

Temporal Framing in Health Advertising: The Role of Risk and Future Orientation

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Abstract

This research examines the effects of the temporal frame advertisements and individual differences in future orientation on consumer risk perceptions, persuasion, and behavioral intentions. Results from two experiments indicate that temporal framing effects are moderated by consumers' tendency to think about the distant-future consequences of their behaviors. In Study 1, results show that future orientation moderates temporal framing effects on consumers' perceived risk. Study 2 demonstrates that consumer risk perceptions can mediate this interaction effect for intentions to engage in preventive behaviors. Implications are offered for advertising theory, as well as for creators of public service advertising campaigns.

The Centers for Disease Control and Prevention (CDC) has reported that nearly two-thirds of American adults are overweight (CDC 2007). Recent research, carefully controlling for the effects of age and other confounding factors, has estimated that obesity is responsible for nearly 112,000 deaths per year (Flegal et al. 2005). Given the severity of the national obesity epidemic, the United States Department of Agriculture (USDA) has committed a considerable amount of resources to providing nutrition education information in an easy-to-use, consumer-friendly form through federal and state communication campaigns (USDA 2005). Specifically, the USDA provides approximately 500 million dollars per year in nutrition education to help consumers become aware of preventive behaviors through educational campaigns and an additional \$500 million each year at the State level to support nutrition education interventions and activities aimed at promoting healthy eating and related lifestyle behaviors (USDA 2005; Food and Nutrition Services 2008).

Despite the efforts from both federal and state agencies, the problem seems to be worsening rather than improving. It is estimated that more than \$100 billion in direct and indirect health care expenses annually are a direct result from obesity and being overweight (CDC 2007). Consequently, one of the national health objectives established by the CDC is to reduce the prevalence of obesity to less than 15% by the year 2010 (CDC 2007). To help reach this goal, a number of government websites now exist to encourage Americans to make better lifestyle choices (e.g., nutrition.gov, smallsteps.gov, healthierus.gov, mypyramid.gov, 5aday.gov, healthierfeds.gov, etc.). Other government initiatives, such as the “Eat Smart, Play Hard” media campaign, exist to encourage children and adults to eat healthy and to be physically active each day.

Considering the huge health care costs the federal government incurs as a result of the growing obesity epidemic and the USDA monetary expenditures for nutrition education media campaigns, it is important to understand what types of health communication appeals are most effective at helping consumers make lifestyle choices. The purpose of this research is to investigate the impact of health communication appeals on risk perceptions, persuasion, and behavioral intentions in a print advertising context. Such research is important to examine within the realm of advertising and may help inform creators of public service campaigns commissioned by the USDA on how to inform and persuade Americans to make better health and lifestyle decisions.

In the following section, we discuss health and weight message appeals in advertising. We then review the literature on temporal framing and temporal orientation and outline the justification for our predictions. Methodology and results from two studies in which we examine temporal framing and individual differences in future orientation in the context of health advertising are discussed. Finally, we offer implications for advertising and public policy.

Background, Conceptualization, and Hypotheses

Risk Appeals in Public Service Advertising

Helping consumers to recognize health risks associated with the foods they consume and, in turn, make better food choices is complex. There are a number of different approaches used to communicate health information to consumers including food labels, promotional activities, and educational programs. One popular way to inform and persuade consumers to pay closer attention to the potential adverse effects of their food choices is through advertising and other media campaigns. As noted above, a large amount of federal funds are allocated to the design and implementation of media campaigns that are intended to inform and persuade consumers to

make smart food choices. Important considerations in the design of these campaigns include what type of message appeals to use and how to frame particular messages to maximize effectiveness. There is extensive research on various framing effects in health advertising (e.g., Block and Keller 1995; Maheswaran and Meyers-Levy 1990; Meyerowitz and Chaiken 1987; Rothman and Salovey 1997). Much of the health advertising research focuses on risk communication, how to inform consumers about health risks (e.g., HIV, cancer, etc.) and then persuade them to take actions to protect themselves from these risks. Given that there are various different ways to frame these risks, it is important to understand which types of messages are most effective at influencing consumer risk perceptions and encouraging consumers to act in a manner that reduces this risk. One potentially important framing technique that has not been heavily studied in an advertising context is temporal framing.

Aside from the advertisement itself (i.e., the message and how it is framed), marketing communication effectiveness can depend on individual characteristics of the consumer processing the ad. This is especially true for advertising and media campaigns concerning health issues. For instance, some consumers are effective at self-regulating their health-related behaviors. Meanwhile, others struggle with the self-discipline it takes to maintain good health, especially related to food choices. Given the recent media attention directed at the individual and societal risks of poor eating habits, it is likely that most consumers are aware of the health risks associated with an unhealthy diet. However, differences in how concerned individuals are with the longer-term potential risks of their behaviors and the extent to which individuals let such potential risks influence their decisions in the short-term, may play a strong role in the decision making process. This “temporal bias” can exert a dynamic influence on many judgments, decisions, and actions. The purpose of this research is to examine how individual differences in

temporal orientation may interact with temporal framing of advertising messages to influence consumers' risk perceptions, persuasiveness evaluations, and behavioral intentions.

Temporal Framing

There are many studies in marketing and psychology that demonstrate robust message framing effects across a variety of domains (for a review see Levin, Schneider, and Gaeth 1998). Prior research in the health domain has demonstrated that perceptions of message persuasion can be influenced by the differential framing of health-related outcomes (e.g., point of reference and fear framing effects; Block and Keller 1995). Health message framing effects have also been found to affect self-risk perceptions and attitude toward the health hazard (e.g., Menon, Block, and Ramanathan 2002; Keller et al. 2002).

There is also evidence that the *temporal* frame of the message can influence how a message is construed. One explanation as to why temporal framing (i.e., proximal or distal) of a message can influence consumer evaluations of the message can be drawn from construal level theory (CLT; Liberman and Trope 1998, 2003). CLT suggests that perceptions of temporal distance systematically alter the way future events are construed, and thus influence the evaluation and choices related to those future events. For instance, one explanation of why many consumers fail to take action to prevent health problems is that potential health risks are often perceived as occurring in the distant future. As an example, weight gain and adverse health problems that stem from an unhealthy diet typically develop over many years. According to CLT, if representations of a future health risk are made more proximal, and thus more concrete, consumers should be more likely to take the risk seriously and engage in preventive behaviors to minimize the risk. For example, Chandran and Menon (2004) demonstrated that the temporal framing of objectively neutral reference periods (e.g., day versus year) lead to differential

subjective perceptions of perceived psychological distance. Specifically, health risks represented in “day” terms are construed to be more threatening than those represented in “year” terms.

Participants reported higher risk perceptions for contracting mononucleosis (study 1) and cell phone radiation (study 2) when the day frame was used to communicate health risks as opposed to when the year frame was used.

Findings from Chandran and Menon (2004) demonstrate that the proximal framing of a health risk serves to increase risk perceptions by making the threat seem closer in time.

However, recent research suggests that some individuals have a chronic tendency to consider and protect themselves from risks that may not occur for many years, or that may never occur. It is unclear if the temporal framing effects discussed above would be consistent across consumers with varying levels of concern about future risks that may arise from their behaviors. The following section reviews the research on individual differences in time perspective and offers predictions on how the temporal frame of a health risk may influence those with strong (or weak) orientation toward the future.

Temporal Orientation

Apart from temporal framing, other studies focus on consumers’ *differences* in perceptual orientation toward time (e.g., Bearden, Money, and Nevins 2006; Joireman, Strathman, and Balliet 2006; Lasane and Jones 2000; Zimbardo and Boyd 1999). Systematic differences have been found in the time orientation literature that distinguishes between individuals who place a great emphasis on the immediate versus delayed consequences of their behaviors. Some consumers have a more ‘long-term’ perspective that renders future events as more concrete, resulting in differences in temporal attitudes and behaviors. Future-oriented consumers tend to attach a higher degree of importance to the future consequences of their actions, and less

importance to the immediate consequences, whereas, consumers who are more present-oriented attach a high degree of importance to the immediate consequences of their actions, and little importance to the delayed consequences of their actions. Consumers who are more future-oriented have been found to be better able to delay gratification (Strathman et al. 1994) and present-oriented consumers have been shown to be more impulsive in their behaviors (Jorieman, Anderson, and Strathman 2003). For example Strathman et al. (1994) examined how individual differences in consideration of future consequences (CFC) influenced consumers' attitudes toward offshore oil drilling. Findings show that consumers with high levels of CFC (i.e., long-term perspective) reported less favorable attitudes toward oil drilling than low-CFC consumers (i.e., short-term perspective).

Other recent studies have demonstrated that individual differences in time orientation can influence attitudes toward colorectal cancer screening (Orbell, Perugini, and Rakow 2004), likelihood to get tested for HIV (Dorr, Krueckeberg, Strathman, and Wood 1999), recycling behavior (Lindsey and Strathman 1997), and general concern for one's health (Strathman et al. 1994). The evidence in this growing body of literature seems to suggest that temporal orientation moderates perceptions of long-term versus short-term threats and reactions.

In Study 1, we test the prediction that the temporal frame of a health message may differentially affect individuals' risk perceptions depending on their level of future orientation. Consumer risk perception is an important and relevant variable for health communication studies (e.g., Keller 2006, Chandran and Menon 2004, Menon, Block, and Ramanathan 2002; Raghurir and Menon 1998). Specifically, we expect the temporal framing effect to be more pronounced for consumers who are less future-oriented. We reason that consumers who exhibit lower levels of future orientation should not be concerned with risks that may not materialize until sometime

later in the future. Based on findings from previous literature (e.g., Chandran and Menon 2004) and construal level theory, we expect that framing the risk in more proximal terms (as compared to the distal framing of the potential risk) will result in more sensitivity to the risk and, thus, higher reported risk perceptions for consumers with low levels of future orientation. In contrast, consumers who are future-oriented should be more sensitive to health risks that may not result for years into the future (e.g., the effects of poor dieting/exercising habits often take years to materialize). Thus, regardless of how the risk is framed, future-oriented consumers should report similar levels of risk perceptions across the temporal frame conditions. We expect future-oriented consumers to be influenced less by the temporal framing effect.

In sum, consumers with a strong future orientation should be less sensitive to the manner in which the advertising message is framed (e.g., proximal or distal frame) and should report consistent perceptions of risk regardless of the temporal frame of the advertisement. In contrast, those individuals who are less concerned with the future and the potential distant consequences of their present behaviors should report higher risk perceptions when the ad message makes the risk seem more proximal (near-future) in nature than when the message is more distant in nature. Specifically, H1 predicts the following:

H1: Consumers who are less future oriented will report higher levels of risk when the message is framed in more proximal (versus distal) terms. Consumers who score high on future orientation will report similar perceptions of risk across the temporal frame conditions.

Study 1

The purpose of Study 1 is to test predictions concerning the effects of the temporal frame of an advertising message and individual differences in future orientation on consumer risk perceptions. Specifically, temporal framing effects should be stronger for individuals who are not as apt to think about the future consequences of their behavior. Thus, a health communication

message framed in the near-future should help consumers who are less predisposed to think about the future consequences of their behaviors to consider the long-term risks of their behaviors.

Method

Procedure and Design

Participants in Study 1 were 59 undergraduate business students (mean age = 22 years; 64% female) enrolled at a major southern university and were given course credit for participating. A 2 (temporal frame) X 2 (future orientation) between-subjects experimental design was used to test predictions. Cell sizes for Study 1 ranged from 11 to 18 participants per cell. The temporal frame of the ad message was manipulated and future orientation was measured, as is explained in detail below.

Participants were informed that the purpose of the study was to evaluate a public service advertisement directed toward college students. After being briefed on the purpose of the study and given instructions, participants were shown a mock public service advertisement related to the potential health risks associated with eating fast food. The temporal frame of the ad message was manipulated by altering the time period in which the adverse health effects of high-fat, fast food meals may be detected. Participants were randomly assigned to one of two temporal frame conditions. The ad stated that the negative health effects of consuming unhealthy fast food can be seen in the short term (proximal frame) or in the long term (distal frame). The actual copy of the ad and manipulation is shown below. An example of the full ad stimulus is shown in Appendix 1.

More Healthy Food Choices Help Prevent (Immediate / Long Term) Health Risks. Good food choices can help you avoid (short-term / long-term) health risks!! In a study of high-fat fast food consumption, researchers at Yale University found evidence of damaged blood vessels and extreme spikes in harmful blood fat called triglycerides (within two hours after the consumption of a fast food meal / after years of frequent consumption of fast food). (Within two hours after the fast food meal / Over time), subjects also had higher blood pressure and reported lower energy levels than those who consumed (a lower-fat meal / lower-fat meals). The study concluded that eating (a healthy, low-fat meal / lower-fat meals) can help you prevent poor health in the (short term / long term). Want to prevent health risks...Avoid high-fat, fast food!

To add realism and credibility to the public service advertisement, a statement at the bottom of the ad reported, “This message is brought to you by the National Council on Nutrition and Exercise.” This statement and all other aspects of the advertisement other than the temporal frame manipulation remained invariant across conditions. After being exposed to the mock public service ad, participants were asked to complete the dependent measures section, the future orientation scale and a section of demographic questions. Upon completing the questionnaire, participants were debriefed and dismissed.

Measures

Manipulation Checks and Confound Check. To verify that the temporal frame manipulation made the risk of experiencing adverse health effects from fast food seem more proximal in time to participants, two different manipulation checks were taken at the end of the questionnaire along with the demographic questions. As a measure of the perception of the proximity of the risk, participants reported their perceptions of when the health risk occurs as (1) “very soon” versus “sometime much later” and (2) “the near future” versus “the distant future.” Seven-point semantic-differential scales were used to measure these two items. Reliability of this measure was adequate ($r = 0.96$). A second manipulation check asked participants to report the time period they

were focusing on as they considered the harmful effects of consuming fast food. This item was also a seven-point semantic-differential scale anchored with “hours” and “years.”

There was some concern that the proximal temporal frame condition would not be believable to participants (i.e., that noticeable negative effects of eating unhealthy foods could actually be detected within two hours after consuming the food). Believability of the ad was measured toward the end of the survey. Participants were asked to report on how believable the advertisement was on two seven-point semantic-differential scales anchored by “not very believable”/“very believable” and “not very credible”/“very credible.” These two items were also highly correlated ($r = 0.89$).

Future Orientation. After completing the dependent measures section, participants completed a 5-item future orientation scale. This scale is a subscale of the consideration of future consequences (CFC) scale developed by Strathman et al. (1994). Instructions asked participants to indicate whether or not five statements were characteristic of themselves by circling a number 1 (strongly disagree) to 7 (strongly agree) for each statement. Representative items included “I consider how things might be in the future, and try to influence those things with my day to day behavior,” and “I am willing to sacrifice my immediate happiness or well-being in order to achieve future outcomes.” The reliability estimate for this measure was acceptable ($Alpha = 0.70$). A median split was performed to distinguish between participants who demonstrated low versus high levels of future orientation. This procedure for categorizing subjects based on an individual difference factor is consistent with past research (e.g., Strathman et al. 1994; Joireman, Sprott, and Spangenberg 2005).

Dependent Variables. Participants’ risk perceptions were measured using three risk measures drawn from past literature (e.g., Keller, Lipkus, and Rimer 2003; Priya and Menon 1998; Menon,

Block, and Ramanathan 2002). The first risk measure was a probability estimate. This was a single item that asked participants to “estimate your own risk for experiencing negative health effects from consuming fast food that is high in calories and fat” on a 101-point probability scale anchored with “not at all probable” (0) and “very probable” (100) (Keller, Lipkus, and Rimer 2002). The second risk measure was a general measure of concern with the potential health risks associated with consuming unhealthy foods. Participants were asked to rate their “level of concern about the adverse health effects that can result from consuming fast food that is high in calories and fat” on two 7-point scales anchored with “not at all concerned”/ “very concerned” and “not at all worried”/ “very worried.” This measure demonstrated an adequate level of inter-item correlation ($r = 0.63$). The third and final risk measure tapped the perceived severity of the risks associated with eating unhealthy foods. This measure asked participants to “rate the magnitude of the risk of consuming food that is high in calories and fat” on a three 7-point items anchored with “not severe at all”/ “very severe,” “not serious at all”/ “very serious,” and “not frightening at all”/ “very frightening” (Chandran and Menon 2003). This measure was also reliable ($Alpha = 0.86$).¹

Results

Manipulation and Confound Checks. To check for efficacy of the temporal frame manipulation, an ANOVA using the two levels of temporal frame were run on the two manipulation check variables separately. Results yielded a significant main effect of temporal frame for both measures where the proximal frame was perceived as more close in time than the distal frame (F 's = 79.15 and 13.54 respectively, p 's < 0.01). Results also show that there was no difference between the two temporal frame conditions for believability of the advertisement ($F = 0.44$, $p > 0.20$). Both the proximal ($M = 5.46$) and distal ($M = 5.60$) conditions were rated as believable.

Also, a t-test was performed to test whether the temporal frame manipulation used in Study 1 influenced participants' responses on the future orientation scale. Results confirm that the manipulation did not have a significant impact on responses to the future orientation measure ($t = 0.65, p = 0.52$).

Tests of Predictions. Because specific a priori predictions were made in regard to differences in cell means, planned comparisons of means were used to test Study 1 predictions (e.g., Keppel 1991, p. 112; Kees et al. 2006).²

As shown in Table 1, and consistent with predictions, mean scores indicate that participants who do not typically consider the longer-term consequences of their behaviors (low future orientation; low-FO) reported increased levels of risk across the three risk measures when the ad message was framed in proximal (i.e., near-future) terms. Specifically, low-FO participants reported significantly higher probability of experiencing negative health effects when the health risk in the ad message was framed in temporally proximal terms ($M = 67.89$) than when the ad message was framed in temporally distal terms ($M = 50.00; t = 2.40, p < .05$).³ In contrast, participants who *do* typically consider the longer-term consequences of their behaviors (high future orientation; high-FO) reported similar probability estimates across the two temporal frame conditions ($M_{Temporal} = 47.64$ versus $M_{Distal} = 46.44; t = 0.10, p > 0.10$).

The same pattern of results was found for the risk variables of risk severity and concern. Low-FOs reported significantly higher levels of risk severity ($M_{Temporal} = 5.46$ versus $M_{Distal} = 4.48; t = 2.30, p < .05$) and concern ($M_{Temporal} = 5.29$ versus $M_{Distal} = 4.55; t = 1.86, p < .05$) when the health risks in the ad message were framed in temporally proximal terms than when the ad message was framed in temporally distal terms. In contrast, the temporal framing manipulation did not seem to influence the concern with the risks featured in the ad or the perceived severity

of risk for high-FOs ($p > .10$). Plots of the cell means relevant to these results are shown in Figure 1. These results provide support for H1; the more proximal framing of the health risk had a stronger effect on risk perceptions of individuals who were less future-oriented than on those who reported higher levels of future orientation.

Discussion

The purpose of Study 1 was to examine how the temporal framing of risk in advertisements affects consumers with varying levels of future orientation. Results support hypotheses in that the more proximal framing of health risk communication resulted in significant increases in risk perception for consumers who typically do not consider the future consequences of their behaviors (low-FOs). Participants who scored high on the future orientation scale (high-FOs) reported similar risk perceptions across the two temporal frame conditions. Findings from this study suggest that the advertising message framed in the near-future helped consumers who are not predisposed to think about the future consequences of their behaviors to consider the long-term risks of their behaviors.

It is interesting to note that high-FOs reported *higher* perceptions of risk severity than low-FOs ($F = 4.50, p < .05$) but marginally *lower* probability estimates ($F = 2.93, p < .10$) that they, themselves would experience the adverse effects of the risk (differences between low and high-FO for the concern variable were not significant). This finding is consistent with the conceptualization of future orientation. We would expect consumers who are more future oriented (more so than those who are less future oriented) to recognize the severity of the potential health risks of a regular diet consisting of unhealthy food. As a result of the consideration of these future risks, this segment is more likely to make lifestyle decisions that would lower their actual risk of experiencing the adverse effects of an unhealthy diet in the

future. However, because low-FOs do not typically consider future risks, this group would probably not be as concerned with trying to minimize this risk, and thus should have a higher probability of experiencing the negative consequences in the future.

Study 2

The purpose of Study 2 is to further examine the potential moderating effect of individual differences in future orientation on temporal framing using a different temporal frame manipulation and a slightly different health domain: obesity and weight gain. As noted in the introduction, obesity results in a substantial number of premature deaths every year and more than \$100 billion in direct and indirect annual health care expenses are a direct result from obesity and overweight (CDC 2007). Given the media attention to the obesity epidemic and the proliferation of diet plans and exercise machines on the market, managing body weight is clearly an important topic for many Americans. This study also seeks to extend the findings from Study 1 to other important dependent variables: consumers' perceptions of the persuasiveness of the advertisement and their behavioral intentions to act in a manner consistent with the ad. We also examine if perceived risk can mediate these effects.

Although consumer risk perception is an important variable in health advertising, it is also important to examine other variables related to consumers' evaluations of the advertising message and intentions to behave in a manner that is consistent with the advertisement. To this end, we are predicting effects similar to those observed in Study 1 for the risk variables, on persuasion and behavioral intentions variables in Study 2. Specifically, consistent with construal level theory and our conceptualization in Study 1, the proximal (i.e., near-future) framing of the ad message should increase the persuasiveness of the ad and intentions to engage in preventive behaviors for consumers who are less future oriented. In contrast, consumers who are more

future-oriented should report similar levels of persuasion and behavioral intentions regardless of the temporal frame of the message.

H2: Consumers who are less future oriented will a) be more persuaded by the ad and b) will report stronger intentions to engage in preventive behaviors when the message is framed in more proximal (versus distal) terms. Consumers who score high on future orientation will report similar perceptions of persuasiveness and behavioral intentions across the temporal frame conditions.

Study 1 results show that the proximal framing of an advertising message can increase consumer risk perceptions. However, this effect depends on individual differences in future orientation. Although the temporal framing effect on consumer risk perceptions can be moderated by future orientation, it is plausible that consumer risk may mediate the effects of temporal frame and future orientation on consumers' behavioral intentions. In other words, we predict that temporal framing and future orientation will affect consumers' intentions to engage in preventive health behaviors in the same manner as these variables influenced risk perception in Study 1. However, we also explore the potential for consumer risk perceptions to have a direct effect on behavioral intentions and the potential for risk to mediate the moderating effect observed in Study 1 on behavioral intentions. In sum, in Study 2, we examine the relationship between risk perceptions and behavioral intentions and the potential mediating effect of perceived risk on the interaction predicted in H2 on intentions.⁴ Below, we first discuss the expected risk-intentions relationship and then address the expected mediated-moderation prediction.

Hypothesis 3 predicts that consumers with higher perceived risk of weight gain will report higher intentions to engage in preventive behaviors to avoid the risk. Consumers who report lower perceived risk (i.e., those who are less concerned about gaining weight) should report lower intentions.

Our final hypothesis, Hypothesis 4, predicts that perceived risk will mediate the moderating effects of future orientation on behavioral intentions that are proposed in Hypotheses 2. Specifically, when the intervening variable of perceived risk is controlled for, we expect the direct effects of the interaction term on behavioral intentions to fall to a nonsignificant level, indicating mediation of the effects on intentions (Baron and Kenny 1986). We reason that although temporal framing and future orientation have an interactive effect on consumers' behavioral intentions, it is consumers' risk perceptions that accounts for these relationships (Cohen et al. 2003). Hypotheses 3 and 4 are stated below:

H3: High levels of perceived risk will result in higher intentions to engage in preventive behaviors.

H4: Perceived risk will mediate the effect of the temporal framing*future orientation interaction on consumers' behavioral intentions.

Method

Pilot Test

In order to test the proposed temporal frame manipulation and the reliability of the dependent measures used in Study 2, a pilot experiment was carried out. Sixty undergraduate business majors were shown a mock public service ad featuring temporal frame manipulations similar to what was used in the first study. A manipulation check measure asked participants “what is your perception of how near in time the threat of gaining weight is (how close or far away does it seem)” on seven-point scales anchored with “near future – distant future” and “very soon – sometime much later.” Results show that participants perceived the “proximal framed” condition as nearer in time ($t = 3.45, p < 0.05$) than the “distal frame” condition. In this pretest, measures for perceived persuasiveness of the ad and behavioral intentions (multi-item scale

measures are discussed below), demonstrated adequate levels of reliability (*Alphas* = 0.83 to 0.89). Pretest findings offered support for the manipulation and measures used in the study.

Procedure and Design

Participants in Study 2 were 56 first-year female students (mean age = 19 years) enrolled at a major southern university and were entered into a prize drawing for participating. Females were used in this study because it was thought that they would be most sensitive to an advertisement regarding weight gain and how to prevent it (the focus of Study 2 ad stimuli) (Potter et al. 2004). Data collection took place early in the fall semester. Given the nature of the proximal temporal framing manipulation, it was necessary to administer the survey to first-year students early in their first semester in college. The experiment was a 2 (temporal frame) X 2 (future orientation) between-subjects design. Cell sizes for this study ranged from 13 to 19 participants per cell. The temporal frame of the ad message was manipulated, as explained below, and future orientation was measured.

Participants were informed that the purpose of the study was to evaluate a public service advertisement directed toward college students. After being briefed on the purpose of the study and given instructions, participants were shown a mock public service advertisement pertaining to weight gain. The ad consisted of the heading “Take Note!” along with a picture of a female medical doctor dressed in scrubs. The text of the ad reported a fictitious study done at Yale University that found many college students experience significant weight gain while in college. The temporal frame of the advertisement was manipulated by altering the time in which the typical college student experiences weight gain as reported by the Yale study. Participants were randomly assigned to one of two temporal frame conditions; the ad stated that the typical student gained weight over 12 months (proximal frame) or 48 months (distal frame). The actual text of

the ad and manipulation is shown below. An example of the full ad stimulus is shown in Appendix 2.

A recent study conducted by researchers at Yale University found that college students are most likely to experience significant weight gain during the (first 12 months / 48 months) they are in college.

A decrease in physical activity due to a full class load and an unhealthy diet consisting of high-calorie fast food results in the typical college student consuming many more food calories per day than they burn. This leads to noticeable weight gain and an increase in body fat during the (first 12 months / 48 months) in college.

Fast Fact: The average college student gains a significant amount of weight in the (first 12 months / 48 months) they are in college!

To add realism and credibility to the public service advertisement, a statement at the bottom of the ad reported, “This message is brought to you by the National Council on Nutrition and Exercise.” This statement and all other aspects of the advertisement other than the temporal frame manipulation remained invariant across conditions. After being exposed to the mock public service ad, participants were asked to report their perceptions of the persuasiveness of the ad and their intentions to behave in ways consistent with the ad message. After completing the dependent measures section, participants completed the future orientation scale and a section of demographic questions. Upon completing the questionnaire, participants were debriefed and dismissed.

Measurement

Future Orientation. After the dependent measures were taken, participants completed the 5-item future orientation scale used in Study 1. The reliability estimate for this measure was acceptable ($Alpha = 0.74$). Consistent with Study 1, a median split was performed to distinguish between participants who demonstrated low versus high levels of future orientation.

Dependent Variables. Overall perceptions of the persuasiveness of the advertisement were measured using three items that have been used in past research (Menon, Block, and Ramanathan 2002). These seven-point semantic differential items were anchored with “not informative”/“very informative,” “not interesting”/“very interesting,” and “not useful to me”/“very useful to me.” This scale demonstrated adequate levels of internal consistency ($Alpha = 0.86$). Intentions to behave in a manner consistent with the ad message were measured with five items adapted from previous literature (Chandran and Menon 2004). These items were seven-point scales anchored with “strongly disagree”/“strongly agree.” These items included “After reading the ad, I am now more likely to make a more healthy food choice for lunch today,” “I am more likely to watch what I eat now than before reading this public service ad,” “I am likely to exercise more often now than before I read this advertisement,” “I intend on trying to learn more about college weight gain and how to stay fit,” and “I would be willing to sign up for a monthly email newsletter about college weight gain and how to avoid it.” These items were averaged to form the intentions measure ($Alpha = 0.81$). Finally, risk perception was measured using the same risk severity scale used in Study 1. This measure asked participants to “rate the magnitude of the risk of becoming overweight” on three 7-point items anchored with “not severe at all/very severe,” “not serious at all”/“very serious,” and “not frightening at all”/“very frightening” (Chandran and Menon 2003). This measure was also reliable ($Alpha = 0.90$).

Results

Confound Check. As in Study 1, t-test results confirm that the temporal frame manipulation did not have a significant impact on responses to the future orientation measure ($t = 0.86, p = 0.40$).

Tests of Predictions for Effects on Persuasion and Intentions. Consistent with Study 1, planned comparisons of cell means were used to test Study 2 predictions.⁵ As shown in Table 1, and

consistent with predictions, mean scores indicate that participants who reported lower levels of future orientation (low-FO) found the ad more persuasive when the ad message was framed in proximal temporal terms (i.e., 12 months) ($M = 5.36$) than when the ad message was framed in distal temporal terms (i.e., 48 months) ($M = 4.31$; $t = 1.72$, $p < .05$). In contrast, the temporal framing effect was weaker (and in the opposite direction) for participants who reported high levels of future orientation (high-FO; $M_{Temporal} = 5.32$ versus $M_{Distal} = 6.15$; $t = 1.55$, $p = .07$). Similar results were found for the behavioral intentions variable. Low-FOs reported stronger intentions to engage in preventive behaviors consistent with the advertisement when the message was framed in proximal terms ($M = 4.70$) versus when the risk was framed in distant terms ($M = 3.58$; $t = 1.76$, $p < .05$). However, high-FOs reported similar intentions scores across the temporal frame conditions ($M_{Temporal} = 4.74$ versus $M_{Distal} = 4.94$; $t = 0.37$, $p = .71$). Plots of the cell means relevant to these results are shown in Figure 2. These results provide support for predictions, in that the more proximal framing of the health risk had a stronger effect on persuasiveness perceptions and behavioral intentions of individuals who are less future-oriented than on those who reported higher levels of future orientation.

Test of the Mediating Effect of Risk. Hypotheses 3 and 4 concern the proposed relationship between risk and intentions and the proposed mediated-moderation effects. To determine if the risk construct mediates the temporal frame-future orientation interaction, four conditions must hold: 1) the predictor (interaction term; future orientation * temporal frame) must affect the dependent variable (behavioral intentions) in the predicted direction; 2) the predictor must affect the mediator (risk) in the predicted direction; 3) the mediator (risk) must affect the dependent variable (intentions); and 4) the impact of the predictor on the dependent variable must be

nonsignificant (*full* mediation) or reduced (*partial* mediation) after controlling for the mediator (Baron and Kenny 1986; Holmbeck 1997).

In terms of the first condition, results show that the temporal frame * future orientation interaction does significantly affect the outcome variable of behavioral intentions ($B = 0.98$, $t = 2.30$, $p < .05$). The effect of the predictor (i.e., temporal frame * future orientation interaction) on risk perceptions is also significant ($B = 0.55$, $t = 3.66$, $p < .01$). This finding supports condition two discussed above. The final conditions for mediation are tested through a comparison of two regression equations. The first equation consists of the future orientation, temporal frame, and the future orientation*temporal frame interaction term as predictors and behavioral intentions as the dependent variable. The second equation is identical to the first, but it adds the proposed mediator (risk) as a predictor. Prior to creating the interaction term for use in the equations, we first mean centered the future orientation and temporal frame measures before generating the product term (Aiken and West 1991).

For the first equation, there is a significant effect of the interaction term ($p < .05$). In the second equation, in which the proposed mediator of risk is included as an additional predictor, the risk measure is positive and significant ($p < .01$) which provides support for H3. Also, the future orientation*temporal frame interaction falls to a nonsignificant level ($t = 0.78$; $p > .10$). Given this difference between regression equations 1 and 2 (i.e., the interaction coefficient is significant in the first but not the second), there is evidence of *mediated moderation*, in which the inclusion of the risk construct mediates the temporal frame * future orientation moderating effect on the behavioral intentions dependent variable (Baron and Kenny 1986, p.1179). This finding supports Hypothesis 4.

Study 2 Discussion

The purpose of Study 2 was to replicate Study 1 findings on an extended set of dependent variables and to examine perceived risk as a mediator. Findings from Study 2 support predictions and further demonstrate that the effectiveness of temporal framing in an advertisement depends on individual differences in consumers' future orientation. Specifically, the more proximal framing of the ad message is more effective at influencing persuasion and intentions to engage in preventive behaviors for consumers with lower levels of future orientation. Consumers who tend to consider future consequences of their behaviors were less influenced by this manipulation. The pattern of results found in Study 2 was consistent with those found in Study 1.

Study 2 also found support for the prediction that consumer risk perception mediates interactive effect of temporal frame and future orientation on consumers' behavioral intentions. Findings suggest that consumers with high levels of reported risk for weight gain will report higher intentions to engage in behaviors to negate this risk. Results also found that, as predicted, when the intervening variable of perceived risk was controlled for, the interaction between temporal frame and future orientation fell to a non-significant level. This suggests a mediated-moderation model where perceived risk mediates the temporal frame-future orientation interaction on consumers' behavioral intentions.

General Discussion

The importance of communicating effective ways to make healthy food choices and manage body weight is evident given the severity of the obesity epidemic in the U.S. today (CDC 2007). Given that the USDA has committed approximately 500 million dollars per year through national nutrition educational campaigns, research examining the design of these

campaigns including what types of message appeals to use and how to frame particular messages to maximize effectiveness is important (USDA 2005; Food and Nutrition Services 2008).

The objective of this research was to examine a specific type of advertising message framing technique that may be effective at communicating health information to consumers. Specifically, we examined how the temporal frame of an ad message can influence consumers with varying levels of future orientation. Findings from our study offer theoretical contributions that shed light on specific conditions when temporal framing of health messages may be more effective at influencing risk perceptions, persuasion, and behavioral intentions. Specifically, findings show that the effectiveness of temporal framing techniques may depend on how concerned consumers are with the future consequences of their behaviors. Preliminary evidence from this research suggests that advertisers should consider the temporal frame of persuasive messages as they develop public service advertisements.

Combined results from the two studies show evidence that the proximal framing of risks in advertisements can increase perceived risk, persuasion, and can impact intentions to engage in preventive behaviors for consumers with low levels of future orientation. Consumers who reported high levels of future orientation were affected less by this framing effect. These findings are consistent with the conceptualization that future-oriented individuals typically have a higher level of concern regarding long-term risks. Consumers with lower levels of future orientation, by definition, are not as concerned with these future risks but become more concerned when the risk is framed in more proximal terms. This is an important finding as there are very few studies in marketing examining temporal framing effects, and no studies that examine these effects in an advertising context.

Although recent research in marketing has started to examine time orientation (i.e., Bearden, Money, and Nevins 2006), another important contribution of the studies presented here is the examination of the future orientation construct and its potential usefulness as a moderator of effects in advertising experiments. The finding that individual differences in future orientation can influence consumer evaluations of persuasive messages is consistent with prior time perspective studies in the psychology literature (e.g., Strathman et al. 1994; Dorr et al. 1999; Orbell et al. 2004). Future orientation can be an important construct in the marketing and advertising literature and in communication of persuasive health messages in particular.

The finding that consumer risk perceptions can mediate the temporal framing-future orientation interaction also has implications for theory. Such mediated moderation is not often explored in the advertising literature, but these findings indicate that the moderating role of future orientation on temporal framing for the behavioral intentions dependent variable is mitigated by consumer risk perceptions.

In terms of relevance for practical application, the mechanism of temporal framing seems important to examine within the realm of advertising, especially given the challenges faced by policy makers to increase the effectiveness of their communications. Creators of public service campaigns may find results from this study useful as they develop strategies to effectively provide information to Americans on how to manage their body weight. Persuasion techniques such as temporal framing that result in higher risk perceptions for consumers who typically are not concerned with future risks are important as the government continues to commit large amounts of resources to educating consumers through media campaigns.

Furthermore, the future orientation findings from this research may also be important for designing messages directed at specific target groups in the population. Because the future

orientation has been found to correlate with certain demographic variables (e.g., income, education level) the finding that this variable can moderate various message framing effects may be important for advertisers as well. It is unlikely that campaigns or public service advertisements can be targeted to individuals based on the degree to which they consider the future consequences of their behaviors, but these messages can possibly be targeted to specific populations based on income or education level. Additional research may examine if it is possible to prime temporal orientation in the context of advertising.

This research also has important implications for public policy. Considering that obesity is strongly linked to the top three causes of death for Americans (heart disease, cancer, and cerebrovascular ailments), a better understanding of how to inform and persuade consumers to make better decisions that take into account distant future health outcomes would clearly be beneficial to society at large (CDC 2007). Findings from this study may not directly result in improvements in public health, but perhaps may indirectly improve health outcomes through helping to increase the efficacy of health communications via a better understanding of effects on risk and persuasion.

Limitations

Although risk, persuasion, and behavioral intentions are important variables in advertising research, the level of consumer comprehension of the temporal realities of health risks was not directly examined in our two studies, but would be an important area for future research. Also, further research that examines actual behavioral changes based on the ad appeals studied in this research would be meaningful. Also, as with many advertising experiments, it is unclear if the effects reported in this study are enduring. In terms of practical implications of this research, it is important to study whether persuasive messages viewed over time as part of a specific campaign

can actually change consumer behavior (beyond measuring persuasion or behavioral intentions). It is unknown if the manipulations used in this research can create lasting impressions on participants beyond the short period of time directly after exposure to the stimuli. Future research may use methodologies that capture consumer responses over longer periods of time and/or attempt to capture actual behavioral change that may result from exposure to the manipulations.

Another limitation of our research deals with the external validity of the findings. The two studies discussed here took place in a controlled environment where participants were forced to read and pay attention to the experimental stimuli. Also, participants were only given a single exposure to the ad stimuli. Although this controlled context and environment provides experimental control and minimizes alternative explanations for the observed effects, findings may not be generalizable to a more natural environment. In particular, it is unknown if the findings would be as strong or as consistent in a low-involvement situation where other stimuli are competing for the consumer's attention or how repeated exposure to the ad might affect the findings. The use of student samples also limits the generalizability of our findings. Such concerns regarding external validity are common in academic studies on advertising. Future research may overcome this limitation through conducting the experiment in a more natural environment or having respondents view and respond to the manipulations along with a number of other ads and/or stimuli that are vying for the respondent's attention.

REFERENCES

- Aiken, Leona S. and Stephen G. West (1991), Multiple Regression: Testing and Interpreting Interactions, Newbury Park, CA.: Sage.
- Baron, Reuben M. and David A. Kenny (1986), "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic and Statistical Considerations," Journal of Personality and Social Psychology, 51, 1173-1182.
- Bearden, William O., R. Bruce Money, and Jennifer L. Nevins (2006), "A Measure of Long-Term Orientation: Development and Validation," Journal of the Academy of Marketing Science, 34 (3), 456-467.
- Block, Lauren G. and Punam Anand Keller (1995), "When to Accentuate the Negative: The Effects of Perceived Efficacy and Message Framing on Intentions to Perform a Health-Related Behavior," Journal of Marketing Research, 32 (2), 192-203.
- Center for Disease Control and Prevention (2007), "Prevalence of Overweight and Obesity Among Adults: United States, 2003-2004," accessed on September 14, 2007, http://www.cdc.gov/nchs/products/pubs/pubd/hestats/overweight/overwght_adult_03.htm
- Chandran, Sucharita and Geeta Menon (2004), "When a Day Means More than a Year: Effects of Temporal Framing on Judgments of Health Risk," Journal of Consumer Research, 31 (2), 375.
- Cohen, Jacob, Patricia Cohen, Stephen G. West, and Leona S. Aiken (2003), Applied Multiple Regression / Correlation Analysis for the Behavioral Sciences. 3rd Ed. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Dorr, Nancy, Sarah Krueckeberg, and Alan Strathman (1999), "Psychosocial Correlates of Voluntary HIV Antibody Testing in College Students," AIDS Education and Prevention, 11 (1), 14.
- Flegal, Katherine M., Barry L. Graubard, David F. Williamson, and Mitchell H. Gail (2005), "Excess Deaths Associated with Underweight, Overweight, and Obesity," Journal of the American Medical Association, 293 (15), 1861-1867.
- Food and Nutrition Services (2008), <http://www.fns.usda.gov>, accessed May 10, 2008.
- Holmbeck, Garyson N. (1997), "Toward Terminological, Conceptual, and Statistical Clarity in the Study of Mediators and Moderators: Examples From the Child-Clinical and Pediatric Psychology Literatures," Journal of Consulting and Clinical Psychology, 65 (4), 599-610.

- Joireman, Jeff, Jonathan Anderson, and Alan Strathman (2003), "The Aggression Paradox: Understanding Links Among Aggression, Sensation Seeking, and the Consideration of Future Consequences," Journal of Personality and Social Psychology, 84, 1287-1302.
- Joireman, Jeff, David Sprott, and Eric Spangenberg (2005), "Fiscal Responsibility and the Consideration of Future Consequences," Personality and Individual Differences, 39, 1159-1168.
- _____, Alan Strathman, and Daniel Balliet (2006), "Considering Future Consequences: An Integrative Model," in Judgments Over Time: The Interplay of Thoughts, Feelings, and Behaviors, eds. L. Sanna & E. Chang, Oxford: Oxford University Press.
- _____, Daniel Balliet, and David Sprott, "Consideration of Future Consequences, Ego-Depletion, and Decision-Making Preferences: Implications for the Self-Regulation of Behavior," unpublished manuscript.
- Kees, Jeremy, Scot Burton, Craig Andrews, and John Kozup (2006), "Effects of Alternative Cigarette Warning Messages and Graphic Visuals on Packaging: Implications for the Framework Convention on Tobacco Control," Journal of Public Policy & Marketing, 25(2), 212-223.
- Keller, Punam A. (2006), "Regulatory Focus and Efficacy of Health Messages," Journal of Consumer Research, 32 (5).
- _____, Isaac M. Lipkus, and Barbara K. Rimer (2003), "Affect, Framing, and Persuasion," Journal of Marketing Research, 40 (1), 54.
- Keppel, Geoffrey (1991), "Design and Analysis: A Researcher's Handbook," Englewood Cliffs, NJ: Prentice-Hall Inc.
- Lasane, Terell P. and James M. Jones (2000), "When Socially Induced Temporal Myopia Interferes with Academic Goal-Setting," Journal of Social Behavior & Personality, 15 (5), 75-86.
- Levin, Irwin P., Sandra L. Schneider, and Gary J. Gaeth (1998), "Not all Frames are Created Equal: A Typology and Critical Analysis of Framing Effects," Organizational Behavior and Human Decision Processes, 76 (2), 149.
- Liberman, Nira and Yaacov Trope (2003), "Temporal Construal Theory of Intertemporal Judgment and Decision," in Time and Decision: Economic and Psychological Perspectives on Intertemporal Choice, eds. G. Loewenstein, D. Read and R. Baumeister, New York: Russell Sage Foundation, 245-276.

- _____ and _____ (1998), "The Role of Feasibility and Desirability Considerations in Near and Distant Future Decisions: A Test of Temporal Construal Theory," Journal of Personality and Social Psychology, 75 (1), 5.
- Lindsay, James J. and Alan Strathman (1997), "Predictors of Recycling Behavior: An Application of a Modified Health Belief Model," Journal of Applied Social Psychology, 27, 1799-1823.
- Maheswaran, Durairaj and Joan Meyers-Levy (1990), "The Influence of Message Framing and Issue Involvement," Journal of Marketing Research, 27 (3), 361-368.
- Menon, Geeta, Lauren G. Block, and Suresh Ramanathan (2002), "We're at as Much Risk as we are Led to Believe: Effects of Message Cues on Judgments of Health Risk," Journal of Consumer Research, 28 (4), 533.
- Meyerowitz, Beth E. and Shelly Chaiken (1987), "The Effect of Message Framing on Breast Self-Examination Attitudes, Intentions, and Behavior," Journal of Personality and Social Psychology, 52 (3), 500.
- Orbell, Sheina, Marco Perugini, and Tim Rakow (2004), "Individual Differences in Sensitivity to Health Communications: Consideration of Future Consequences," Health Psychology, 23 (4), 388-396.
- Potter, Beth K., Linda L. Pederson, Stella S. H. Chan, Jo-Anne L. Aubut, and John J. Koval (2004), "Does a Relationship Exist Between Body Weight, Concerns About Weight, and Smoking Among Adolescents? An Integration of the Literature with an Emphasis on Gender," Nicotine & Tobacco Research 6 (3), 397-425.
- Raghubir, Priya, and Geeta Menon (1998), "AIDS and Me, Never the Twain Shall Meet: Factors Affecting Judgments of Risk," Journal of Consumer Research, 25(1), June, 52-63.
- Raghubir, Priya and Geeta Menon (1998), "AIDS and Me, Never the Twain Shall Meet: The Effects of Information Accessibility on Judgments of Risk and Advertising Effectiveness," Journal of Consumer Research, 25 (1), 52.
- Rothman, Alexander J. and Peter Salovey (1997), "Shaping Perceptions to Motivate Healthy Behavior: The Role of Message Framing," Psychological Bulletin, 121 (1), 3.
- Strathman, Alan, Faith Gleicher, David S. Boninger, and C. Scott Edwards (1994), "The Consideration of Future Consequences: Weighing Immediate and Distant Outcomes of Behavior," Journal of Personality and Social Psychology, 66 (4), 742.
- USDA Press Conference (2005), <http://www.healthierus.gov/dietaryguidelines>, Assessed on January 12, 2008.

Zimbardo, Philip G. and John N. Boyd (1999), "Putting Time in Perspective: A Valid, Reliable Individual-Differences Metric," Journal of Personality and Social Psychology, 77 (6), 1271.

Table 1

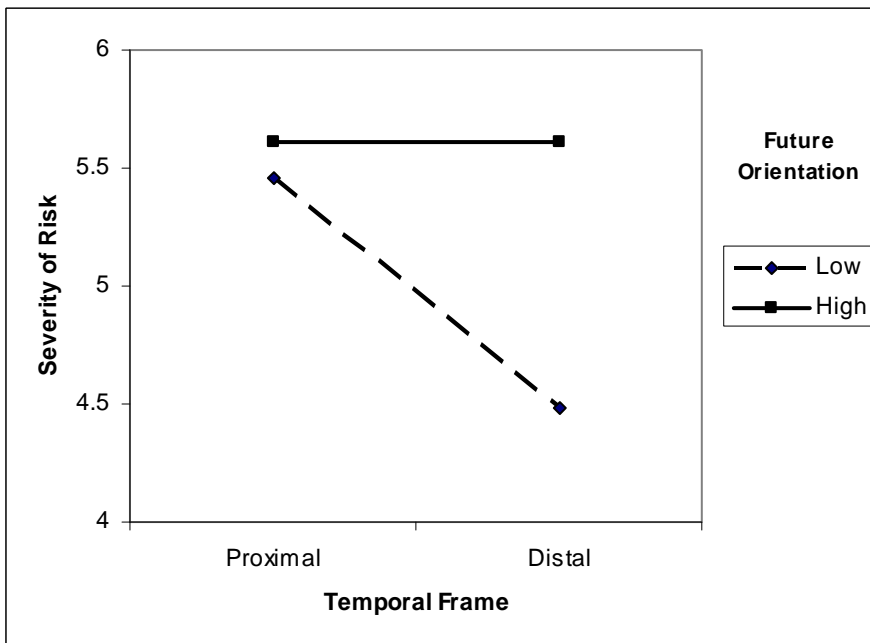
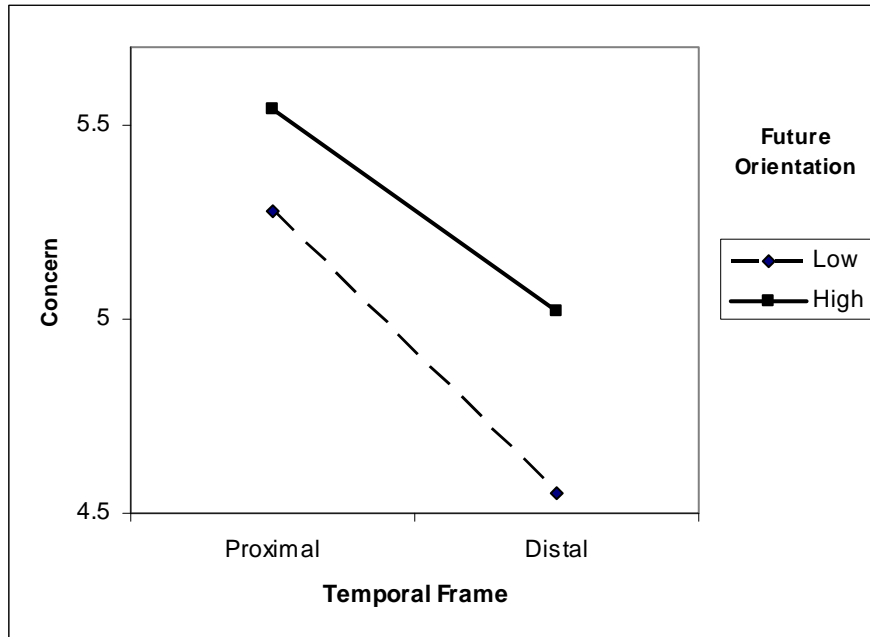
Cell Means (and Standard Deviations) for Dependent Variables

Dependent Variables	(a) Proximal Frame Low Future Orientation	(b) Distal Frame Low Future Orientation	(c) Proximal Frame High Future Orientation	(d) Distal Frame High Future Orientation
Study 1				
Concern	5.29 (1.10) ^a	4.55 (0.76) ^b	5.55 (1.15) ^a	5.03 (1.10) ^a
Risk Severity	5.46 (1.10) ^a	4.48 (1.33) ^b	5.61 (1.38) ^a	5.61 (0.81) ^a
Probability Estimate	67.89 (19.74) ^a	50.00 (19.62) ^b	47.64 (30.24) ^b	46.44 (31.31) ^b
Study 2				
Ad Persuasiveness	5.36 (1.21) ^a	4.31 (1.55) ^b	5.32 (1.83) ^a	6.15 (1.07) ^a
Behavioral Intentions	4.70 (1.52) ^a	3.58 (1.31) ^b	4.74 (1.73) ^a	4.94 (1.32) ^a

Superscripts adjacent to the means in the Table indicate significant differences according to SNK pairwise comparisons ($p < .05$ or better). For example, the superscript for the “a” cell (low future orientation participants in the proximal frame condition) indicates that the ad persuasiveness mean is significantly different from the mean for the cell labeled “b”.

Figure 1

The Effect of Temporal Framing and Future Orientation on Ad Persuasiveness and Behavioral Intentions



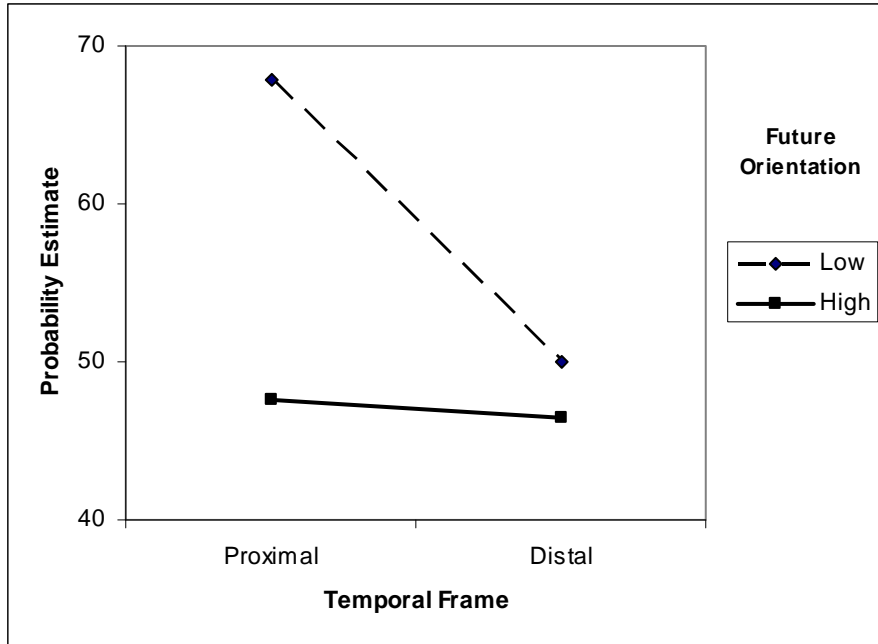
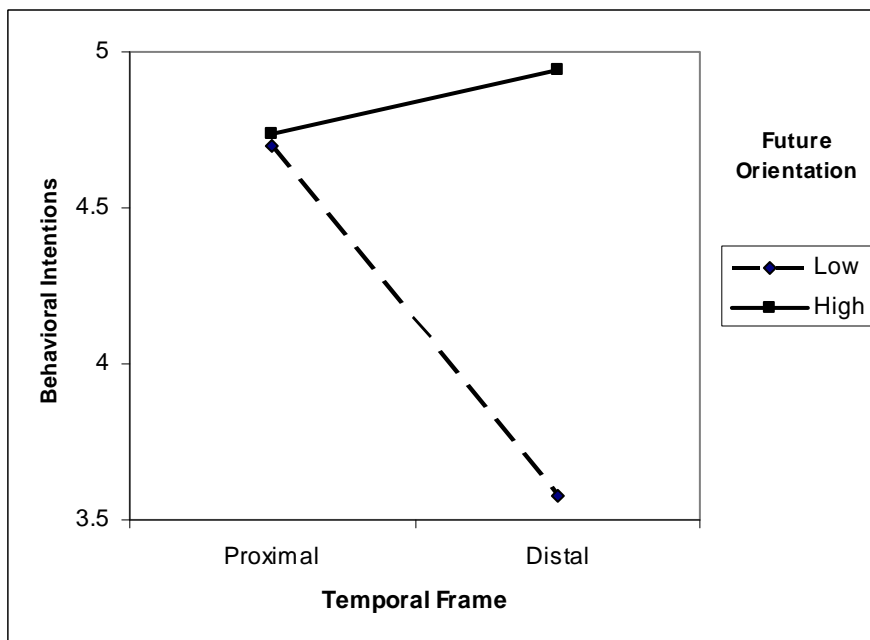
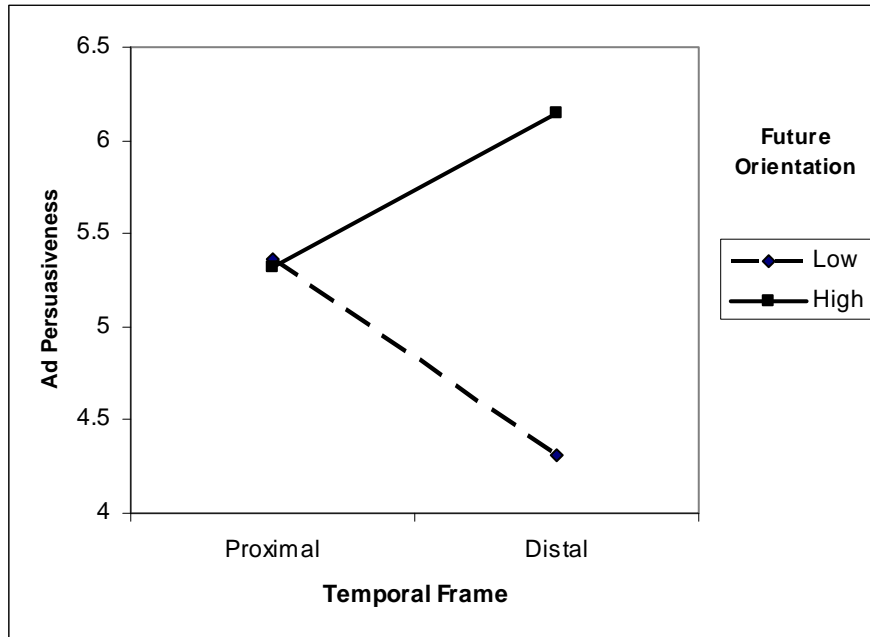


Figure 2

The Effect of Temporal Framing and Future Orientation on Ad Persuasiveness and Behavioral Intentions



More Healthy Food Choices Help Prevent Immediate Health Risks



Good food choices can help you avoid short-term health risks!!

In a study of high-fat fast food consumption, researchers at Yale University found evidence of damaged blood vessels and extreme spikes in harmful blood fat called triglycerides *within two hours* after the consumption of a fast food meal. Within two hours after the fast food meal, subjects also had higher blood pressure and reported lower energy levels than those who consumed a low-fat meal.

The study concluded that a healthy, low-fat meal can help you prevent poor health in the *short term*.

Want to prevent health risks....



Avoid high-fat, fast food!!!

This message is brought to you by the National Center for Nutrition and Disease Prevention.

TAKE NOTE !

A recent study conducted by researchers at Yale University found that college students are most likely to experience significant weight gain during the first 12 months they are in college.

A decrease in physical activity due to a full class load and an unhealthy diet consisting of high-calorie fast food results in the typical college freshman consuming many more food calories per day than they burn. This leads to noticeable weight gain and an increase in body fat during the first 12 months in college.



FAST FACT:

The average college student gains a significant amount of weight in the first 12 months they are in college!

BOTTOM LINE: To maintain a healthy body weight and good health, exercise regularly and eat a balanced diet low in fat.

This message is brought to you by the National Council on Nutrition and Exercise.

Endnotes

1. The three risk dependent variables were not significantly correlated with one another: probability estimate and concern ($r=0.001$), probability estimate and severity ($r=0.195$), and concern and severity ($r=0.045$).
2. ANOVA results showed a significant main effect of temporal frame on concern ($F=4.92$, $p<.05$) where the proximal frame resulted in higher levels of concern for the health risk. This analysis also yielded a significant main effect of future orientation on risk severity perceptions ($F=4.50$, $p<.05$) and a marginally significant main effect on the probability estimate ($F=2.93$, $p<.10$). Participants who consider the future consequences of their behaviors reported higher levels of concern about the health risk yet reported lower a probability of realizing the health risk.
3. One-tailed tests were performed on all planned contrasts in this research (Lee and Aaker 2004).
4. For H3 and H4, we focus on specifically on the behavioral intentions DV and not persuasion. These two variables are conceptually different and we have no reason to expect risk perceptions to influence perceived persuasion of the advertisement.
5. ANOVA results showed a significant main effect of future orientation on ad persuasiveness ($F=6.28$, $p<0.05$) and a marginally significant main effect on behavioral intentions ($F=2.89$, $p<0.10$). Participants who consider the future consequences of their behaviors reported higher perceptions of ad persuasion and intentions to behave in a manner consistent with the ad. There was also a marginal temporal frame by future orientation interaction ($F=3.51$, $p<0.10$).