Using Mindsets to Boost Health: How Construal Level and Goal Pursuit Shape Health Message Effectiveness on Cessation Behaviors

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ABSTRACT

Purpose: The current research examines how construal level shapes the effectiveness of rational (vs. emotional) messages for inducing cessation behaviors. Concrete mindsets foster self-improvement goals, while abstract mindsets boost self-relevance goals.

Design/methodology/approach: In four studies, this research examines the moderating role of construal level on health messages and the underlying mechanism of goal pursuit.

Findings: Results demonstrate that concrete (vs. abstract) mindsets increase consumers' intent to engage in cessation behaviors when exposed to rational (vs. emotional) messages. Consistent with our theorizing, we found that self-improvement goals underlie the effects for concrete mindsets, while self-relevance goals mediate the effects for abstract mindsets.

Research limitations/implications: The reported effects are limited to health messages focusing on cessation behaviors.

Practical implications: This research can help public policymakers to design more effective health messages to foster specific cessation behaviors – quitting smoking and reducing drinking – focusing on concrete (vs. abstract) mindsets and rational (vs. emotional) messages.

Originality/value: Our investigation highlights construal level as an important moderator for message appeals (rational vs. emotional) on cessation behaviors, along with the underlying mechanism of goal pursuit, thus contributing to health marketing literature.

Keywords: cessation behaviors; construal level; emotional and rational messages; goal pursuit; health messages.

INTRODUCTION

Despite its well-known health risks, smoking and excessive drinking are still major current public health issues worldwide (Rakhi and Biswas, 2021; Simpson *et al*., 2019; Strebel and Terry, 2021). Indeed, smoking and excessive drinking account for several public policy consequences (e.g., passive smoking, road accidents, domestic violence) along with elevated public healthcare costs estimated at US$ 1.4 trillion per year for the global economy (WHO, 2021a). Although public health institutions strive to stimulate cessation behaviors, the prevalence of tobacco and alcohol consumption is still high, leading to more than 11 million premature deaths altogether (WHO, 2021b, 2021c) and killing more people than the COVID-19 pandemic (World Bank, 2021). Thus, restraining such behaviors is crucial, calling for the "need for tailored public health messaging and substance use support" (NYU News, 2021).

Remarkably, the challenges for policymakers are considerable and previous research has examined the effectiveness of health messages mainly focusing on rational and emotional appeals (e.g., Han *et al*., 2016; Herter *et al*., 2021; Kees *et al*., 2010; Keller and Lehmann, 2008; Teng *et al*., 2019). However, despite considerable academic research on the effectiveness of health messages (e.g., Bartikowski *et al.,* 2019; Brennan and Binney, 2010; Herter *et al*., 2021; Murdock and Rajagopal, 2017; Keller and Lehmann, 2008), prior research offers little insight regarding the interplay of health messages and consumer mindsets (abstract vs. concrete) in boosting cessation behaviors (Herter *et al*., 2021). While some previous studies suggest that emotional messages are more effective under abstract construal (e.g., Critcher and Ferguson, 2011; Han *et al*., 2016; Williams *et al*., 2014), others claim that emotional appeals match concrete construal (Chang and Pham, 2013; Septianto and Pratiwi, 2016).

To make sense of these mixed findings, this paper aims to examine the most effective ways to encourage cessation behaviors by analyzing the interplay between consumer

mindsets and health messages and the underlying mechanism of consumers goal pursuit. We draw upon past work on the construal level theory (CLT) and goal-pursuit literature to examine the moderating role of construal level on the effectiveness of health messages to promote cessation behaviors. In particular, we propose that a concrete mindset will enhance the persuasive power of rational messages via self-improvement goals, whereas an abstract mindset will make consumers more responsive to emotional appeals via self-relevance goals.

By doing so, our research provides important theoretical and managerial contributions to the literature on cessation behaviors and health messages. First, we compare both emotional and rational appeals since prior construal level research largely ignored the rational aspects of messages (Achar *et al*., 2020; Critcher and Ferguson, 2011; Emmons, 1992; Freitas *et al*., 2009; Herter *et al*., 2021; Pyone and Isen, 2011; Schwartz *et al.,* 2018; Williams *et al.,* 2014). That is, consistent with our theorizing, we show that concrete mindsets increase consumers' intent to engage in cessation behaviors when exposed to rational messages, while abstract mindsets boost the effectiveness of emotional messages. Second, we reunite prior conflicting findings regarding emotional and rational message framing and construal level. Specifically, some research suggests that emotional messages are more effective with abstract mindsets (e.g., Critcher and Ferguson, 2011; Han *et al*., 2016; Williams *et al*., 2014), while others indicated that concrete mindsets are (Septianto and Pratiwi, 2016). In addition, inconsistencies were also identified considering rational messages; while some authors show that rational messages are more effective with a concrete mindset (Han *et al*., 2016), others found no significant differences (Carrera *et al.,* 2014; Chang and Pham, 2013). Therefore, we contribute by showing the effects of construal level on rational and emotional health messages. Third, our research proposes goal pursuit as a novel mechanism in CLT applied to public health marketing communications. That is, we reveal that a concrete mindset fosters goal-progress, whereas an abstract mindset boosts goal-commitment, contributing to recent

research on the fit between goal progress and construal mindsets (Park and Hedgcock, 2016). Finally, we offer important recommendations for public policymakers to design more effective health messages to foster cessation behaviors.

HEALTH MESSAGES: A CONSTRUAL LEVEL PERSPECTIVE

Marketing communication strategies typically adopt two types of persuasive appeals: emotional and rational (e.g., Albers-Miller and Stafford, 1999; Andrade and Cohen, 2007; Cutler and Javalgi, 1993; Turley and Kelley, 1997). Although referring to the same notion (emotional vs. rational), prior research has used slightly different labels such as emotional and informational (Aaker and Norris, 1982), emotional and thinking (Golden and Johnson, 1983), mood and rational (Coulson, 1989), feeling and thinking (Vaughan, 1980), and transformational and informational (Dubé and Chattopadhyay, 1996; Zinkhan *et al.*, 1992). Herein, *emotional messages* are defined as messages that use affective content, whereas *rational messages* are those that focus on factuality, logic, and rationality (Albers-Miller and Stafford, 1999).

Emotional messages aim at producing affective reactions and feelings through subjective and evaluative properties of the content (Clow *et al*., 2002; Main *et al*., 2004; Stafford and Day, 1995). In contrast, rational messages are designed to spotlight objectivity following logical arguments and factual information (Stafford and Day, 1995), thus persuading consumers through strong arguments and sound reasoning (Albers-Miller and Stafford, 1999; Clow *et al*., 2002).

In this paper, we propose that construal level shapes the effectiveness of rational (vs. emotional) messages. The Construal Level Theory (CLT) is based on the notion that people have direct experience only of the concrete aspects of their environment (the here and now)

and that they abstract from this experience via mental representations (construal mindsets) to represent stimuli that cannot be directly accessed (Fujita *et al*., 2006; Trope and Liberman, 2010). One of the most fundamental aspects of such mental representations is whether they are construed abstractly or concretely (e.g., Trope and Liberman, 2003; Vallacher and Wegner, 1987). Whereas abstract mindsets reflect general, gist-based representations that contain the essential features of the objects and events (i.e., "why things are"), concrete mindsets consist of detail-oriented, literal descriptions (i.e., "how things come to be"). Indeed, *abstract* mindsets are often prompted by asking the "reasons why", which focus individuals on broad and general aspects of a target (Alter *et al*., 2010), capturing its global, superordinate, and primary characteristics (Fujita *et al.*, 2006). Conversely *concrete* mindsets are prompted by asking "how to" focusing individuals' attention to the target's specific features, capturing local, subordinate, and secondary characteristics (Fujita *et al.*, 2006). For instance, "stop drinking" might highlight *why* it is important to reduce alcohol consumption, whereas concrete mindsets might emphasize *how* to stop drinking by switching to non-alcoholic beverages like soda or juice (Trope and Liberman, 2003).

Extant research has examined how construal level influences consumers' information processing of various message types (see Table 1 for details). Some of this research (e.g., Septianto and Pratiwi, 2016) proposes that consumers with low-level concrete construal can feel emotions more intensely than those with high-level abstract construal. Accordingly, they show that consumers in a concrete mindset (but not in abstract mindset) evaluate a coffee ad with emotional appeal more favorably than one with cognitive appeal. Crucially, in this research, consumers responses seem to depend on the felt closeness to relatively simple emotionally evocative stimulus (e.g., refreshing coffee), which is absent under abstract mindsets.

Insert table 1 around here

However, the emotional valence of a stimulus has been shown to be fundamental to give meaning and make sense of its relevance, which suggests that affective information is a key element of abstract, gist-based representations. In this vein, Critcher and Ferguson (2011) found that an abstract mindset makes consumers more sensitive to affective information. Research further indicates that abstract mindsets are associated with emotional awareness (e.g., Emmons, 1992; Pennebaker, 1989). In addition, consumers primed with an abstract (vs. concrete) mindset tend to be more influenced by emotional over rational persuasive messages (Chan and Cho, 2012; Hernandez *et al*., 2015).

Drawing on the CLT literature, the current research proposes that construal level moderates the effectiveness of health messages promoting cessation behaviors (H_1). Specifically, consumers primed with a concrete mindset are expected to rely more on factual information and to be more prone to process rational (vs. emotional) messages. As a result, a concrete mindset will enhance the persuasive power of rational messages to promote cessation behaviors (H_{1a}). In contrast, priming an abstract mindset will make consumers more responsive to affective-laden information, and thus be more persuaded by emotional appeals. Therefore, we expect that an abstract mindset will increase the effectiveness of emotional messages to promote cessation behaviors (H_{1b}). More formally, we hypothesize that:

H_1. Construal level moderates the influence of rational and emotional message appeals on consumers' cessation behaviors.

H_{1a}. Rational (vs. emotional) messages will increase consumers' cessation behaviors when primed with a concrete mindset.

H_{1b}. Emotional (vs. rational) messages will increase consumers' cessation behaviors

when primed with an abstract mindset.

HEALTH MESSAGES AND GOAL PURSUIT

Goals are typically described as cognitive structures that can be represented in terms of progress toward a desirable end state or in terms of commitment to an end state. Goal pursuit mechanisms thus depend on whether goal-relevant actions are interpreted as promoting goal progress or promoting goal commitment (Dhar and Kim, 2007; Fishbach and Dhar, 2005).

Consumer behavior is usually goal-driven. In the presence of multiple goals, engaging in one goal in detriment of other depends on whether an action (in our case, cessation intention) is interpreted in terms of goal commitment or goal progress (Fishbach and Dhar, 2005). Specifically, goal progress is characterized as "the pursuit of a previously defined goal", whereas goal commitment refers to "an inference concerning the strength of a goal" (Fishbach and Dhar, 2005, p. 370). While goal commitment usually elicits consistent efforts to achieve self-relevant goals (e.g., stop smoking), goal progress focuses on one's evolution toward a goal and the concrete steps to attain it (e.g., I will start with 5 cigarettes a day, and then quit smoking altogether). Accordingly, previous research indicates that goals can reflect long-term, abstract objectives as well as concrete short-term targets (e.g., Trope and Fishbach, 2000).

This research combines the construal level and goal pursuit literatures to postulate that construal level shapes consumers' goal pursuit mechanisms underlying cessation behaviors. Dhar and Kim (2007) proposed that construal level may determine the interpretation of an action. When consumers interpret their goal-related actions in terms of low-level construal they tend to perceive such actions as goal progress to self-improvement. In contrast, when consumers interpret their actions in terms of high-level construal, such actions are perceived

as self-relevant examples of goal-commitment.

Therefore, we predict that consumers primed with an abstract mindset and exposed to an emotional (vs. rational) appeal to cease unhealthy behaviors will perceive their actions as reflecting goal-commitment (i.e., to attain the desired state of being healthier). In other words, when cessation behaviors are construed at an abstract level, consumers will more readily commit to self-relevant goals thereby increasing the likelihood of maintaining goal pursuit. Indeed, self-relevant goals are linked to an abstract way of thinking (abstract mindsets – e.g., Ledgerwood *et al*., 2010; Torelli and Kaikati, 2009). It follows that an abstract mindset is the key for persuading consumers to pursue their self-relevant goals such as halting unhealthy behaviors (e.g., Fishbach and Dhar, 2005; Ülkümen and Cheema, 2011). We thus suggest that self-relevance mediates the effectiveness of health messages on cessation behaviors for consumers with an abstract mindset (H_{2a}).

In contrast, consumers primed with a concrete mindset and exposed to rational (vs. emotional) appeals will perceive their behaviors as a way of self-improvement signaling progress towards the goal of becoming healthier. Cessation behaviors construed at a concrete level will be inferred as goal progress and thereby heighten one's tendency to follow self-improvement goals. Self-improvement goals refer to "the desire for feedback with improvement potential" (Sedikides and Hepper, 2009, p. 900) and they may include cues that convey progress toward a focal goal. Thus, since a concrete mindset highlights the specific benefits of cessation behavior signaling goal progress, we predict that self-improvement mediates the effectiveness of health appeals on cessation behaviors (H_{2b}). More formally, we hypothesize that:

H_{2a}. Self-relevance goals will mediate the message framing effect on cessation behaviors among consumers with an abstract mindset.

H_{2b}. Self-improvement goals will mediate the message framing effect on cessation

behaviors among consumers with a concrete mindset.

OVERVIEW OF STUDIES

Four experimental studies test our proposed theoretical framework. Studies 1A and 1B examine the moderating role of construal level on the effectiveness of rational (vs. emotional) appeals on cessation behaviors. Specifically, Study 1A (antismoking messages) and Study 1B (antidrinking warnings) explore the role of a concrete (vs. abstract) mindset in increasing the effectiveness of a rational (vs. emotional) message. Study 2 explores the mediating role of goal pursuit. Self-relevance (goal-commitment) is proposed as the mediator for consumers in an abstract mindset, while self-improvement (goal-progress) underlies the effect for a consumer in a concrete mindset. Study 3 (antismoking warnings) extends our findings by using real anti-smoking warning messages.

STUDY 1A: ANTI-SMOKING MESSAGES

The objective of Study 1A was to test our prediction that construal level moderates the effect of appeal type on consumers' intention to engage in cessation behaviors (H_1). We used smoking as a health-related behavior. We predict that a concrete mindset boosts the influence of a rational (vs. emotional) appeal on cessation behaviors (H_{1a}), whereas an abstract mindset increases the effectiveness of an emotional (vs. rational) appeal (H_{1b}).

Participants and design

One-hundred sixteen French adult smokers (61.2% women; M_{age} = 25.3, SD = 7.4) volunteered to take part in the study. Study 1A used a 2 (construal level: abstract vs. concrete) x 2 (message framing: emotional vs. rational) between-subjects experimental design.

Procedure and stimuli

Participants were randomly exposed to one of the four experimental conditions. Construal level was manipulated by requesting participants to state in an open-ended response box "why" (abstract construal) or "how" (concrete construal) they should stop smoking to perform an activity (see Fujita *et al*. 2006). Specifically, participants wrote down statements "why" they should stop smoking (e.g., "because it is important to recover my health") or "how" they could stop smoking (e.g., "by using nicotine patches").

Next, participants were exposed to one of the two health messages (one emotional and one rational) that used a smoker's testimonial. Testimonials are a commonly used by health organizations to help people with cessation behaviors (CDC, 2021). Therefore, in the emotional appeal condition participants read a message that conveyed the smoker's emotions associated with being sick due to 20 years of smoking (e.g., shame and regret) as well as the emotional benefits related to quitting smoking (Albers-Miller and Stafford, 1999; Main *et al*., 2004; Moriarty, 1991). Participants in the rational appeal condition read a message describing information-based, factual advantages of quitting (Albers-Miller and Stafford, 1999; Cutler and Javalgi, 1993; Liebermann and Flint-Goor, 1996; Moriarty, 1991). The length of the messages was approximately the same. The details of the stimuli are provided in the Appendix.

Measures

Participants first reported their intention to stop smoking on a single likelihood scale ("I intend to stop smoking") ranging from 0 (not at all likely) to 100 (extremely likely).

To check for the construal level manipulation, two independent judges analyzed the

written content and classified their responses as prominently abstract (1), concrete (-1), or neither abstract nor concrete (0) (Liberman and Trope, 1998). Disagreement between the two judges in the classification of five responses were resolved by a third independent judge.

The message manipulation checks comprised two items. Specifically, participants evaluated two items using a 7-point Likert scale (1-Strongly disagree to 7-Strongly agree): "The message displayed was emotional" and "The message displayed was rational" (Liu and Stout, 1987).

Message credibility, a control variable, was also checked via a three-item, 7-point Likert scale: "The message presented is credible", "The message presented is believable", and "The message presented is reliable" ($\alpha = .835$; Kukar-Kinney and Walters, 2003).

Findings

Manipulation checks and controls. Results from a one-way ANOVA comparing participants construal level (as assessed by independent judges) show a significant main effect ($F_{(1, 114)} = 653.30$, $p < .001$), such that an abstract mindset induced more abstract representations about stop smoking ($M = .94$, SD = .25; 95% CI 0.88 to 1.00), while a concrete mindset induced more concrete representations ($M = -.74$, SD = .45; 95% CI -0.86 to -0.62).

A one-way ANOVA on the message manipulation also showed a significant main effect on participants' emotional ($F_{(1, 114)} = 17.49$, $p < .001$) and rational perceptions ($F_{(1, 114)} = 5.05$, $p < .05$). As expected, participants assessed emotional messages as "more emotional" ($M = 4.97$, SD = 1.78; 95% CI 4.51 to 5.43) than rational ones ($M = 3.56$, SD = 1.83; 95% CI 3.09 to 4.03); and evaluated rational messages as "more rational" ($M = 4.78$, SD = 1.24; 95% CI 4.46 to 5.10) than the emotional ones ($M = 4.13$, SD = 1.79; 95% CI 3.67 to 4.59).

Lastly, a one-way ANOVA showed no difference in perceived credibility between the two messages ($F_{(1, 114)} = 1.98$, *ns*; $M_{emotional} = 6.03$, SD = 1.16, 95% CI 5.73 to 6.33; $M_{rational} = 5.74$, SD = 1.08, 95% CI 5.46 to 6.02), ruling out the possibility that changes in credibility accounted for the effects.

Stop smoking intention. A 2x2 ANOVA with construal level (abstract vs. concrete) and message (emotional vs. rational) on stop smoking intention revealed the predicted interaction (see Fig. 1) ($F_{(1, 112)} = 9.09$, $p < .01$), providing support to H_1. Simple comparisons show that a concrete mindset led to higher levels stop smoking intentions with rational ($M = 47.71$, SD = 5.41; 95% CI 45.70 to 49.70) rather than emotional messages ($M = 31.36$, SD = 5.72, 95% CI 29.30 to 33.40; $F_{(1, 112)} = 4.31$, $p < .05$), supporting H_{1a}. In contrast, an abstract mindset led to higher levels of quitting intention with emotional ($M = 50.25$, SD = 4.77; 95% CI 48.50 to 52.00) rather than with rational messages ($M = 34.26$, SD = 5.51, 95% CI 32.30 to 36.30; $F_{(1, 112)} = 4.82$, $p < .05$), confirming H_{1b}. No main effects of construal level ($F_{(1, 112)} = .26$, *ns*) and message type ($F_{(1, 112)} = .01$, *ns*) were observed.

Insert Figure 1 about here.

Gender, age, and the number of cigarettes smoked per day were tested as potential covariates on the interaction between construal level and message type on quitting intention. No significant effects were found for gender ($F_{(1, 111)} = .07$, *ns*), age ($F_{(1, 111)} = 2.01$, *ns*), or number of cigarettes smoked per day ($F_{(1, 111)} = 0.42$, *ns*).

Discussion

Study 1A findings suggest that the effectiveness of health appeals depends on

construal level: while smokers in a concrete mindset exhibited higher levels of quitting intention when exposed to a rational message, those in an abstract mindset were more influenced to cease smoking exposed to an emotional message. Our results shed some light on previous research regarding the effectiveness of health messages (e.g., Adams *et al*., 2011; Keller and Lehmann, 2008) by revealing the moderating role of construal level. Moreover, our findings extend prior research on construal level by contrasting rational and emotional health messages (Herter *et al*., 2021; Murdock and Rajagopal, 2017).

STUDY 1B: ANTI-DRINKING WARNINGS

Study 1B provides an additional test of construal level and health message effects on consumers' cessation behaviors. Study 1B extends the previous study in three ways. First, the health context is different (alcohol consumption). Second, rational (vs. emotional) messages were manipulated as a warning in an alcohol product advertising. Third, advancing Study 1A, the subject matter of the construal level manipulation (i.e., being a healthy person) is different from the target content of the warning message (dangers of excessive alcohol consumption).

Pre-test

Construal level and message manipulations in Study 1B were pretested with seventy-eight undergraduate students from a major European university (>18 years) (58% women; M_{age} = 20, SD = 0.95). Participants were randomly assigned to state in an open-ended box either "why" (abstract construal) or "how" (concrete construal) to be a healthy person (adapted from Fujita *et al.,* 2006). Two independent judges analyzed the content of the construal level descriptions and classified them as having an abstract (1), concrete (-1), or neither abstract nor concrete (0) mindset (Liberman and Trope, 1998). Judges disagreement

in the classification of 6 responses were resolved by a third independent judge. Results from a one-way ANOVA provide support for the main effect of construal level manipulation on the abstract and concrete content descriptions ($F_{(1,76)} = 919.86$, $p < .001$) – suggesting as expected, that in an abstract (vs. concrete) mindset, participants provided more abstract (M = .95, SD = .23; 95% CI 0.88 to 1.02) than concrete descriptions (M = -.90, SD = .30; 95% CI -0.994 to -0.806).

The message manipulation was also pretested. Participants were asked to read one of two versions of a vodka advertising, one with an emotional and another with a rational warning message. The emotional warning focused on emotional consequences related to drinking (e.g., embarrassment and shame), whereas the rational warning focused on diseases and health issues related to alcohol consumption (e.g., cirrhosis and chronic inflammation of organs). Next, participants were asked to evaluate the message on a five-item, 7-point, semantic differential (α = .816): "based on the reason/based on the emotions", "appeals to reasons/appeals to emotions", "is rational/is emotional", "generates logical thinking/generates feelings", and "is objective/is subjective" (Liu and Stout, 1987). Higher (vs. lower) scores indicate higher levels of emotional (vs. rational) message content.

Results from one-way ANOVA support the main effect of message manipulation ($F_{(1, 76)} = 54.48$, $p < .001$), indicating that the emotional message resulted in higher emotional content ratings (M = 5.49, SD = 1.03; 95% CI 5.17 to 5.81) than the rational message (M = 3.54, SD = 1.29; 95% CI 3.13 to 3.95).

Similar to Study 1A, we examined perceived credibility of the message (α = .841). Again, a one-way ANOVA showed no significant credibility differences between emotional (M = 5.22, SD = 1.44; 95% CI 4.77 to 5.67) and rational (M = 5.66, SD = 1.04; 95% CI 5.33 to 5.99) appeals ($F_{(1, 76)} = 2.39$, *ns*), ruling out the potential credibility confound.

Main Study: Participants and design

Study 1B followed a 2 (construal level: abstract vs. concrete) by 2 (message framing: emotional vs. rational) between-subjects experimental design. Two-hundred thirty-eight French university students (>18 years), that drank at least once a week, were recruited to participate in the study (56.3% women; M_{age} = 22.2, SD = 3.05).

Procedure and stimuli

Participants were first randomly assigned to complete the construal level manipulation ("why" and "how" task - adapted from Fujita *et al*., 2006), and then exposed to one of the two pretested versions of a vodka advertising. The message manipulation involved an anti-drinking warning (emotional vs. rational). The stimuli are fully available in the Appendix.

Measures

Participants reported their intention to reduce alcohol consumption on a 5-point Likert scale ("I want to reduce my alcohol consumption in the future"). Higher (vs. lower) scores indicate higher (vs. lower) cessation intentions. The construal level manipulation was checked as in the pre-test. The judges' disagreement in the classification of 11 responses was resolved by a third independent judge.

Findings

Manipulation checks. Results from a one-way ANOVA show a significant main effect of construal level manipulation on participants' content descriptions ($F_{(1, 236)}$ = 2137.13, p < .001). Specifically, an abstract mindset resulted in more abstract representations about why to be a healthy person (M = .88, SD = .37; 95% CI 0.81 to 0.95), whereas a concrete mindset led

to more concrete representations about how to be a healthy person (M = -.95, SD = .22; 95% CI -0.989 to -0.91).

Reduced alcohol consumption intention. Results from a 2x2 ANOVA revealed the predicted interaction between construal level and message on participants' reduced drinking intention ($F_{(1, 234)} = 8.09$, $p < .01$), providing additional support for H_1. Specifically, results show that for concrete mindsets, a rational message (M = 2.43, SD = 1.51; 95% CI 2.05 to 2.81) enhanced participants' intention to reduce alcohol consumption in comparison to an emotional message (M = 1.96, SD = 1.07, 95% CI 1.69 to 2.23; $F_{(1, 234)} = 3.87$, $p < .05$), further supporting H_{1a}. However, for consumers in an abstract mindset, an emotional message (M = 2.75, SD = 1.26; 95% CI 2.43 to 3.07) led to higher levels of reduced alcohol consumption than a rational message (M = 2.25, SD = 1.24, 95% CI 1.94 to 2.56; $F_{(1, 234)} = 4.23$, $p < .05$). No significant main effects were found for construal level ($F_{(1, 234)} = 3.20$, *ns*) or for the message ($F_{(1, 234)} = .01$, *ns*). Figure 2 illustrates the results of construal level and message interaction on reduced alcohol consumption intention.

Insert Figure 2 about here.

Once again, gender, age, and alcohol consumption frequency were tested as possible covariates. No significant effects were found for gender ($F_{(1, 234)} = 01$, *ns*) and age ($F_{(1, 234)} = .55$, *ns*). Despite the impact of alcohol consumption frequency on future consumption intention ($F_{(1, 234)} = 43.22$, $p < .001$), the interaction between construal level and message type remained significant after controlling for participants' alcohol consumption frequency ($F_{(1, 234)} = 4.61$, $p < .05$).

Discussion

Study 1B provides further support for the proposed moderation of construal level on health message effectiveness: a rational message was more effective in reducing alcohol consumption among participants primed with a concrete mindset, while an emotional message was more effective for those primed with an abstract mindset.

Taken together, Studies 1A and 1B add to the healthcare marketing literature by showing the joint effect of construal level and message type consumers' propensity to engage in cessation behaviors (e.g., Carrera *et al.*, 2014; Critcher and Ferguson, 2011; Han *et al.*, 2016). Moreover, our findings contribute to clarify previous research (e.g., Critcher and Ferguson, 2011; Chang and Pham, 2013, Study 1; Han *et al*., 2016; Septianto and Pratiwi, 2016; Williams *et al*., 2014) by showing that an emotional message is more effective in inducing cessation behaviors among consumers with an abstract mindset.

STUDY 2: GOAL PURSUIT DUAL MEDIATION

Study 2 aims to test our full model by examining the dual mediation process of self-improvement and self-relevance. More specifically, it explores self-relevance as a mediator in an abstract mindset (H_{2a}) and self-improvement as the underlying mechanism in a concrete mindset (H_{2b}). Study 2 includes two types of cessation behaviors: quit smoking and reduced drinking. Finally, it tests for alternative mediators (mood, implementation intention, message fluency, involvement, and efficacy, which have been studied in previous research (e.g., Han *et al*., 2016; White *et al*., 2011).

Participants and design

Three-hundred forty-four US participants (52.9% male; M_{age} = 38.1, SD = 11.8) were

recruited through Amazon Mechanical Turk to take part in the study and were paid (0.50 USD). All participants were aged over 18 years old, currently smokers, and consumed alcohol at least once a week. Study 2 used a 2 (construal level: abstract vs. concrete) by 2 (message type: emotional vs. rational) between-subjects experimental design.

Procedure and stimuli

Participants were first randomly assigned to complete the construal level manipulation as in Study 1B ("why" and "how" to be a healthy person – adapted from Fujita *et al*., 2006), and then exposed to either an emotional or a rational health appeal. The emotional message focused on negative emotional consequences (e.g., unhappiness and anxiety) related to an unhealthy lifestyle. The rational message described diseases and health issues associated with an unhealthy lifestyle (e.g., cardiovascular diseases and cancer). Both messages were similar in terms of layout and length. The construal level and message type manipulations are shown in Appendix.

Measures

Participants reported their cessation behavior intentions (quit smoking and reduce drinking) across four-items adapted from Seacat and Mickelson (2009). Specifically, participants used a scale from 0 to 100% to estimate their probability of quit smoking ("Reduce smoking" and "Try not smoking"; $r(344) = .69$, $p < .001$) and reduce drinking ("Reduce my alcohol intake" and "Try not to drink"; $r(344) = .72$, $p < .001$).

Self-relevance was accessed by two items ($r(344) = .73$, $p < .001$) on a 7-point Likert scale: "The message is personally relevant" and "The message is personally involving (adapted from Block, 2005). Self-improvement was measured by seven items (e.g., "I feel capable of making positive changes", "I would like to discover new strategies for improving

myself"; α = .831, Breines and Chen, 2012) using a 7-point Likert scale.

Additionally, we measured for theoretically-relevant potential alternative mediators: mood (four-items, α = .929; Bargh *et al*., 1996, Experiment 2c; Chartrand *et al.*, 2006), implementation intentions (three-items, α = .884; adapted from Ziegelmann *et al*., 2007), fluency (three-items, α = .885; Lee and Aaker, 2004; White *et al*., 2011), message involvement (three-items, α = .878; Lee and, Aaker, 2004; White *et al*., 2011), and perceived efficacy (three-items, α = .822; White *et al*., 2011).

The manipulation check for construal level was verified by coding the descriptions obtained from the "why" and "how" task (Fujita *et al*., 2006). In the 8 cases with a disagreement between the two judges, a third judge was used to decide the final classification. The manipulation check for message type consisted of the same semantic differential scale used in Study 1B (α = .959; Liu and Stout, 1987). Lastly, credibility of the message was measured using the same 3 items used in the previous studies (α = .878; Kukar-Kinney and Walters, 2003).

Findings

Manipulation checks and controls. Results from a one-way ANOVA provide support for the main effect of construal level manipulation on the abstract and concrete descriptions ($F_{(1, 342)} = 1649.99$, $p < .001$), showing that in abstract (vs. concrete) mindset, participants provided more abstract ($M = .79$, SD = .48; 95% CI 0.72 to 0.86) than concrete descriptions ($M = -.93$, SD = .29; 95% CI -0.97 to -0.89).

One-way ANOVA show the main effect of message manipulation ($F_{(1, 342)} = 5.91$, $p < .05$). As expected, participants in the emotional condition reported higher levels of emotional content ($M = 4.01$, SD = 1.78; 95% CI 3.74 to 4.28) than those in the rational condition ($M =$

3.52, SD = 1.98; 95% CI 3.22 to 3.82), suggesting that our message manipulation worked as expected.

Message credibility was analyzed as a control variable. Results from a one-way ANOVA suggest similar credibility levels ($F_{(1, 342)} = 2.02$, *ns*) for emotional ($M = 5.98$, SD = 1.03; 95% CI 5.83 to 6.13) and rational ($M = 6.12$, SD = .92; 95% CI 5.98 to 6.26) appeals, thus eliminating the potential confound of message credibility.

Cessation behaviors. 2x2 ANOVA show a significant interaction between construal level and message type on participants' quit smoking ($F_{(1, 340)} = 6.55$, $p < .05$) and reduced drinking intentions ($F_{(1, 340)} = 5.76$, $p < .05$), confirming H_1. Simple comparisons suggest that when primed with a concrete mindset, a rational (vs. emotional) message was more effective in inducing cessation behaviors: quitting smoking ($F_{(1, 340)} = 10.05$, $p < .01$; $M_{rational} = 80.85$, SD = 26.97, 95% CI 75.10 to 86.50; $M_{emotional} = 66.86$, SD = 33.01, 95% CI 59.90 to 73.80) and reduced drinking intentions ($F_{(1, 340)} = 7.22$, $p < .01$; $M_{rational} = 74.19$, SD = 27.38, 95% CI 68.40 to 80.00; $M_{emotional} = 62.84$, SD = 29.88, 95% CI 56.50 to 69.20), supporting H_{1a}.

However, when primed with an abstract mindset participants revealed similar levels of quit smoking ($F_{(1, 340)} = .24$, *ns*) and reduce drinking intentions ($F_{(1, 340)} = .54$, *ns*) for both emotional ($M_{quit\_smoking} = 75.11$, SD = 26.97, 95% CI 69.40 to 80.80; $M_{reduced\_drinking} = 68.55$, SD = 25.88, 95% CI 63.10 to 74.00) and rational message ($M_{quit\_smoking} = 72.88$, SD = 30.33, 95% CI 66.50 to 79.30; $M_{reduced\_drinking} = 65.35$, SD = 29.19, 95% CI 59.20 to 71.50). Results also show a marginally significant main effect of message type ($F_{(1, 340)} = 3.45$, $p = .064$) on quit smoking intentions and no significant main effect of construal level ($F_{(1, 340)} = .01$, *ns*). Moreover, no significant main effects were found for reduce drinking intentions (construal level: $F_{(1, 340)} = .27$, *ns*; message type: $F_{(1, 340)} = 1.81$, *ns*).

As in the previous studies, gender and age were tested as potential covariates on the interaction between construal level and message on cessation behaviors. No significant

effects were found for gender ($F_{(1, 339)} = 2.94$, *ns*) and age ($F_{(1, 339)} = .18$, *ns*) on quit smoking intentions. In addition, results indicate that when controlled by gender a significant effect was observed for reducing drinking intentions ($F_{(1, 339)} = 4.11$, $p < .05$) but not for age ($F_{(1, 339)} = .01$, *ns*). It is important to highlight that when controlling for gender, the interaction effect between construal level and message on reduced drinking intentions remained significant ($F_{(1, 339)} = 5.74$, $p < .05$). Thus, gender and age do not affect the interaction between construal level and message on both cessation behaviors and therefore should not be considered as covariates.

Mediation effects of self-relevance and self-improvement. We examined the mediation process of message type (independent variable) and construal level (moderator variable) interaction on cessation behaviors (quit smoking and reduced drinking - dependent variables) through self-relevance and self-improvement (mediators) using PROCESS Model 8 with 5,000 bootstrapped samples (Hayes, 2013). As expected, the bootstrap analysis indicates that the indirect effect of message type on cessation behaviors through self-relevance was significant for participants in an abstract mindset (quit smoking: $b = 2.35$; 95% CI: .17 to 5.13; reduced drinking: $b = 1.77$; 95% CI: .12 to 4.04), but not for those in a concrete mindsets (quit smoking: $b = -.81$; 95% CI: -3.38 to 1.36; reduced drinking: $b = -.61$; 95% CI: -2.63 to 1.02). The index of moderated mediation was significant for both cessation behaviors: quit smoking ($b = -3.15$; 95% CI: -7.20 to -.09) and reduced drinking ($b = -2.37$; 95% CI: -5.59 to -.10), providing additional support for H_{2a}. The positive effect in the abstract construal condition indicates that an emotional message is driving the effects. The direct effect of message type on cessation behaviors was not significant in the abstract mindset condition (quit smoking: $b = -.29$; 95% CI: -8.66 to 8.07; reduced drinking: $b = 1.21$; 95% CI: -6.74 to 9.16) indicating a full mediation of self-relevance. Moreover, in the concrete mindset condition the direct effect of message type was significant for quit smoking

intentions (b = -10.47; 95% CI: -18.63 to -2.31) but not for reduced drinking intentions (b = -7.37; 95% CI: -15.12 to .39).

Results also show that the indirect effect of message type on cessation behaviors through self-improvement was significant in the concrete mindset condition (quit smoking: b = -2.71; 95% CI: -5.39 to -.61; reduced drinking: b = -3.38; 95% CI: -6.37 to -.97), but not significant in the abstract mindset condition (quit smoking: b = .18; 95% CI: -1.97 to 2.34; reduced drinking: b = .22; 95% CI: -2.20 to 2.73). The index of moderated mediation was significant for both cessation behaviors: quit smoking (b = -2.89; 95% CI: -6.43 to -.11) and reduced drinking (b = -3.60; 95% CI: -7.58 to -.23), supporting H_{2b}. The negative effect in the concrete mindset condition indicates that the rational message is driving the effects. Moreover, in the concrete mindset condition the direct effect of message on quit smoking intentions was significant (b = -10.47; 95% CI: -18.63 to -2.31) whereas the effect on reduced drinking intentions was not significant (b = -7.37; 95% CI: -15.12 to .39). These results suggest a partial mediation of self-improvement for quit smoking and a full mediation for reduced drinking. The direct effect of message on cessation behaviors was not significant in the abstract mindset condition (quit smoking: b = -.29; 95% CI: -8.66 to 8.07; reduced drinking: b = 1.21; 95% CI: -6.74 to 9.16). Figure 3A illustrates the moderated mediation results for quit smoking intentions and Figure 3B for reduced drinking intentions.

Insert Figures 3A and 3B about here.

Alternative mediators. We also analyzed other potential mediators (i.e., mood, implementation intentions, fluency, involvement, and efficacy) for the proposed interaction between message type (independent variable) and construal level (moderator variable) on

cessation behaviors (quit smoking and reduced drinking - dependent variables) beyond the process of self-relevance and self-improvement (mediators) using PROCESS Model 8 with 5,000 bootstrapped samples (Hayes, 2013). The index of moderated mediation showed no significant effect of any other potential mediators for quit smoking (mood: b = -.90; 95% CI: -.61 to 3.41; implementation: b = -.41; 95% CI: -2.41 to 1.09; fluency: b = .78; 95% CI: -1.58 to 3.22; involvement: b = .01; 95% CI: -.96 to 1.10; efficacy: b = -.47; 95% CI: -3.40 to 2.00) and for reduced drinking intentions (mood: b = .33; 95% CI: -.66 to 1.91; implementation: b = -.78; 95% CI: -3.80 to 1.19; fluency: b =.18; 95% CI: -.90 to 1.56; involvement: b = .07; 95% CI: -1.26 to 1.80; efficacy: b = -.16; 95% CI: -2.31 to 1.09). These results suggest that mood, implementation intentions, fluency, involvement, and efficacy did not mediate the effect of message type and construal level interaction on either cessation behavior.

Discussion

Study 2 refines our theorizing by showing how construal level moderates the effectiveness of health message types on cessation behaviors. Specifically, goal pursuit emerges as an underlying mechanism in the context of public health marketing communications (Dhar and Kim, 2007) extending previous research on construal level and message effectiveness (e.g., Han *et al*., 2016; White *et al*., 2011). Our results show that self-relevance (goal-commitment) mediates the effect of message type on cessation behaviors when consumers are primed with an abstract mindset (Fishbach *et al*., 2006; Torelli and Kaikati, 2009). Moreover, Study 2 reveals that self-improvement (goal-progress) underlies the effect in the concrete mindset condition. Therefore, these findings contribute to the goal pursuit literature (e.g., Dhar and Kim, 2007) by suggesting that consumers in a concrete mindset interpret their goal-related actions as goal-progress (Fishbach and Dhar, 2008), fulfilling their healthy goals via self-improvement. However, this study presented similar

results regarding cessation behaviors in the abstract construal. Recent research in construal level shows that abstract construals can result into similar results for messages (Pinto *et al*., 2020). Thus, to improve the robustness of our findings, we have added the Study 3.

STUDY 3: PRACTICAL IMPLICATIONS OF REAL ANTI-SMOKING WARNINGS

Study 3 aims enhancing the generalizability of the results by exploring real warning messages recently proposed by the Food and Drug Administration (FDA, 2021), increasing the practical relevance of our findings. However, although this study provides a test of current practices from public policy (i.e., FDA), it introduces some possible confounds intrinsically related to the use of real-world ads that were not developed for this research purposes.

Pre-test

Three-hundred and twenty-eight UK adult smokers (55.2% women; M_{age} = 41.2, SD = 12.93) were recruited to evaluate one of the eleven anti-smoking warning messages proposed by FDA (2021): fetal growth, heart disease, neck cancer, lung disease, cataracts, erectile dysfunction, asthma, bladder cancer, peripheral vascular disease (PVD), CORP (lung disease), and diabetes. The messages were displayed in their original size. All participants were exposed for the first time to one of the 11 messages (between-subjects) to avoid multiple exposure to message information (e.g., Pechmann and Ratneshwar, 1994; Reinhard *et al*., 2014). Participants were asked to evaluate if they perceived the message as more emotional or rational, using the same 7-point semantic differential scale in Study 2 (5 items, α = .845; Liu and Stout, 1987).

Results reveal a main effect of anti-smoking warning message on participants' emotional vs. rational content ratings ($F_{(10, 317)}$ = 3.41, p < .001). Post hoc tests show that an

asthma warning message (M = 4.84, SD = 1.62; 95% CI 4.26 to 5.42) is perceived as more emotional than a bladder cancer (M = 3.52, SD = 1.33, 95% CI 3.04 to 4.00; $p < .05$), heart disease (M = 3.41, SD = 1.60, 95% CI 3.74 to 4.88; $p < .05$), cataracts (M = 3.21, SD = 1.46, 95% CI 2.69 to 3.73; $p < .01$), and diabetes warning message (M = 3.19, SD = 1.54, 95% CI 2.64 to 3.74; $p < .01$). No other differences reached statistical significance. Thus, the main study used two warning messages perceived as more emotional (asthma) and as more rational (cataracts). Figure 4 shows the mean scores of emotional vs. rational content ratings for each warning message.

Insert Figure 4 about here.

Main Study: Participants and design

Study 3 followed a 2 (construal level: abstract vs. concrete) by 2 (message: emotional vs. rational) between-subjects experimental design. Two-hundred and sixteen UK citizens who have never been exposed to the messages used (e.g., Pechmann and Ratneshwar, 1994; Reinhard *et al*., 2014) were recruited online to participate in the study. However, four of them were non-smokers and were thus removed from the final sample (62% women; M_{age} = 38.3, SD = 11.43). As in the pretest, the messages were displayed in their original size available at the FDA (2021) website.

Procedure and stimuli

Participants were first randomly assigned to complete the construal level manipulation ("why" and "how" to be a healthy person task - adapted from Fujita *et al*., 2006) and then

exposed to one of the two pretested warning messages: emotional (asthma) and rational (cataracts). The stimuli are provided in the Appendix.

Measures

Participants estimated their intention to quit smoking on a scale from 0 to 100% with two-items ("Reduce smoking" and "Try not smoking"; $r(216) = .69$, $p < .001$) adapted from Seacat and Mickelson (2009). Higher (vs. lower) scores indicate a higher (vs. lower) stop smoking intention.

As in the previous studies, construal level manipulation check was verified by two independent judges (Liberman and Trope, 1998). Message credibility was also assessed as in the previous studies (3 items, $\alpha = .903$; Kukar-Kinney and Walters, 2003).

Findings

Manipulation checks and controls. Results from a one-way ANOVA comparing participants construal level (as assessed by independent judges) show a significant main effect ($F_{(1, 214)} = 1574.60$, $p < .001$), such that an abstract mindset resulted in more abstract representations ($M = .93$, SD = .32; 95% CI 0.87 to 0.99) whereas concrete mindset promoted more concrete representations about being a healthy person ($M = -.88$, SD = .35, 95% CI -0.95 to -0.81).

The warning message type manipulation was effective ($F_{(1, 214)} = 57.81$, $p < .001$). Specifically, participants perceived the emotional warning message as "more emotional" ($M = 4.99$, SD = 1.35; 95% CI 4.74 to 5.25) and evaluated the rational one as "more rational" ($M = 3.59$, SD = 1.35; 95% CI 3.33 to 3.84). Furthermore, there was no significant differences for the warning messages credibility ($F_{(1, 214)} = 0.11$, *ns*; $M_{emotional} = 5.73$, SD = 1.28; $M_{rational} = 5.79$, SD = 1.00).

Stop smoking intentions. Results from a 2x2 ANOVA confirm the predicted interaction between construal level and warning message type on participants' quit smoking intentions ($F_{(1, 212)} = 9.29$, $p < .01$), providing additional support for H_1. In particular, results show that for concrete mindsets, the rational warning message ($M = 47.86$, SD = 29.05; 95% CI 40.10 to 55.60) had a more favorable impact on participants' intention to stop smoking than the emotional warning message (M =36.80, SD = 23.30, 95% CI 30.60 to 4.00; $F_{(1, 212)} = 4.21$, $p < .05$), further supporting H_{1a}. However, for abstract mindsets, the emotional warning message ($M = 52.87$, SD = 31.58; 95% CI 44.4 to 61.3) was more effective than the rational one ($M = 41.30$, SD = 24.05, 95% CI 34.9 to 47.7; $F_{(1, 212)} = 5.14$, $p < .05$). No significant main effects on quit smoking intentions were found for construal level ($F_{(1, 212)} = 1.64$, *ns*) or for message type ($F_{(1, 212)} = .01$, *ns*).

We also checked gender, age, and number of cigarettes smoked per day as possible covariates. No significant effects were found for gender ($F_{(1, 209)} = 2.23$, *ns*) and number of cigarettes smoked per day ($F_{(1, 209)} = 1.84$, *ns*) but for age ($F_{(1, 209)} = 6.13$, $p < .05$). Importantly, the interaction between construal level and warning messages remained significant after controlling for these covariates ($F_{(1, 209)} = 8.89$, $p < .01$).

Discussion

Study 3 extends our findings to real-world antismoking warning messages, thus enhancing the practical relevance of our findings. According to recent studies (University of Michigan, 2021), the graphic warning labels approved by the FDA displaying severe consequences of smoking may prevent hundreds of thousands of deaths. However, the true magnitude of their impact on smoking behavior is still uncertain (University of Michigan, 2021). The present study provides practical insights into how to improve the effectiveness of anti-smoking messages using construal level. Our results indicate that the effectiveness of

FDA's new antismoking warning messages might depend on the combination of consumer mindsets and message type.

GENERAL DISCUSSION

Across four studies, this research shows that construal level moderates the impact of health message type on cessation behaviors and that goal pursuit underlies this effect. More specifically, our findings demonstrate that a concrete (vs. abstract) mindset increases consumers' intent to engage in cessation behaviors when exposed to a rational (vs. emotional) message. In addition, goal pursuit emerged as a distinct psychological mechanism in driving cessation behaviors. A concrete mindset fosters goal-progress via self-improvement while an abstract mindset boosts goal-commitment via self-relevance. Our findings provide relevant theoretical and managerial implications, as well as new directions for future research.

Theoretical Contributions

Our investigation highlights construal level as an important driver of cessation behaviors along with the underlying mechanism of goal pursuit. First, we contribute to the healthcare marketing literature by comparing the effectiveness of emotional and rational appeals across abstract and concrete mindsets. While previous research on construal level mainly focused on emotions disregarding the rational aspects of messages (Achar *et al*., 2020; Critcher and Ferguson, 2011; Emmons, 1992; Freitas *et al*., 2009; Herter *et al*., 2021; Pyone and Isen, 2011; Schwartz *et al.,* 2018; Williams *et al.,* 2014), our research extends this literature by comparing two key dimensions of health messages: rational versus emotional. The findings support our initial prediction that construal level shapes the effectiveness of

rational (vs. emotional) messages on smoking and drinking cessation behaviors. Consumers in a concrete mindset rely on low-level construal representations, making them more sensitive to the specific factual information such as rational messages (Trope and Liberman, 2010). Conversely, consumers with an abstract mindset end up being more responsive to emotional messages as they rely on high-level construals that emphasize the essential aspects of the gist of the experiences (Liberman and Trope, 2008). These gist representations include affective evaluations as one of its critical components (Reyna, 2004; Rivers *et al*., 2008).

Second, our research reconciles prior conflicting findings regarding emotional and rational message framing. Whereas most experimental evidence (including ours) suggests that emotional messages are more effective with abstract mindsets (e.g., Critcher and Ferguson, 2011; Han *et al*., 2016; Williams *et al*., 2014), some studies propose the opposite indicating that emotional appeals are more effective with concrete mindsets (Septianto and Pratiwi, 2016). Our findings (S1A and S1B) suggest that a concrete mindset increase consumers' intent to engage in cessation behaviors when exposed to a rational message, and that an abstract mindset fosters cessation behaviors when exposed to an emotional message. We extend Septianto and Pratiwi 's (2016) work to the health context. Study 3 further extends our findings to FDA's (2021) antismoking warning messages.

In addition, although Han *et al*. (2016) indicate that rational messages are more effective with a concrete mindset, other studies found no significant differences (Carrera *et al.,* 2014; Chang and Pham, 2013). Our study contributes to this literature by showing the impact of construal level on both rational and emotional messages. That is, while a concrete mindset increases consumers' intent to engage in cessation behaviors when exposed to a rational appeal, an abstract mindset fosters cessation behaviors when exposed to emotional messages.

Third, our research also introduces goal pursuit as a novel mechanism in construal level theory applied to public health marketing communications. Previous research explored many different mechanisms to explain the joint effect of construal level and message type such as mood, implementation intentions, message fluency, involvement, and efficacy (e.g., Han *et al*., 2016; White *et al*., 2011). Our study adds to this literature by showing that a concrete mindset fosters goal-progress via self-improvement while an abstract mindset boosts goal-commitment via self-relevance.

Public Policy and Practical Implications

Overall, this research offers practical insights for public policymakers and practitioners. Public organizations that aim to increase health messages' effectiveness can use our findings to improve their efforts to foster specific cessation behaviors as smoking and alcohol consumption. Specifically, we show that consumers differ in their responses to health communications that feature rational (vs. emotional) information. Our studies explored different types of health communications: health messages (Studies 1A and 2) and health warnings (Studies 1B and 3). In addition, we tested both fictitious (Studies 1A, 1B, and 2) and real-world messages (Study 3; FDA, 2021). Therefore, our findings can be extended to diverse strategies (i.e., format, appeal) that public policymakers can use to curtail smoking and excessive alcohol consumption.

Our findings suggest that a concrete (vs. abstract) mindset boosts cessation behaviors when exposed to a rational (vs. emotional) appeal. Thus, public health marketing campaigns may successfully increase consumers' cessation behaviors by activating a concrete mindset while using rational messages (e.g., focusing on "how" to stop smoking and giving concrete information about smoking-related consequences). For instance, the current anti-smoking

warning messages proposed by FDA (2021) highlighting bladder cancer, heart disease, cataracts, and diabetes can be more effective in increase cessation behavior if presenting tips or guidance of how to stop smoking once they were considered as displaying a more concrete information. Also, campaigns incentivizing cessation behaviors – e.g., to reduce alcohol consumption – could create warnings that focus on "why" to stop drinking (abstract construal) and presenting emotional drinking-related consequences (emotional appeals). Regarding our test of real-world ads proposed by the FDA (2021), the asthma anti-smoking warning message was considered as the most emotional of all ads and could be more effective to foster cessation behaviors if constructed in an abstract mindset – i.e., displaying reasons "why" to stop smoking.

Finally, our research revealed an association between consumers' mindsets and health pursuit goals. Therefore, when aiming to boost short-term healthy behaviors (concrete construal), practitioners should focus on goal progress. One example is Smoke Free App (about 6 million downloads) that uses a gamified goal-progress approach to quit smoking showing one's overall progressing. Our findings indicate that such an approach might work only when consumers construe their health goals in a concrete mindset (focusing on "how" to become healthier) and via self-improvement. For those in an abstract mindset – i.e., focusing on "why" health is important in their lives – goal-commitment might be more relevant to attain such goals in the long-term. For instance, the A.A.'s 12-step program (Alcoholics Anonymous, 2021) focuses on goal-commitment, in a "group of principles, spiritual in their nature, which, if practiced as a way of life, can expel the obsession to drink and enable the sufferer to become happily and usefully whole". Thus, according to our findings, A.A.'s actions to reduce drinking via goal-commitment might be more effective using an abstract mindset.

Limitations and Future Research

This research has some limitations that may stimulate future research. The observed effects are limited to health messages focusing on two specific cessation behaviors: anti-smoking and anti-alcohol consumption. Future research could further explore factors that effectively promote behaviors such as healthy eating and exercising. For instance, further research might examine if other types of messages (e.g., specific emotions such as guilt and shame) could play a role to foster such behaviors.

Our studies always used a loss-framing associated with healthful cessation behaviors, in which the health context generally refers to consumers' sacrifice in the present to obtain gains in the future (e.g., Kees *et al*., 2010). However, past research discussed the influence of framing (i.e., positive vs. negative; gain vs. loss) on message persuasiveness. Some authors have reported that negative or loss-framed messages increase consumers' adoption of health measures (Keller and Lehmann, 2008; Rothman and Salovey, 1997; Wong and McMurray, 2002), whereas others have provided evidence indicating that a positive and gain-framing is more persuasive (e.g., Schneider *et al*., 2001). One potential interesting contribution to this debate would be to analyze how concrete versus abstract mindsets affect framing (Chandran and Menon, 2004; Eyal *et al*., 2004; Pyone and Isen, 2011; White *et al*., 2011). Thus, future research could further explore the relationship between low and high levels of construal level and message framing for emotional and rational health messages. Thus, future research could compare gain-framed versus loss-framed messages, to better understand the interactive effect in the abstract (vs. concrete) construal condition.

One important methodological limitation of this research is the manipulation of construal level since our studies used "why" and "how" tasks to activate the construal level (Fujita *et al*., 2006). Future research could activate construal level using psychological distance dimensions: temporal (now – after, e.g., Liberman *et al*., 2002), social (self – others,

e.g., Bar-Anan *et al*., 2006), spatial (here – there, e.g., Henderson *et al*., 2011), or hypothetical (certain – uncertain, e.g., Wakslak *et al*., 2006). It is possible that the construal level dimensions could affect one's healthful behaviors when thinking about becoming healthier for self (vs. others), now (vs. after), and here (vs. there), since, for example, research shows that social consequences are more effective in an abstract mindset (Orazi *et al.*, 2015). Moreover, further studies can also examine whether consumers' chronic construal level (Vallacher and Wegner, 1987) is associated with healthful initiatives by using the Behavioral Identification Form (BIF; Vallacher and Wegner, 1989). In addition, recent research (Okada, 2019) shows that healthful behaviors can be construed at different mindsets: exercising as a high-level abstract mindset, whereas dieting is a low-level concrete mindset. Future research could explore whether such behaviors construed at abstract (vs. concrete) mindsets could foster different goal pursuit mechanisms. This is an important limitation, since in our Study 2 do not show the significant differences in the moderated mediation across abstract construal conditions. Our findings show that the overall interaction is significant, as well as the index of moderated mediation, indicating significant differences between the underlying process across concrete (vs. abstract) conditions. Future studies could explore differences in the underlying processes of goal pursuit across construal level conditions.

Finally, Fishbach and Dhar (2005) and Fishbach *et al*. (2006) showed that consumers who interpret goal-related actions in terms of goal progress, rather than goal-commitment, are more likely to disengage from the original goal and move towards satisfying other goals. Consequently, the persuasive effect of a rational message (for consumers in a concrete mindset) may be destined to backfire, whereas the effect of an emotional messages (for consumers in an abstract mindset) may be more long-lasting. Future research is needed to test this possibility.

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FIGURES AND TABLES

FIGURE 1
RESULTS FROM STUDY 1A

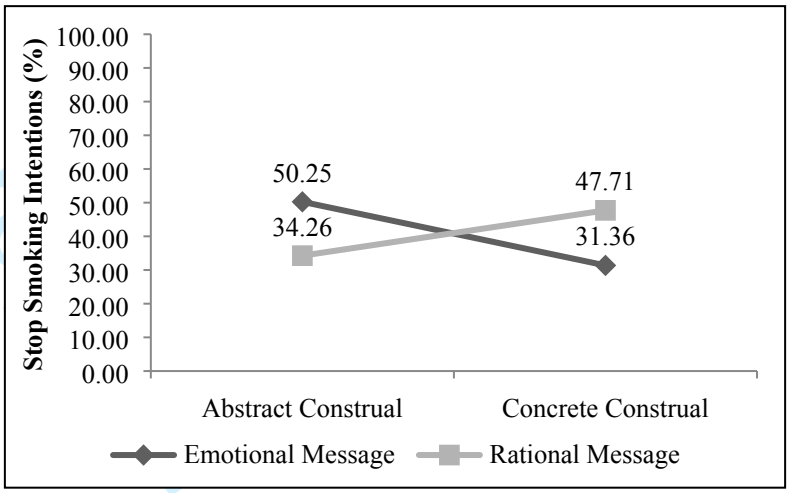


FIGURE 2
RESULTS FROM STUDY 1B

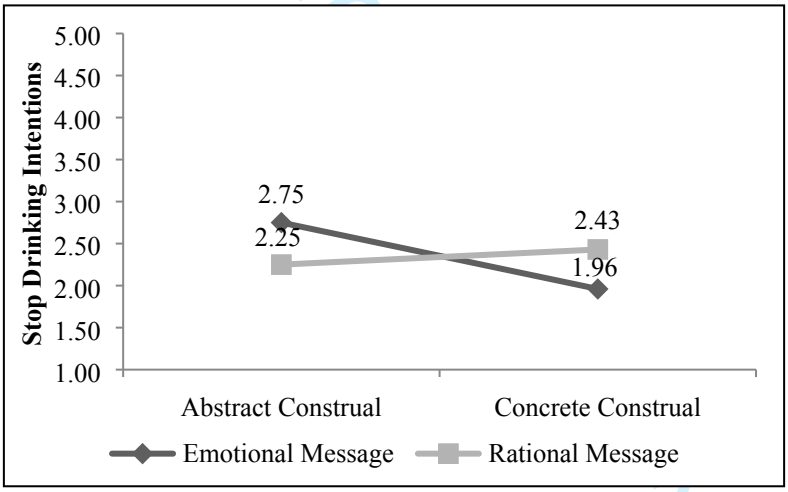
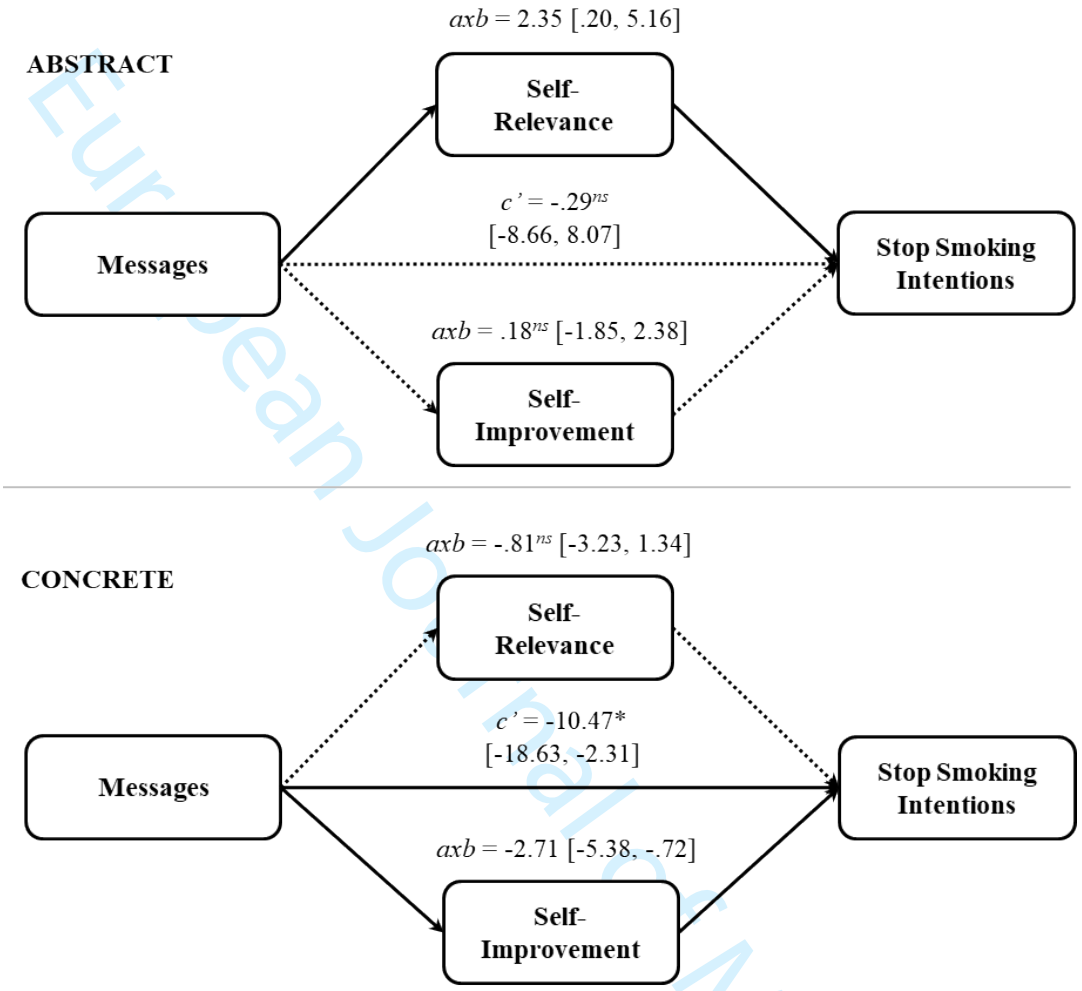


FIGURE 3A

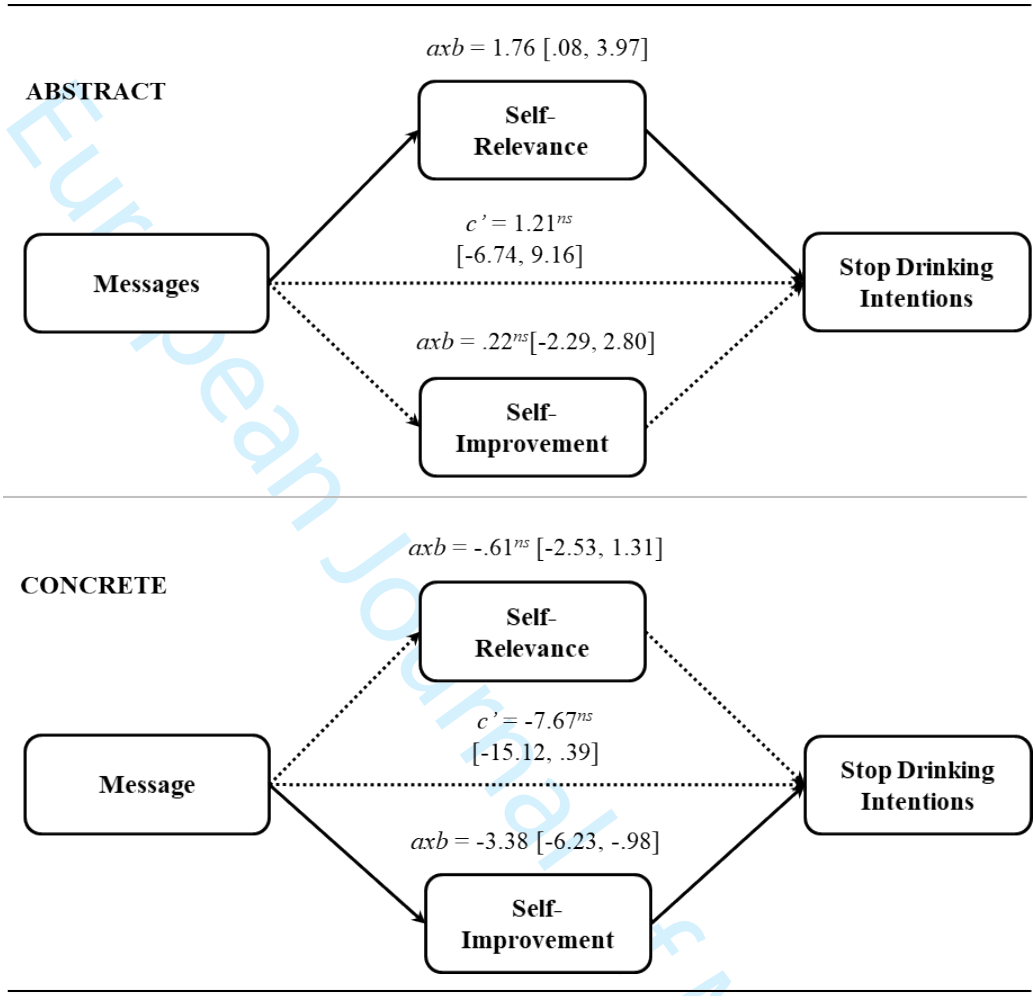
MEDIATION RESULTS FOR STOP SMOKING INTENTIONS FROM STUDY 2



NOTES. Dashed lines indicate paths that are not statistically significant. Bracketed numbers indicate 95% CIs. *$p < .05$, **$p < .01$, ***$p < .001$. ^{ns} = Not significant.

FIGURE 3B

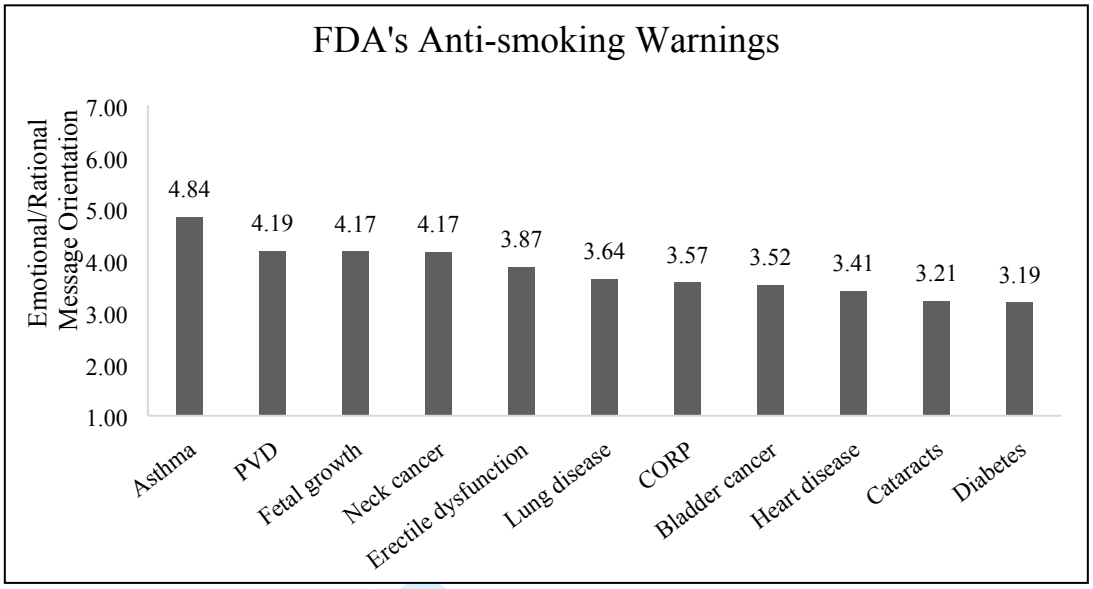
MEDIATION RESULTS FOR STOP DRINKING INTENTIONS FROM STUDY 2



NOTES. Dashed lines indicate paths that are not statistically significant. Bracketed numbers indicate 95% CIs. *$p < .05$, **$p < .01$, ***$p < .001$. ^{ns} = Not significant.

FIGURE 4

PRETESTED WARNING MESSAGES IN STUDY 3



Notes: Higher scores indicate an emotional message orientation, whereas lower scores indicate a rational message orientation. Source: Anti-smoking warnings (FDA, 2021).

TABLE 1
SUMMARY OF STUDIES ON CONSTRUAL LEVEL AND MESSAGE FRAMING

Study	Findings	Cessation Behavior?	Rational/ Emotional?	Health Message?	Goal Pursuit?	Dependent Variables
Achar *et al.*, 2020	Concrete (vs. abstract) mindset reduces fear and increases health persuasion.	No	Emotional	No	No	Behavioral intentions and fear
Carrera *et al.*, 2014	Abstract (vs. concrete) mindsets increase people affective attitudes to construe their behavioral intentions.	Drinking	Both	No	No	Behavioral intentions
Chang and Pham, 2013	Temporal proximity (i.e., concrete construal) amplifies the relative preference for options that are affectively superior and increases the effects of incidental affect on evaluations.	No	Emotional	No	No	Consumer preference and evaluations
Critcher and Ferguson, 2011	Abstract (vs. concrete) mindset increases sensitivity to affective information.	No	Emotional	No	No	Attitudes and mood
Emmons, 1992	Abstract mindset is associated with emotional awareness, whereas concrete mindset relates to nonaffective goals.	No	Emotional	No	Yes	Emotional awareness
Freitas *et al.*, 2009	Construing action abstractly was found to relate to experiencing positive affect.	No	Emotional	No	Yes	Goal-related variables
Han *et al.*, 2016	Abstract (vs. concrete) mindset enhance emotion-focus (vs. problem-focused) messages' persuasion.	No	Both	Yes	No	Persuasion
Herter *et al.*, 2021	Abstract (vs. concrete) construal fosters more healthful behaviors when consumers feel embarrassed (vs. sad).	Smoking	Emotional	Yes	No	Healthy behavioral intentions

Study	Findings	Cessation Behavior?	Rational/ Emotional?	Health Message?	Goal Pursuit?	Dependent Variables
Murdock and Rajagopal, 2017	Warning messages highlighting social (i.e., emotional) consequences leads to greater perceived temporal proximity (i.e., concrete construal) than those related to health (i.e., rational).	Smoking	No	Yes	No	Risk perceptions and consumer experiences
Pyone and Isen, 2011	Positive affect can promote abstract (vs. concrete) thinking.	No	Emotional	No	No	Intertemporal choice (consumers' willingness to wait for desired rewards)
Schwartz *et al*., 2018	Abstract (vs. concrete) mindset motivate people to experience emotions that are perceived as instrumental for achieving their goals in the long run.	No	Emotional	No	Yes	Goals, perceived usefulness of emotions
Septianto and Pratiwi, 2016	Concrete mindset increases emotional (vs. cognitive) appeal favorability.	No	Both	No	No	Ad evaluation
Williams *et al*., 2014	Abstract (vs. concrete) mindset enhance affect-based evaluation.	No	Emotional	No	No	Evaluation and behavior

APPENDIX

STIMULI USED IN STUDIES

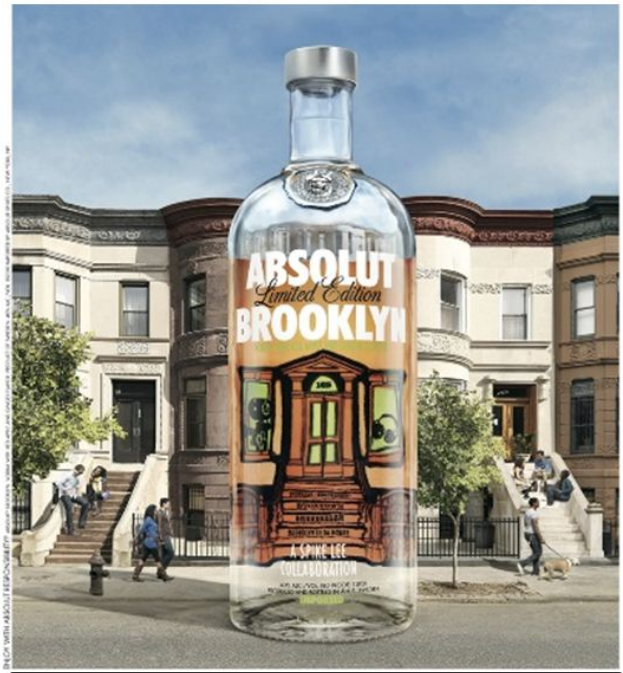
Condition	Instructions: Please carefully read the following instructions.
Study 1A – Abstract [Concrete] Construal	Why [How to] stop smoking? In particular, we would like to know why you think you should stop smoking [how you think you can stop smoking]. For example, what are the reasons and purpose [steps and methods] to stop smoking? Thank you for taking some time to explain in the space below why [how to] stop smoking. 1._____ 2._____ 3._____
Study 1B, 2, and 3 – Abstract [Concrete] Construal	Why [How] to be a healthy person? In particular, we would like to know why you think you should be a healthy person [how you think you can be a healthy person]. For example, what are the reasons and purpose [steps and methods] to be a healthy person? Thank you for taking some time to explain in the space below why [how] to be a healthy person. 1._____ 2._____ 3._____
Study 1A – Emotional [Rational] Message	Pierre, 49 years old, 20 years of smoking. He never tried to quit smoking because he believed that nothing would happen to him. At the age of 42, Pierre was diagnosed with lung cancer. He started chemotherapy, and despite the heavy and powerful treatment, cancer spread, and metastases formed in his body. He feels ashamed that he is unable to stop smoking and ask for help [He thinks he should have stopped smoking and asked for help]. He regrets his 20 years of smoking and feels that if he stopped smoking he could have more energy to live a happier life doing the things he loves, recovering a healthier life, and making his family and friends proud [He knows that even after 20 years of smoking, if he stopped smoking he could have more energy to breathe more easily after just 1 month, reduce the likelihood of dying from lung cancer by more than half, and set an example for his family and friends].

Study 1B – Emotional Message

Drinking makes people embarrassed once alcohol consumption tends to reduce self-control. The more people drink, the more they feel ashamed.

Alcohol abuse is dangerous for health.

Study 1B – Rational Message



Drinking increases health issues once alcohol consumption tends to generate cirrhosis. The more people drink, the more they have chronic inflammations of their organs.

Alcohol abuse is dangerous for health.

Study 2 – Emotional Message	An unhealthy lifestyle contributes to reduce ***emotional well-being*** and ***life satisfaction***. The more consumers are unhealthy, the more they ***feel unhappy*** and ***anxious***. **An unhealthy lifestyle is bad for health in several ways:** • An unhealthy lifestyle can decrease mood by increasing body fatigue and depression. • Opting for an unbalanced routine is an important step towards an unhappy and unhealthy lifestyle. • The disadvantages of an unhealthy lifestyle include lower emotional well-being since an unbalanced routine might increase mood swings and anxiety, impacting relaxation and life satisfaction.
Study 2 – Rational Message	An unhealthy lifestyle contributes to reduce ***health protection*** and ***immunity***. The more consumers are unhealthy, the more they have a ***risk of diseases*** and ***premature death***. **An unhealthy lifestyle is bad for health in several ways:** • An unhealthy lifestyle can decrease immunity by reducing body protection against certain types of diseases up to 80% such as cardiovascular diseases and cancer. • Opting for an unbalanced routine is an important step towards an inadequate body weight (BMI > 25) and unhealthy lifestyle. • The disadvantages of an unhealthy lifestyle include lower health protection an unbalanced routine might increase in 49% obesity and diabetes mortality, impacting blood pressure and cholesterol.