people will be open to and accept negative diagnostic information. Beyond self-affirmation, any factor that promotes high-level over low-level construal should enhance openness to negative feedback. As noted earlier, research on CLT highlights psychological distance as a critical determinant of construal level. Distancing diagnostic negative information in time, space, social distance, and hypotheticality should have analogous results to those presented in this article. Thus, CLT predicts that people will advise their friends (who are socially distant relative to one's self) to accept negative feedback whereas they might dismiss the same feedback for themselves (e.g., Weinstein, 1983). Similarly, they should be more open to negative information when it is presented as hypothetical than real.

Research has also highlighted numerous factors beyond self-affirmation and psychological distance that appear to affect construal level. For example, research suggests that positive versus negative mood promotes high-level versus low-level construal, respectively (e.g., Gasper & Clore, 2002). Intriguingly, positive moods have also been shown to enhance openness to self-threatening information (e.g., Raghunathan & Trope, 2002; Trope & Neter, 1994). Our theoretical perspective would suggest a change in construal level may be one possible mechanism for this latter finding. A number of other factors have been also been shown to promote high-level versus low-level construal, respectively, such as third- versus first-person visual perspective (Libby, Shaeffer, & Eibach, 2009), abstract versus concrete language (Semin & Fiedler, 1988), and even high versus low ceilings (Meyers-Levy & Zhu, 2007). Each of these might be expected to enhance openness to negative diagnostic information. Thus, the present theoretical perspective may be able to integrate past findings under a single integrative framework and be used to generate novel research hypotheses.

In addition to theoretical contributions, this work has important pragmatic implications for anyone interested in reducing the defensive responses that serve as barriers to self-change. The present research focused on responses to health communications, an important domain in which defensive dismissal of negative information has significant health and financial costs. We might expect similar findings, however, for any domain for which the dynamic between self-change and self-protection motivations is relevant. Future research, for example, might seek to develop more ecologically valid interventions that effectively promote high-level over low-level construal of settings that may provide the diagnostic negative information necessary for self-change. Furthermore, beyond post-feedback information search, future research might investigate other behavioral efforts at self-change. It remains to be demonstrated, for example, whether high-level, relative to low-level, construal of health messages actually promotes preventive health behaviors and promotes better health. The present research suggests that helping people to take a psychological "step back" and to "view the forest instead of the individual trees" may indeed help to promote such self-change efforts by reducing interference from self-protection concerns.

Appendix A

Skin cancer is the most commonly diagnosed cancer in the United States. There are more than a million cases of skin cancer diagnosed each year. There are three distinct types of skin cancer. Melanoma is the most serious form of skin cancer that claims as many as 8,650 lives per year. Approximately 69,000 cases were diagnosed in 2009 alone.

Skin cancer occurs when the body is exposed to ultraviolet (UV) light, typically from *both* the sun or a tanning bed. Both UVA and UVB rays can damage your skin. A suntan is produced because your skin tries to block harmful UV light. A suntan is actually indicating that your skin is being damaged. It is important to remember that any exposure to harmful UV rays, whether by the sun or by a tanning bed, significantly increases your risk of skin cancer. This can occur even in the winter months because UV damage accumulates over time.

There are many risk factors associated with skin cancer. Factors that are known to increase skin cancer risk include tanning behaviors, not wearing protective clothing, and failure to use and apply sunblock products. Individuals who tan and do not put on adequate protection are at a higher risk for skin cancer. This means that people who tan are more likely to be diagnosed with and die from skin cancer.

Appendix B

High Changeability Message

Skin cancer is the most commonly diagnosed cancer in the United States. There are more than a million cases of skin cancer diagnosed each year. There are three distinct types of skin cancer. Melanoma is the most serious form of skin cancer that claims as many as 8,650 lives per year. Approximately 69,000 cases were diagnosed in 2009 alone.

Skin cancer occurs when the body is exposed to ultraviolet (UV) light, typically from *both* the sun or a tanning bed. Both UVA and UVB rays can damage your skin. A suntan is produced because your skin tries to block harmful UV light. A suntan is actually indicating that your skin is being damaged.

It is important to remember that any exposure to harmful UV rays, whether by the sun or by a tanning bed, significantly increases your risk of skin cancer.

There are many risk factors associated with skin cancer. Factors that are known to increase skin cancer risk include tanning behaviors, not wearing protective clothing, and failure to use and apply sunblock products. Individuals who tan and do not put on adequate protection are at a higher risk for skin cancer. This means that people who tan are more likely to be diagnosed with and die from skin cancer.

Low Changeability Message

Skin cancer is the most commonly diagnosed cancer in the United States. There are more than a million cases of skin cancer diagnosed each year. There are three distinct types of skin cancer. Melanoma is the most serious form of skin cancer that claims as many as 8,650 lives per year. Approximately 69,000 cases were diagnosed in 2009 alone.

Skin cancer occurs when the body is exposed to UV light, typically from *both* the sun or a tanning bed. Both UVA and UVB rays can damage your skin. A suntan is produced because your skin tries to block harmful UV light. A suntan is actually indicating that your skin is being damaged. It is important to remember that any exposure to harmful UV rays, whether by the sun or by a tanning bed, significantly increases your risk of skin cancer.

There are many risk factors associated with skin cancer. Factors that are known to increase skin cancer risk include genetics, family history of skin cancer, age, and race. Individuals who have light skin color or family history are at a higher risk for skin cancer. This means that people who are light-skinned are much more likely to be diagnosed with and die from skin cancer.

Appendix C

High Changeability Message

Skin cancer is the most common form of cancer in the United States. There are more than 3.5 million cases of skin cancer diagnosed each year. In fact, each year there are more new cases of skin cancer than lung, breast, prostate, and colon cancer *combined!* One in five Americans will develop skin cancer in the course of their lifetime. The American Cancer Society estimates that there will be more than 9,000 deaths in the United States in 2013.

About 86% of melanoma skin cancers are due to exposure to ultraviolet (UV) radiation from the sun alone. Tanning beds are a unique form of UV radiation that dramatically increase your risk for skin cancer. This UV light causes people to develop darker skin, or tans, because your skin tries to block the harmful UV light. Therefore, each time you get a suntan, your skin is being damaged. It is important to remember that any exposure to harmful UV rays, whether by the sun or by a tanning bed, significantly increases your risk of skin cancer. This can occur even in the winter months because UV damage accumulates over time.

There are many risk factors associated with skin cancer. Just one indoor tanning session increases users' chances of developing melanoma by 20%, and each additional session during the same year boosts the risk by almost another 2%. If you go tanning only 5 times throughout the year, your risk for skin cancer is 30% higher than if you choose not to tan. Therefore, your risk for skin cancer is something you can control. If you choose to wear protective clothing, apply sunblock regularly, and avoid UV radiation, you will be able to reduce your risk you already have due to UV exposure.

Low Changeability Message

Skin cancer is the most common form of cancer in the United States. There are more than 3.5 million cases of skin cancer diagnosed each year. In fact, each year there are more new cases of skin cancer than lung, breast, prostate, and colon cancer *combined!* One in five Americans will develop skin cancer in the course of their lifetime. The American Cancer Society estimates that there will be more than 9,000 deaths in the United States in 2013.

About 86% of melanoma skin cancers are due to exposure to UV radiation from the sun alone. Tanning beds are a unique form of UV radiation that dramatically increase your risk for skin cancer. This UV light causes people to develop darker skin, or tans, because your skin tries to block the harmful UV light. Therefore, each time you get a suntan, your skin is being damaged. It is important to remember that any exposure to harmful UV rays, whether by the sun or by a tanning bed, significantly increases your risk of skin cancer. This can occur even in the winter months because UV damage accumulates over time.

There are many risk factors associated with skin cancer. Just one blistering sunburn in childhood or adolescence more than doubles a person's chances of developing melanoma later in life! Even if you had sunburns as a child that didn't blister, it only takes five sunburns over a lifetime doubles one's chances of developing melanoma. Therefore, your risk for skin cancer is something you can't control. If you choose to wear protective clothing, apply sunblock regularly, and avoid UV radiation, you won't be able to reduce the risk you already have due to your childhood sun exposure.

Appendix D

Motivation to Get Additional Information Items

Please use the following scale to answer each question:

1	2	3	4	5	6	7
Not at all						*Extremely*

1. How motivated are you to seek out additional information about reducing your risk for skin cancer?
2. How motivated are you to receive additional information about reducing your risk for skin cancer?
3. How motivated are you to schedule an appointment with a dermatologist?

Construal of the Message Items

Please use the following scale to indicate your agreement/disagreement with each statement:

1	2	3	4	5	6	7
Strongly disagree	*Disagree*	*Somewhat disagree*	*Neither agree nor disagree*	*Somewhat agree*	*Agree*	*Strongly agree*

1. The author wanted to make me look foolish with this message.*
2. The author wanted to make me feel ashamed of my behavior.*
3. The author wanted to make me feel embarrassed after reading this message.*
4. The author wanted to make me feel uncomfortable when reading this message.*
5. The author wrote this information to make me recognize a problem so that I could fix it.
6. The author was trying to help me improve my health.
7. The author wanted to make me realize I am at risk for skin cancer so that I can be careful about my behavior and reduce my risk.
8. The author of this message was trying to help me understand my risk for skin cancer so I could change it.
9. The author wanted to educate me about skin cancer with this message.
10. The author wanted to enlighten me about my risk for skin cancer with this message.
11. The author wanted to impart knowledge about my risk for skin cancer with this message.
12. The author wanted to explain my risk for skin cancer with this message.

Note. Items with an asterisk indicate reverse-scored items.

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Notes

1. Agrawal and Wan (2009) have argued that processing of self-relevant health risk messages depletes self-regulatory resources (e.g., Muraven & Baumeister, 2000). They have shown that processing self-relevant health messages in one domain (e.g., Hepatitis C) reduces processing of subsequent health messages in a different domain (e.g., dental hygiene). Interposing a manipulation of high-level (vs. low-level) construal between the two health messages, however, reduced the deleterious effects of regulatory resource depletion and enhanced processing of the second message. Although this is consistent with our claim that high-level construal may enhance processing of negative self-relevant information, a direct link to the present work is difficult due to the manipulation of regulatory resource depletion. Agrawal and Wan found no effect of construal level in the absence of regulatory resource depletion, which represents the context that we examine in the present studies. We suspect that the perceived changeability of the feedback domain may explain why we find an effect of construal level under conditions in which they did not.
2. It is important to stress here that we assessed information search behavior as a response to people's acceptance of negative feedback. Note that this is distinct from the information avoidance decisions studied by Freitas, Salovey, and Liberman (2001) and Rim and Summerville (2014), in which people sought out or avoided negative information in the absence of ongoing self-threat.
3. We measured family history of skin cancer in the other studies as well. In Studies 1, 3A, and 3B, although the pattern of results is generally similar when analyzing the data using family history as an operationalization for relevance, the effects were not statistically significant. We might note that tanning behavior is a more proximal and direct risk factor for skin cancer and, therefore, may capture more effectively the conceptual essence of motivational relevance than family history. We might also add that using tanning behavior, despite the low n, rather than family history in Study 2 as our operationalization of relevance led to the same predicted pattern of results, although not at the standards of traditional statistical significance, likely due to a lack of statistical power.
4. One concern that was raised in the review process was that the low changeability message may have been more confusing or "mixed" than the high changeability message. However, in this same pilot study, participants did not report that one message was more confusing, $F(1, 34) = 2.15$, $p = .15$, $d = 0.50$ (95% confidence interval [CI] = [0.00, 1.04]), or more clear, $F(1, 34) = 0.38$, $p = .54$, $d = 0.21$ (95% CI = [0.00, 0.75]), than the other.
5. Mediational analyses are correlational in nature and must be interpreted with caution (see Fiedler, Schott, & Meiser, 2011). We cannot rule out the possibility that some unmeasured variable that correlates with our hypothesized mediator represents the "true" mediator. It is, however, unclear to us what this other variable might be. For the time being, then, we believe our theory-based interpretation of our results would appear reasonable.

Supplemental Material

The online supplemental material is available at http://pspb.sagepub.com/supplemental.

References

Agrawal, N., & Wan, E. (2009). Regulating risk or risking regulation? Construal levels and depletion effects in the processing of

health messages. *Journal of Consumer Research*, *36*, 448-462. doi:10.1086/597331

Bargh, J. A., & Chartrand, T. L. (2000). The mind in the middle. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 253-285). New York, NY: Cambridge University Press.

Ditto, P., & Lopez, D. F. (1992). Motivated skepticism: Use of differential decision criteria for preferred and nonpreferred conclusions. *Journal of Personality and Social Psychology*, *63*, 568-584. doi:10.1037/0022-3514.63.4.568

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, *95*, 256-273.doi:10.1037/0033-295X.95.2.256

Epton, T., & Harris, P. R. (2008). Self-affirmation promotes health behavior change. *Health Psychology*, *27*, 746-752. doi:10.1037/0278-6133.27.6.746

Eyal, T., Sagristano, M. D., Trope, Y., Liberman, N., & Chaiken, S. (2009). When values matter: Expressing values in behavioral intentions for the near vs. distant future. *Journal of Experimental Social Psychology*, *45*, 35-43. doi:10.1016/j.jesp.2008.07.023

Fiedler, K., Schott, M., & Meiser, T. (2011). What mediation analysis can (not) do. *Journal of Experimental Social Psychology*, *47*, 1231-1236. doi:10.1016/j.jesp.2011.05.007

Freitas, A. L., Gollwitzer, P., & Trope, Y. (2004). The influence of abstract and concrete mindsets on anticipating and guiding others' self-regulatory efforts. *Journal of Experimental Social Psychology*, *40*, 739-752. doi:10.1016/j.jesp.2004.04.003

Freitas, A. L., Salovey, P., & Liberman, N. (2001). Abstract and concrete self-evaluative goals. *Journal of Personality and Social Psychology*, *80*, 410-424. doi:10.1037/0022-3514.80.3.410

Fujita, K., & Han, H. A. (2009). Moving beyond deliberative control of impulses: The effect of construal levels on evaluative associations in self-control conflicts. *Psychological Science*, *20*, 799-804. doi:10.1111/j.1467-9280.2009.02372.x

Fujita, K., Trope, Y., Liberman, N., & Levin-Sagi, M. (2006). Construal levels and self-control. *Journal of Personality and Social Psychology*, *90*, 351-367. doi:10.1037/0022-3514.90.3.351

Gasper, K., & Clore, G. L. (2002). Attending to the big picture: Mood and global versus local processing of visual information. *Psychological Science*, *13*, 34-40. doi:10.1111/1467-9280.00406

Harris, P. R., & Napper, L. (2005). Self-affirmation and the biased processing of threatening health-risk information. *Personality and Social Psychology Bulletin*, *31*, 1250-1263. doi:10.1177/0146167205274694

Howell, J. L., & Shepperd, J. A. (2012). Reducing information avoidance through affirmation. *Psychological Science*, *23*, 141-145.

Johnson, I. R., & Fujita, K. (2012). Change we can believe in: Using perceptions of changeability to promote system-change motives over system-justification motives in information search. *Psychological Science*, *23*, 133-140.

Libby, L. K., Shaeffer, E. M., & Eibach, R. P. (2009). Seeing meaning in action: A bidirectional link between visual perspective and action identification level. *Journal of Experimental Social Psychology*, *138*, 503-516. doi:10.1037/a0016795

Melnyk, D., & Shepperd, J. A. (2012). Avoiding risk information about breast cancer. *Annals of Behavioral Medicine*, *44*, 216-224. doi:10.1007/s12160-012-9382-5

Meyers-Levy, J., & Zhu, R. (2007). The influence of ceiling height: The effect of priming on the type of processing that people use. *Journal of Consumer Research*, *34*, 174-186. doi:10.1086/519146

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin*, *126*, 247-259. doi:10.1037/0033-2909.126.2.247

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*, 879-891. doi:10.3758/BRM.40.3.879

Raghunathan, R., & Trope, Y. (2002). Walking the tightrope between feeling good and being accurate: Mood as a resource in processing persuasive messages. *Journal of Personality and Social Psychology*, *83*, 510-525. doi:10.1037/0022-3514.83.3.510

Rim, S., & Summerville, A. (2014). How far to the road not taken? The effect of psychological distance on counterfactual generation. *Personality and Social Psychology Bulletin*, *40*, 391-401. doi:10.1177/0146167213513304

Schmeichel, B. J., & Vohs, K. (2009). Self-affirmation and self-control: Affirming core values counteracts ego depletion. *Journal of Personality and Social Psychology*, *96*, 770-782. doi:10.1037/a0014635

Sedikides, C., & Hepper, E. G. D. (2009). Self-improvement. *Social & Personality Psychology Compass*, *3*, 899-917. doi:10.1111/j.1751-9004.2009.00231.x

Sedikides, C., & Strube, M. J. (1997). Self-evaluation: To thine own self be good, to thine own self be sure, to thine own self be true, and to thine own self be better. *Advances in Experimental Social Psychology*, *29*, 209-269. doi:10.1016/S0065-2601(08)60018-0

Semin, G. R., & Fiedler, K. (1988). The cognitive functions of linguistic categories in describing persons: Social cognition and language. *Journal of Personality and Social Psychology*, *54*, 558-568. doi:10.1037/0022-3514.54.4.558

Sherman, D. A. K., & Cohen, G. L. (2006). The psychology of self-defense: Self-affirmation theory. *Advances in Experimental Social Psychology*, *38*, 183-242. doi:10.1016/S0065-2601(06)38004-5

Sherman, D. A. K., Nelson, L. D., & Steele, C. M. (2000). Do messages about health risks threaten the self? Increasing the acceptance of threatening health messages via self-affirmation. *Personality and Social Psychology Bulletin*, *26*, 1046-1058. doi:10.1177/01461672002611003

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, *7*, 422-445. doi:10.1037/1082-989X.7.4.422

Taylor, S. E., Neter, E., & Wayment, H. A. (1995). Self-evaluation processes. *Personality and Social Psychology Bulletin*, *21*, 1278-1287. doi:10.1177/01461672952112005

Torelli, C. J., & Kaikati, A. M. (2009). Values as predictors of judgments and behaviors: The role of abstract and concrete mindsets. *Journal of Personality and Social Psychology*, *96*, 231-247. doi:10.1037/a0013836

Trope, Y., Ferguson, M., & Raghunathan, R. (2001). Mood as a resource in processing self-relevant information. In J. P. Forgas (Ed.), *Handbook of affect and social cognition* (pp. 256-274). Mahwah, NJ: Lawrence Erlbaum.

Trope, Y., Gervey, B., & Bolger, N. (2003). The role of perceived control in overcoming defensive self-evaluation. *Journal of Experimental Social Psychology*, *39*, 407-419. doi:10.1016/S0022-1031(03)00035-0

Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review*, *117*, 440-463. doi:10.1037/a0018963

Trope, Y., & Neter, E. (1994). Reconciling competing motives in self-evaluation: The role of self-control in feedback seeking. *Journal of Personality and Social Psychology*, *66*, 646-657. doi:10.1037/0022-3514.66.4.646

Vallacher, R. R., & Wegner, D. M. (1989). Levels of personal agency: Individual variation in action identification. *Journal of Personality and Social Psychology*, *57*, 660-671. doi:10.1037/0022-3514.57.4.660

Wakslak, C. J., & Trope, Y. (2009). Cognitive consequences of affirming the self: The relationship between self-affirmation and object construal. *Journal of Experimental Social Psychology*, *45*, 927-932. doi:10.1016/j.jesp.2009.05.002

Weinstein, N. D. (1983). Reducing unrealistic optimism about illness susceptibility. *Health Psychology*, *2*, 11-20.