Published in final edited form as:

J Consum Psychol. 2009 October 1; 19(4): 629–642. doi:10.1016/j.jcps.2009.01.002.

Memory Issues Pertaining to Social Marketing Messages about Behavior Enactment versus Non-enactment

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Budgets for social marketing campaigns are often dwarfed by the amounts spent on competing messages. Therefore, message efficiency - i.e., the ability to achieve desired outcomes with the lowest possible frequency and duration of exposure - is crucial in social marketing contexts. For example, the Center on Alcohol Marketing and Youth (2004) estimates that for every \$1 spent on responsibility ads in 2002, the alcoholic beverage industry spent \$99 on product ads. Similarly, the Campaign for Tobacco-Free Kids reported that the tobacco industry spends \$23 on promoting cigarette consumption for every \$1 spent on prevention initiatives (Lindblom, 2005). Constant turnover among the audiences targeted by youth interventions also motivates the need for efficiency, especially given the rapid decay in desirable outcomes that has been observed when programs are terminated (Sly et al., 2005). Given the budgetary limitations and market turnover challenges they face, it is imperative that social marketers understand how to develop messages that are maximally efficient.

Prior literature pertaining to social marketing message strategy has examined the distinction between anchoring positively versus negatively framed messages to specific health descriptors (e.g., smoking, unprotected sex). However, this distinction and its consequences for strategy are still poorly understood and results have led to conflicting recommendations as to which type of message frame is more effective (Chang, 2007). On one side, Rothman and Salovey (1997) argue that positive, gain-framed messages emphasizing the certain benefits of healthy behaviors (e.g., eating 5 servings of fruits and vegetables each day reduces cancer risks) will be more effective in prevention contexts than loss-framed messages focusing on the negative aspects of unhealthy behaviors (e.g., failure to eat 5 servings of fruits and vegetables each day increases cancer risks). Schneider et al.'s (2001) study of framing effects in tobacco control advertisements and Reinhart et al.'s (2007) examination of responses to messages about organ donation also support this view. On the other side, three comprehensive studies of tobacco use prevention messages (Goldman & Glantz, 1998; Pechmann et al., 2003; Teenage Research Unlimited, 1999) explicitly contradict the assertion of positive message superiority. While each of these studies reaches a different conclusion about the best theme to use, all recommend decidedly negative strategies focusing on the costs/losses associated with tobacco use. Thus,

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there remains considerable uncertainty regarding the design of maximally effective promotion messages for health-related behaviors.

One potential reason for the mixed results is that prior research all but ignores the nature of the behavior the message is designed to encourage (i.e., whether the behavior involves enactment or non-enactment). This has likely occurred because much of this research has focused on message framing effects within a specific behavioral domain, such as tobacco use prevention or breast cancer screening. As a result, theoretical factors that might allow generalization across domains are often poorly specified. Of particular interest in this article is the fact that enactment and non-enactment behaviors tend to be denoted by words that vary in linguistic form. Whereas enactment behaviors are typically denoted by linguistic affirmations (e.g., smoking, drinking, active, protected [sex]), non-enactment behaviors are typically denoted by affixal negations (nonsmoker, nondrinker, inactive, unprotected [sex]). Hence, linguistic form provides a conceptual basis for considering how the nature of the target behavior may affect message efficacy across behavioral domains.

The linguistic distinction between enactment and non-enactment word concepts is particularly important in social marketing contexts wherein the ultimate goal of most campaigns involves promoting a binary behavioral outcome, rather than a frequency or quality of behavior. For example, social marketing campaigns may promote enactment behaviors such as wearing seatbelts, getting breast cancer screenings, or wearing sunscreen; or they may promote non-enactment behaviors such as refraining from smoking cigarettes, littering, driving while intoxicated, or unprotected sex. This binary view of behavior implies that social marketers often face a basic managerial choice in message strategy: should messages be designed to address the enactment or non-enactment of the target behavior?

This article examines efficiency differences that may be associated with the use of messages about enactment versus non-enactment. More specifically, we explore whether and how the linguistic form of the behavioral descriptor to which benefits/gains and costs/losses are intended to be linked affects message efficiency. Pertinent literature is briefly reviewed to establish differences in how people process and store linguistically affirmative word concepts, relative to linguistically negated word concepts. These differences are then related to word concepts denoting behavioral enactment and non-enactment, respectively. Two experiments are reported to examine the ease with which associations may be stored, accessed and used to guide relevant behaviors. We consider the implications of these results in terms of message efficiency for social marketing campaigns regarding enactment versus non-enactment of behavior.

BACKGROUND AND CONCEPTUAL FRAMEWORK

Before discussing why messages regarding enactment versus non-enactment are likely to differ in their efficiency, it is important to recognize that beliefs, which serve as basic determinants of behavior (Fishbein & Ajzen, 1975), are comprised of knowledge structures stored in semantic memory. From the standpoint of associative network models of belief formation and storage (e.g., Collins & Loftus' 1975 Associative Network Model; see Neely, 1991 for a review), a belief consists of an object node representing a specific social descriptor or usage behavior (e.g., smoker, active), and one or more association nodes representing the adjectives and outcomes that are linked with the object node in memory. For example, an individual's belief that smokers are gross, dumb, and sickly is stored in memory as the object node "smokers" with links to the association nodes "gross," "dumb," and "sickly". Efficiency is therefore determined by how readily a message succeeds in creating linkages in memory between the targeted behavioral descriptor and one or more adjectives or outcomes (Experiment 1) and how easily learned associations are accessed (Experiment 2). Such memory

linkages are important as they are often determinants of behavior, particularly when behavior is impulsive as might be the case when self-regulatory resources are depleted (Hofmann, Strack, & Deutsch, 2008; Strack & Deutsch, 2006).

Linguistic Distinctions between Enactment and Non-Enactment Word Concepts

With few exceptions, word concepts relating to enactment are linguistically affirmative while those relating to non-enactment are linguistically negated. Linguistically affirmative word forms generally denote objects, actions, or states of being related to what something is or does. Words like “fiction”, “alcoholic”, and “healthy” are examples of linguistic affirmations. In contrast, words like “nonfiction”, “nonalcoholic”, and “unhealthy” are examples of affixal negations, denoting objects, actions, or states of being that are generally related to what something is not or does not do (see Horn, 1989). The defining characteristic of linguistically negated words relates to the presence of a negating affix (e.g., “non-”, “un-”) at the beginning of a word that contains an affirmative root word. Words that are classified as affixal negations may be positive, negative, or neutral in evaluative valence (e.g., nonsmoker, unhealthy, nonfiction, respectively). In addition, although a few words denoting the absence of something do maintain an affirmative structural form (e.g., the term vegetarian is affirmative in structural form yet suggests the absence of meat in one’s diet; the term virgin also has an affirmative form and a negated meaning), this paper focuses on those words that are considered negations by virtue of both their meaning and structural form. This is consistent with many social marketing contexts in which no affirmative word form exists to denote non-enactment (e.g., no widely accepted terms exist in an affirmative linguistic form for concepts such as nonsmoker and unprotected sex).

Related Research on the Processing of Negations—Research on memory effects related to negations has primarily focused on phrasal negations (e.g., phrases that are negated by virtue of their falsehood, or phrases containing negating terms such as, “not,” as in “not difficult to use”). The process of determining a statement to be false involves the formation of a transient representation of the statement that is independent from the negating tag (Fiedler, et al., 1996; Gilbert, 1991). This transient representation (which lacks the negation) may become incorporated in memory, affecting subsequent recall. For example, after viewing a videotape portraying the interior of a house, participants in Fiedler et al.’s (1996) experiment had to determine the truthfulness of statements regarding the presence or location of objects that may have appeared in the house. Of interest were those statements that were false. Results show that after a delay, respondents falsely indicated recalling objects as being in the house that they had previously correctly indicated were in fact not present. These affirmative intrusions (false recognitions) provide evidence that a negating tag (this statement is false) is stored independently from the statement itself (e.g., the umbrella stand was in the corridor), and is differentially accessible at time of retrieval.

Research within the consumer literature indicates that the effectiveness of brand claims using phrasal negations depends on processing resources (Grant, Malaviya, & Sternthal, 2004). When cognitive resources are high, the consumer is most likely to evaluate the full implication of a brand claim phrased with a negation. When cognitive resources are moderate, only the affirmative component of a phrasal negation is accessible during judgment; thus, a brand is evaluated more favorably when the phrasal negation is negatively valenced (e.g., “not easy to use”) than when it is positively valenced (e.g., “not difficult to use”). These findings support the idea that the negating tag is stored independently of the remaining phrase and may be differentially accessible at time of judgment. Consistent with this, increased syntactic complexity, which is characteristic of phrasal negations, has been shown to impair memory for brand claims (Bradley & Meeds, 2002), especially when product category involvement is

relatively low (Chebat, Gelinias-Chebat, Hombourger, & Woodside, 2003; Lowrey, 1998; 2006).

Studies of phrasal negations point to the importance of understanding negations in consumer contexts, but these findings cannot be generalized to the questions posed here about affixal negations. Phrasal negations involve multiple words and syntax structures where the negating tag is clearly separated from the remainder of the phrase. In contrast, affixal negations often provide no clear separation between the negating affix and the affirmative root (e.g., nonsmoker and unhealthy appear as discrete terms). Thus, the processing and storage of affixal negations as constituent elements require the deconstruction of a discrete term into its component parts - i.e., the negating affix plus the affirmative root word as in “on” plus “smoker.” As we explain below, the differential processing and storage of affirmations as compared to negations can be expected to affect the relative efficiency of knowledge structure formation and the accessibility of stored associations, even under high resource processing conditions.

Consumer Processing of Linguistic Affirmations and Negations—From a linguistic perspective, one important distinction between affirmations and their negated counterparts pertains to the number of morphemes, or meaning units, comprising the words. Whereas many enactment-related affirmations consist of one morpheme (e.g., smoker, healthy), affixal negations are always composed of two or more morphemes because negating affixes, such as “non-” and “un-”, are considered to be distinct morphemes (Horn, 1989). For example, nonsmoker and unhealthy are each composed of two morphemes.

Words consisting of one morpheme are referred to as being morphologically simple whereas words consisting of two or more morphemes are referred to as being morphologically complex. Morphologically simple words are stored directly in memory as discrete nodes. In contrast, empirical evidence from the linguistics literature suggests that morphologically complex words are often processed and stored as a set of constituent elements (e.g., nonsmoker is stored as “non” and “smoker”), rather than a single discrete node in memory (Libben et al., 1999; Libben et al., 2003). More specifically, words containing common affixes that do not alter the way their roots are spelled or pronounced (e.g., affixal negations such as nonsmoker) tend to be processed and stored as constituent morphemes (Altmann, 2001; Melinger, 2001; Vannest & Boland, 1999; Vannest et al., 2002; Vannest et al., 2005). Constituent representation of this type is critical for language acquisition, as learning only a finite set of word stems and affixes, along with the rules that govern how affixes can be used, allows for the generation (add “s” or “es” for plural forms and “ed” for past tense - Berko 1958) and comprehension of other tenses and morphologically complex words, even if they have not been encountered previously. Constituent representation is also beneficial because it requires less total storage capacity (Pinker 1999).

Freeman and Shapiro (2002) provide direct evidence for the constituent representation of affixal negations through the use of an intrusion measure that is similar to the one utilized by Fiedler et. al. (1996). After exposure to a list of novel affirmative (dord) and negated (nondord) words, respondents completed a recognition task. Some of the words from the exposure list appeared in the opposite linguistic form in the recognition list (e.g., a word that appeared as a negation in the exposure list appeared as an affirmation in the recognition list; a word that appeared as an affirmation in the exposure list appeared as a negation in the recognition list). The higher rate of intrusions observed for linguistic negations (e.g., falsely indicating recognition of an affirmative word from the exposure list [dord]) when in fact they had seen the word with a negating affix [nondord]), supports the contention that affixal negations are deconstructed at encoding (non + dord) and stored as two discrete units, with the root word being accessible without the negating affix at time of retrieval.

In sum, a wealth of available evidence demonstrates a clear distinction in the manner in which affirmations and negations are processed and stored in memory.

Discrete Versus Constituent Representation—From an associative memory perspective (c.f., Collins & Loftus, 1975; Novick & Hurley, 2001), the distinction between discrete representation (i.e., word concept storage as a single or polymorphemic unit) versus constituent representation (i.e., word concept storage as two or more constituent units) has important implications for the formation and operation of consumer knowledge structures. For word concepts that are stored as discrete units in memory, processing should involve direct activation (or priming) of the node representing the word concept. This activation should then spread from the word concept node to associated nodes, resulting in the direct retrieval of the concept's meaning (from stored associations). For our purposes, the processing of word concepts represented by a single, discrete node in memory is hereafter referred to as direct activation (aka – direct access or priming).

When a morphologically complex word is stored in memory as constituent nodes, processing the word involves “decomposition and computation” in working memory (Libben et al., 1999). The consumer cannot directly access the word from long term memory. Instead, the consumer perceives the constituent units that make up the complex word, thus activating the units in long term memory. The full meaning of the word is computed in working memory from the constituent parts. For example, if “nonsmoker” is represented in memory by its constituent units, then determining its meaning would require decomposing the concept, accessing the nodes “non-” and “smoker” and making sense of their relationship. As an additional example, think about how you would process a novel person descriptor such as “nondorben”, as in, he is nondorben. Did you process this word as one unit? Or did you decompose the word into its constituent parts (non + dorben) to make sense of the word and know that at a minimum it means that the person is not dorben? Doing the latter would lead to constituent representation. For our purposes, the processing of word concepts that are represented by constituent nodes in memory is hereafter referred to as indirect activation (aka - indirect access, indirect priming, or decomposition and computation).

Affirmation, Negation, and Social Marketing Campaigns—The specification of differential memory representation for affirmations as compared to negations has an important practical implication: it suggests that consumers' success in creating and accessing knowledge structures will vary based on the linguistic form of the enactment (or non-enactment) word concept emphasized in a given message. As knowledge structures become more complex, requiring a greater number of linkages between concepts, their development and retrieval should become more difficult. Hence, it should be relatively easy to develop/retrieve knowledge structures that are anchored by affirmations versus their negated counterparts. For affirmations, creation/retrieval of a knowledge structure requires the formation/activation of one linkage between two discrete nodes in memory (e.g., smoker - smelly). In contrast, the development/retrieval of a knowledge structure for affixal negations is more complex in that it requires the formation/activation of linkages between three discrete nodes in memory: the affixal negation's two constituent nodes and an associated concept (e.g., non - smoker - healthy). Thus, in terms of the development and retrieval of knowledge structures, we hypothesize:

H1: Consumers are more (less) likely to succeed in learning specific associations that comprise knowledge structures when the target, anchoring concept is linguistically affirmative (negated).

H2: Consumers will find it relatively easy (hard) to retrieve learned associations that are linked to linguistically affirmative (negated) word concepts.

These hypotheses can be summarized as predicting an efficiency advantage for messages focused on linguistically affirmative, enactment-related word concepts (smoker, active, protected) in comparison to their negated, non-enactment-related counterparts (nonsmoker, inactive, and unprotected [sex]). To ensure that any observed affirmation advantage could not be attributed to message factors identified in previous research on message framing, we also examined the valence of the target behavior, the valence of the message, and message modality (Costley & Brucks, 1992; Wyer, Hung, & Jiang 2008).

RQ: Do behavior valence, message valence, and/or message modality moderate the ease with which consumers learn associations with affirmative and negated social marketing word concepts?

EXPERIMENT OVERVIEW

To test our hypotheses, two experiments were conducted. The first experiment is designed to test H1 as well as the research question, RQ. Specifically, Experiment 1 utilizes simulated television advertisements to investigate adolescents' abilities to develop knowledge structures for health-related descriptors that are represented by linguistic affirmations (e.g., smoker) versus linguistic negations (nonsmoker). We chose adolescents as the participant population for the first experiment because many health promotion campaigns are targeted at this age group because they are beginning to make their own health-related decisions (Wills et al., 2004). Experiment 2 is designed to test H2. Specifically, reaction time measures are used to assess the relative ease with which young adults are able to access associations with linguistic affirmations versus negations from memory. We chose young adults as the participant population for the second experiment because their knowledge structures tend to be relatively stable and well developed, which should ensure a conservative test of our prediction.

EXPERIMENT 1

Method

The experiment used health-related descriptors, simulated advertisements, and participants (seventh graders) who are at the age that health decisions are starting to be made on their own (Wills et al., 2004). The procedure involved exposing participants to behavioral descriptors and sequences of outcome-related terms and images in a manner that roughly approximates the form and content of TV ads, and then measuring the extent to which youths were able to successfully form linkages between the terms and images and the behavioral descriptors in memory.

Participants—Participants (N = 150) were recruited from a middle school in the Mid-Atlantic region of the United States. All participants were seventh graders (ages 12–13); 53% were female.

Design—The experiment involved a $2 \times 2 \times 2 \times 2$ mixed-factorial design with three within-subject factors and one between-subjects factor. Evaluative valence of the health descriptors (whether a descriptor denotes a positive behavior such as “active” or a negative behavior such as “smoker”), message valence (whether the terms and images to be linked to the descriptors were positive or negative), and modality of the message claims (terms or images) were manipulated in order to test the robustness of the effect of linguistic word form on the development of knowledge structures. These variables served as the within-subject factors. Linguistic form of the health descriptors (affirmations or affixal negations) served as the between-subjects factor. A 4-level message claim ordering factor was also utilized; however, subsequent analysis showed that claim order did not have a significant effect on the development of knowledge structures, so data were aggregated across orders.

As we detail in the section on advertising stimuli below, the design was operationalized by having participants view four hypothesis-relevant advertisements. For participants in the (negated) affirmative descriptor condition, these ads were for (non)smoker, (non)alcoholic, (in)active, and (un)protected. To allow us to examine the effects of message valence and modality, each of these ads included one positive term (e.g., proud), one negative term (e.g., grief), one positive image (e.g., a picture of puppies) and one negative image (e.g., a picture of a stabbing knife). Importantly, we used the same set of terms and images in the ads for the affirmative and negated forms of a given health descriptor. For example, the terms proud and grief and the images of puppies and of a stabbing knife were used in the ads for both linguistic word form conditions for a given health descriptor (smoker and nonsmoker). This aspect of the design allowed us to directly assess the degree to which linguistic form of the health descriptors affected memory for the terms and images.

Procedure—Participants (each of whom had previously received parental consent) were excused from class, brought to a computer lab in their school, and asked to sit in front of a laptop computer. After completing an assent form, participants were told that they would be shown a series of six “draft” advertisements on the computer screen. Because prior research has shown that a lack of motivation to process phrasal negations (and other forms of syntactically complex brand claims) can help to explain observed memory differences (Lowrey, 1998; 2006), we wanted to ensure that all participants would be motivated to try to encode the simulated message claims comprising the advertisements. Therefore, all participants were told that they would be given a memory test later in the experiment to assess their ability to correctly remember which terms and images appeared with which advertisement. This aspect of the protocol was intended to motivate all participants to exert a high level of mental effort to process the advertisements. It was also meant to provide a strong test of our hypothesis since the detrimental effect of syntactic complexity on memory has been shown to go away under conditions of relatively high motivation (Lowrey, 2006).

After being told that their memories for the advertisements would be tested, participants viewed the six advertisements, including four hypothesis-relevant advertisements pertaining to health-related descriptors and two filler advertisements. After viewing the simulated ads, participants completed a three-minute distracter task, a length determined to be sufficient to clear short term memory. Memory measures, as well as measures assessing message claim valence and descriptor-outcome relatedness, were then administered.

Advertising Stimuli—Participants were randomly assigned to health descriptor conditions such that approximately 50% viewed advertisements for linguistically negated health-related descriptors, and the remaining participants viewed advertisements for affirmative health-related descriptors. For all participants, two of the descriptors were evaluatively positive (i.e., nonsmoker, nonalcoholic in the negated health descriptor condition; active, protected in the affirmative health descriptor condition) and the other two were evaluatively negative (inactive, unprotected in the negated health descriptor condition; smoker, alcoholic in the affirmative health descriptor condition). All participants were also shown two filler ads for non-health related concepts in order to help mask our interest in the health-related messages.

Each hypothesis-relevant advertisement began by presenting a health-related descriptor (e.g., “smoker”) in large font on the top of the computer screen. Then, with the descriptor still at the top of the screen, a series of four message claims were presented one at a time, two visual (e.g., a picture of puppies, a picture of a hand wielding a knife in a stabbing fashion) and two verbal (e.g., the word “proud”, the word “grief”). The order of message claim presentation intermixed visual images and verbal terms to simulate the frequent transitions that are common in ads targeting adolescents. One of the verbal terms and images in each health-related ad was positive and the other negative. Advertisements ended with the simultaneous presentation of the

descriptor and all four message claims. Each advertisement lasted approximately 26 seconds. A storyboard for the ad about “smoker” is shown in the Figure.

Measures

Memory Measures—To assess the effect of linguistic word form on the development of knowledge structures, a memory measure was collected. This measure gauged the extent to which exposure to the simulated ads create linkages in memory between the health-related behaviors being promoted and the message claims appearing in each ad. Administration of the measure involved presenting each term and image that had previously appeared in the health-related ads, and asking participants to select the ad in which the term or image had appeared - the ad for smoker, active, protected, or alcoholic (or the ad for nonsmoker, inactive, unprotected, or nonalcoholic). Terms and images were presented one at a time on the computer screen; the order of presentation was randomized to ensure that it did not provide a valid recognition cue. To analyze participants’ performance on the memory test, the total number of correct responses for the two positive terms, two negative terms, two positive images, and two negative images for both the evaluatively positive and evaluatively negative health descriptors were used as the within-subject measures of memory performance. Higher scores indicate a greater impact on the development of knowledge structures at a constant level of exposure.

Measures of Message Claim Valence—Measures of message claim valence involved asking participants to rate the extent to which each term and image used in the health-related ads was positive/negative (on a 7-point semantic differential scale).

Descriptor-Outcome Relatedness—Terms and images were selected for use as message claims based on the criterion that participants would be unlikely to hold pre-existing associations between the terms or images and the health-related descriptors used in the experiment. For example, the word “proud” was used as a term and a picture of puppies was used as an image in the ad for smoker/nonsmoker¹. However, since perceived relatedness could affect the formation of knowledge structures (Sakamoto & Love, 2004), a measure of the relatedness between health descriptors and outcome terms and images was collected. For each health-related ad, participants were asked to rate the extent to which each term (image) was related to the behavioral descriptor (on a seven-point scale, ranging from 1 = “unrelated” to 7 = “closely related”). Subsequent analysis showed this measure to be a non-significant covariate; therefore, it will not be discussed further.

Results

An alpha level of .05 was used in all analyses to determine statistical significance. Unbiased measures of effect sizes, namely Cohen’s f and unbiased d (Hedges & Olkin, 1985; Kelley, 2005), were used to determine effect size, where f values of .10, .25, and .40, and d values of .20, .50, and .80 refer to small, medium, and large effect sizes, respectively (Cohen, 1992). Cohen’s d was used as a measure of effect size when two sample means were tested (Cohen, 1992). Cohen’s f was used for tests of more than two sample means such as main effects and interactions between two or more experimental factors (Cohen, 1992).

Manipulation Check—A manipulation check was performed to ensure that the positive and negative terms and images employed as message claims in the simulated ads were rated as such. This check involved the conduct of a mixed three-factor ANOVA. Message claim valence scores served as dependent measures for the analysis. Linguistic form of the health descriptor (affirmations, negations) served as the between-subjects factor, and message claim valence

¹Terms were chosen from the Bradley & Lang’s (1999) Affective Norms for English Words (ANEW) ratings database; Images #1111, 1710, 2900, 5830, 6300, 7250, 7502, and 9342 were selected from Lang et al.’s, (2001) International Affective Picture System database.

(positive, negative) and modality (terms, images) served as within-subject factors. As desired, a very large effect size of $f = 5.69$ was found for the main effect of valence, $F(1, 148) = 4,705.0$, $p < .01$, with the message claims intended to be negative in valence being rated more negatively ($M = 2.00$) than those intended to be positive ($M = 6.44$). The effects of linguistic form of the health descriptor, $F(1, 148) = 2.60$, $p > .10$, and the interactions between linguistic form of the health descriptor and valence, $F(1, 148) < 1$, and linguistic form of the health descriptor and modality, $F(1, 148) = 2.10$, $p > .10$, were non-significant, suggesting that the message valence manipulation was consistent across affirmative and negated health descriptors and across both modalities (as desired).

Knowledge Structure Formation—To test our hypothesis about learning differences (H1), a mixed four-factor ANOVA was conducted. Memory scores acted as the dependent variables for the analysis. Linguistic form of the health descriptor (affirmations, negations) served as the between-subjects factor, and health descriptor evaluative valence (positive, negative), message claim valence (positive, negative) and modality (terms, images) served as within-subject factors. Table 1 shows the results of the mixed ANOVA and Table 2 presents the cell means (in terms of percentages of correct responses). As predicted, a significant main effect for linguistic form of the health descriptor was observed, $F(148) = 4.92$, $p < .05$, with a small to medium effect size of $f = 0.18$. Inspection of the means underlying this result provides support for our hypothesis, with participants demonstrating greater ability to form linkages between message claims and health-related descriptors when the descriptors were presented as affirmations ($M = 50.3\% - 8.04$ correct out of 16 items) versus affixal negations ($M = 43.3\% - 6.92$ out of 16). As evidence of the robustness of this word form effect, the interactions between linguistic form of the health descriptor and health descriptor valence, message claim valence, and modality were all non-significant (see Table 1).

Discussion

Experiment results show that adolescent consumers had an easier time linking new associations to affirmative health-related descriptors (e.g. smoker) than to their linguistically negated counterparts (e.g., nonsmoker). Moreover, the result held for the creation of linkages with positive and negative terms and images across descriptor valence conditions (evaluatively positive and negative descriptors). This pattern of results indicates that the hypothesized linguistic negation effect is robust and potentially generalizable to a wide range of conditions.

Given that the health-related descriptors used in the advertisements remained on the screen for more than 25 seconds, and each message claim remained on the screen for 10 seconds, these results cannot be attributed to it simply taking longer to comprehend negations than affirmations (especially since it generally takes only about 1 second to judge the semantic content of words – cf., Chee et al., 1999). Moreover, given that participants were told to expect a memory test, these results cannot be explained by differential motivation to process affirmative versus negated descriptors. Rather, the affirmation advantage appears to be attributable to differences in the manner in which affirmations and negations are stored in long-term memory. Since affirmations tend to be stored as discrete nodes, they can be directly linked to terms and images. In contrast, since negations are likely to be stored as constituent nodes, the linkage of terms and images is necessarily indirect, involving connections between a negating affix, an affirmative root word, and the term or image.

Interestingly, no main effect was found for message valence suggesting that framing did not have an independent effect on the development of knowledge structures. However, as shown in Table 1, once linguistic form is accounted for, a two-way interaction between message valence and health descriptor valence, as well as a three-way interaction between message valence, health descriptor valence and message modality, seem to suggest a more complicated

role for message framing than has been found in the past. An examination of the means shown in Table 2 suggests that when the health descriptor is evaluatively positive (e.g., active, nonsmoker), positively framed messages are most effective ($M = 45.5\%$ versus 39.5% for positively and negatively framed messages respectively); when the health descriptor is evaluatively negative (e.g., smoker, inactive), negatively framed messages are most effective ($M = 56.3\%$ versus 45.8% for negatively and positively framed messages respectively). Evidence for the superiority of matching message valence and health descriptor valence is further indicated by the lack of impact modality has on knowledge structure development in the matched conditions. This suggests that the frequently observed facilitative effect of visual versus verbal information on processing is overshadowed by matching valence. The facilitative effect of visual information was only found to be critical in those conditions where message valence and health descriptor valence were not matched (see Table 2).

EXPERIMENT 2

Experiment 1 provides evidence that it is harder (easier) to learn associations with health-related word concepts when they are linguistic negations (affirmations). Experiment 2 utilizes a response time paradigm to assess the relative efficiency of retrieving pre-existing associations with affirmative and negated concepts. Specifically, participants are asked to make yes/no judgments about whether they associate a set of target words with affirmative and negated forms of familiar concepts. According to the associative network perspective, the process of retrieving associations with affirmations should involve direct activation of the affirmative word concept node, which should spread directly to associated nodes. In contrast, the process of retrieving associations with negations should be indirect, involving the activation of the constituent nodes comprising the negation, which should spread activation to associated nodes and then require some mental arithmetic to arrive at a set of computed associations. Thus, it should be more difficult (i.e., take longer) for participants to make association judgments for negated concept-target pairs than it does to make judgments about affirmation-target associations.

Methods

Participants—One-hundred and twenty-one undergraduate students participated in Experiment 2 for course credit. Respondents completed experimental protocols individually in sessions that included 4 to 12 participants. All participants were native speakers of English.

Design—The experiment employed a mixed-factorial design. Health-related word concept (smoking, drinking, health) and list order (1 = affirmation then negation, 2 = negation then affirmation) served as between-subjects factors. Linguistic word form (affirmation or negation) served as the lone within-subject factor. All participants were randomly assigned to word concept and list order conditions.

Procedure—A computer program was developed to administer study protocols and gather response time measures. The program informed participants that the experiment aimed to determine what associations they have with certain words. To complete the primary experimental task, respondents were told that a concept word would first appear in the top-center of the computer screen for several seconds and then a series of six target words would appear in a box located in the middle-center of the screen, one target at a time. Subjects were asked to respond to each target word by pressing the “y” key if they believed the target was associated with the concept and the “n” key if the target was not related to the concept. Given the location of these keys on the standard keyboards used in the study, participants generally chose to utilize their left index finger to press the “y” key and their right index finger to press the “n” key. To ensure that their response times provided a valid measure of processing efficiency,

respondents were instructed to respond as quickly as possible and told that there were no right or wrong answers. After completing the association judgment task for four concepts, subjects completed self-report measures of association strength for each of the target words in relation to their respective concept word as well as measures of familiarity with the concept words.

Stimul—Three stimulus lists were used. Each list consisted of 4 word concepts and 24 target words (i.e., 6 targets for each of the 4 word concepts). Two of the word concepts on each list were fillers (e.g., politician) and two were hypothesis-relevant. Filler word concepts were employed in the first and third trials of the target word association judgment task to allow for practice effects and to prevent carryover effects, respectively. Affirmative and negated forms of experimental word concepts appeared in the second and fourth trials. If the affirmative (negated) form of the experimental word concept appeared in the second trial, then the negated (affirmative) form of the same word concept appeared as the final concept word (e.g., if order = 1, then smoker appeared second and nonsmoker appeared fourth; if order = 2 then nonsmoker appeared second and smoker appeared fourth).

Two criteria drove the choice of experimental word concepts. First, to increase relevance to the social marketing domain, word concepts pertaining to health-related issues were desired. Second, in order to rule out the possibility that differences in familiarity across word form could account for any observed variations in the amount of time it took subjects to make association judgments, an equivalent level of familiarity across the affirmative and negated forms of each word concept was desired. To satisfy the social marketing-relevant and familiarity criteria, word concepts commonly used in social marketing campaigns were chosen (i.e., healthy/unhealthy, smoker/nonsmoker, drinker/nondrinker). Results from the experiment verify that participants held an equivalent level of familiarity with the affirmative and negated forms of these word concepts.

Three criteria governed the choice of target words for which yes/no concept association judgments were to be made. First, in order for the association judgment task to make sense, some of the target words needed to be associated with the concept, allowing for “y” responses, while others needed to be unrelated to the target word, allowing for “n” responses. Second, the number of items that would be judged as being associated with each concept needed to be roughly equivalent to avoid confounding judgment type (i.e., yes or no) with word concept form. Third, the level of concept-target association strength needed to be equivalent across word form conditions to provide a conceptually valid test of our hypothesis about the relative accessibility of associations with affirmative versus negated word concepts and avoid confounds. This third criterion needs further clarification.

The use of real, health-related words with pre-existing associations creates a unique situation given the focus of this experiment. On the one hand, from an experimental design standpoint, it is important to rule out the possibility that variations in response time are simply due to the choice of target stimuli. Clearly, the odds of obtaining support for the hypothesis could be improved by choosing target words that have higher pre-existing association strength with affirmative versus negated concepts. On the other hand, from a theoretical perspective, discrete versus constituent representation predicts that associations with affirmative word forms should be stronger than associations with negated concept words (due to direct versus indirect meaning storage).

Although this dilemma cannot be entirely resolved, two steps were taken in order to provide a valid test and reduce the likelihood that results are simply due to the specific choices of affirmative and negated word concept-target pairings. First, the perceived level of concept-target association strength was equated across concept word conditions. Using concept-target pairings that are rated as being subjectively equivalent in association strength across word form

conditions provides a theoretically appropriate, but conservative test of the theory (i.e., perceived equivalence removes some of the natural variation between linkages with affirmations and negations predicted by the model). Second, six target associations per form of each of three concepts were utilized to produce a total of 18 independent concept-target association judgment stimuli per linguistic word form. The use of such a large number of stimuli to represent the association strength between word forms and targets minimizes any idiosyncratic effects attributable to individual concept-target pairs and also enhances generalizability.

In order to achieve perceived equivalence in association strength, it was necessary to use different target words across word form conditions. Almost without exception, any target word that is likely to be strongly associated with an affirmation (e.g., “loud” might be highly associated with “drinker”) is very unlikely to be associated with the corresponding negation (e.g., “loud” is probably not associated with “nondrinker”). Extensive pretesting was conducted using measures of perceived association strength to determine the set of six target words to pair with each linguistic form of the concept words. An equivalent level of perceived association strength across the six target words and their corresponding affirmative and negated concept word was verified in the experiment. The target words for each word concept were: *Smoker*: dirty, college, unhealthy, stupid, social, wealthy; *Nonsmoker*: clean, smart, annoying, healthy, loser, judgmental; *Drinker*: sloppy, partier, loser, loud, outgoing, fun; *Non-drinker*: boring, healthy, rude, smart, responsible, dork; *Healthy*: young, strong, annoying, active, boring, obsessive; *Unhealthy*: fat, lazy, happy, exciting, carefree, weak.

Measures

The dependent variable of interest in this experiment is the amount of time needed to make association judgments. Faster (versus slower) judgments indicate stronger/direct (versus weaker/indirect) links in memory between a concept word and a target word. The computer program developed for this experiment recorded response latencies (i.e., the time elapsed from the appearance of the target until a “y” or “n” key press) to the millisecond.

Additional measures employed in the experiment include: type of judgment (“y” or “n”), word concept familiarity, and perceived association strength. Under some conditions, it takes longer to respond with a “no” than a “yes” when making judgments (Bamber, Herder & Tidd 1975); therefore, the type of judgment was recorded to control for this potential variability. Measures of word concept familiarity included two items employing seven-point response scales, ranging from “1 = never see in print” to “7 = very often see in print” and “1 = never hear in everyday conversation” to “7 = very often hear in everyday conversation,” respectively. Responses to the items were averaged ($r = .49, p < .01$) to form a composite index of word concept familiarity. Measures of perceived association strength between each word concept and its corresponding six target words also included two items employing seven-point response scales (i.e., how quickly does <target word> come to mind when thinking about <word concept>?, measured from “1 = does not come to mind at all” to “7 = comes to mind immediately”; how consistent is <target word> with <word concept>”, measured from “1 = not at all consistent” to “7 = totally consistent”). These two items were averaged ($r = .75, p < .01$) to create a composite index of perceived association strength for each concept-target pair.

Results

Word Concept Familiarity—Prior to analyzing response latencies, equivalent familiarity with the affirmative and negated forms of word concepts needed to be established. Differences in familiarity would suggest a discrepancy in the number of times the affirmative and negated concepts had been previously processed, which would represent a rival explanation for any observed differences in participants’ abilities to retrieve pre-existing associations from

memory. Results of a repeated-measures ANOVA on word concept familiarity showed no overall differences in respondents' familiarity with affirmative ($M = 5.13$) and negated forms of the word concepts ($M = 5.15$; $F_{(1,118)} < 1$). In addition, the word concept (smoking, drinking, health) by word form (affirmation, negation) interaction was non-significant ($F_{(1,118)} < 1$), suggesting that participants were equally familiar with the affirmative and negated forms of each concept.

Perceived Association Strength—Although discrete versus constituent representation predicts differences in response latencies due to underlying, objective differences in association strength, stimuli with equivalent levels of *perceived* association strength across word forms were desired (see prior discussion). Results of a repeated-measures ANOVA suggest that perceived equivalence was obtained. The main effect comparing perceived word concept-target association strength for affirmations ($M = 3.57$, $SD = .96$) versus negations ($M = 3.60$, $SD = .94$) was non-significant ($F_{(1,118)} < 1$). The interaction between word concept (healthy, smoker, drinker) and word form (affirmation, negation) was also non-significant ($F_{(1,118)} < 1$).

Response Latencies—The analysis of response latency measures began with the calculation of each participant's average reaction times for "yes" responses and for "no" responses to each form of the word concept. As is common in reaction time experiments, responses more than 2 standard deviations above or below the mean were eliminated prior to conducting the analysis (Pollatsek, Rayner, & Collins 1984). Further, response latencies were initially subject to a reciprocal transformation to reduce the impact of extremely slow latencies (see Fazio 1990). Results using this transformation yielded the exact same pattern of results as that with the raw latency data, and thus to facilitate clarity in presentation latencies are reported using the raw data. A repeated-measures ANOVA was then conducted with word form (affirmation, negation) and response type (yes, no) serving as within-subject factors and word concept (smoker/nonsmoker, drinker/nondrinker, healthy/unhealthy) and order (whether the affirmation came before or after the negation) as between-subjects factors. See Table 3 for the ANOVA results.

Results pertinent to H2 show a large effect size of $f = .46$ for the main effect of word form, $F_{(1,115)} = 24.71$, $p < .001$, and medium effect sizes for the two-way interactions between word form and word concept, $F_{(2,115)} = 3.44$, $p < .05$, and between word form and response type (yes/no), $F_{(1,115)} = 8.87$, $p < .01$, $f = .25$ and $.28$ respectively.

Consistent with H2, the word form main effect resulted from participants taking longer to make association judgments regarding negated word concepts ($M = 1,116$ ms.) than affirmative word concepts ($M = 1,015$ ms.). The significant interaction between word form and word concept was due to greater differences in reaction times between the concepts "healthy" and "unhealthy" relative to the other word concepts (smoker/nonsmoker and drinker/nondrinker). Importantly, the interaction was ordinal, and subsequent tests of simple effects supported our prediction. Specifically, a large effect size of $d = .90$ was found with reaction times being much slower when the association judgments were made regarding the negated ($M = 1,160$ ms.) versus affirmative ($M = 985$ ms.) form of the word healthy, $t_{(39)} = 5.31$, $p < .01$. Similarly, a small to medium effect size of $d = .28$ was found with the other two word concepts, again with reaction times being slower when association judgments were made regarding their negated ($M = 1093$ ms.) versus affirmative word forms ($M = 1029$; $t_{(80)} = 2.51$, $p < .01$).

Finally, examination of the pattern of means underlying the significant interaction between word form and response type suggests that the affirmation advantage was robust across yes and no responses, but became smaller when participants gave a "no" response as to whether a target word was associated with a given word concept. Specifically, there was an average difference of 143.4 ms. between affirmative ($M = 961.5$ ms) and negated ($M = 1104.9$ ms.)

word forms when a “yes” response was given, $t_{(121)} = 5.74$, $p < .01$, $d = .52$; compared to an average difference of 57.1 ms. between affirmative ($M = 1069.2$ ms.) and negated ($M = 1126.3$ ms.) word forms when a “no” response was given, $t_{(121)} = 2.24$, $p < .05$, $d = .20$. Importantly, the results for “yes” responses suggest that participants experienced greater difficulty in accessing their pre-existing associations with negated versus affirmative forms of the word concepts.

Taken together, these results provide considerable support for the H2 prediction that it is more difficult to retrieve pre-existing associations with linguistically negated versus affirmative word concepts. However, it is still possible to explain this result as an artifact of the target stimuli. While subjects rated the affirmative and negated word forms as being equivalent in terms of the perceived association strength with their respective targets, and the variability in these responses were virtually identical across word forms ($SD = .963$ vs. $.939$), this does not preclude the possibility that the target words paired with negated forms of word concepts might have been more difficult to judge than the targets that were paired with affirmations (i.e., the negated concept-target associations might have been more ambiguous on average, requiring more lengthy consideration than the affirmative concept-target associations). If this were the case, subjects would be slower to respond when the target word was a negation versus affirmation. For this reason a more conservative test was conducted. This analysis employed a restricted data set that included only those association judgments where the target was clearly related or clearly unrelated to the word concept. Specifically, targets where less than 80% of participants provided the same type of judgment (yes or no) were excluded from the analysis.

Applying the minimum 80% agreement criterion led to the inclusion of 11 target judgments for the affirmative word concepts and 9 targets for the negated concepts. The average agreement level was 91.8% for the affirmation-target association judgments (7 predominately agreeing with a “yes” response and 4 predominately with a “no” response) and 89.5% for the negation-target judgments (5 predominately agreeing with a “yes” response and 4 predominately agreeing with a “no” response). Results of a repeated-measures ANOVA replicate the main effect of word form, $F_{(1, 118)} = 12.60$, $p < .001$; $f = .32$, found using the full dataset, with a longer response time exhibited for negations ($M = 1,088$ ms.) versus affirmations ($M = 1,006$ ms.). However, the two interaction terms that were significant with the full dataset were found to be non-significant. Specifically, the interaction between word form and word concept ($F_{(2, 118)} = 2.35$, $p = .10$) and the interaction between word form and response type ($F_{(1, 118)} = 1.51$, $p > .20$) were non-significant. Neither finding is pertinent to H2.

Discussion

Experiment 2 demonstrates that the efficiency advantage observed in Experiment 1 for learning associations with affirmations as compared to negations generalizes to the process of retrieving associations from memory. Specifically, the experiment’s response latency data show that it takes less time to make target-concept association judgments for linguistically affirmative versus negated concepts, suggesting that meanings associated with affirmations (e.g., smoker) are accessed from memory more quickly than meanings associated with their negated counterparts (e.g., nonsmoker).

GENERAL DISCUSSION

Results from two experiments suggest that messages focusing on enactment (linguistic affirmations) are likely to be more efficient in shaping and activating pertinent beliefs than messages about non-enactment (affixal negations). These results also offer a possible explanation for the literature’s mixed results on message framing. In the contexts in which positive message framing has been found to be superior – e.g., breast cancer screening and organ donation – gains and benefits are associated with affirmative descriptors pertaining to

enactment (e.g., donor); therefore, positively framed messages should have been maximally efficient. In contrast, in the contexts in which negative message framing has been found to be superior – e.g., tobacco and drug use – costs and losses are associated with affirmative descriptors pertaining to enactment (e.g., smoker); therefore, negatively framed messages should have been maximally efficient. Thus, it appears that the involvement of enactment-related descriptors (i.e., linguistic affirmations, rather than negations) may represent a common denominator for superior message efficacy.

Implications and Further Research

The memory-based account of the superiority of messages focused on behavioral enactment versus non-enactment suggests that our results may pertain to any social marketing issue where the concern is consumption/enactment vs. non-consumption/non-enactment behaviors. For example, our findings suggest that in contexts like physical activity, condom use and recycling, negative messages about non-enactment will be inherently less efficient than positive messages about enactment. In contrast, in substance abuse-related contexts, the use of positive messages will be inherently less efficient than negative messages due to the negated linguistic form of the target, anchoring concepts denoting non-enactment.

One possible solution to the inefficiency problem is to utilize affirmative brand names to anchor associations with non-enactment concepts. A prominent example of this strategy is the American Legacy Foundation's "truth" campaign, which was intended to establish "truth" as an aspirational nonsmoking brand (Evans, Price, & Blahut, 2005). According to Evans et al. (2002, p.27), "teens' social images regarding smoking predict their smoking behavior, thus, changing their social images of smoking (e.g., promoting the appeal of *nonsmoking* as a way of achieving a desired personal image of independence or rebelliousness) appears to be a useful framework within which to understand intended campaign effects [*emphasis added*]." In other words, the basic idea underlying the campaign is to use "truth" as a container for positive lifestyle associations with nonsmoking. Evaluations of the campaign's effectiveness suggest that "truth" has affected social imagery about nonsmoking (Evans et al., 2004), achieved high brand equity among its target audience (Evans et al., 2002), and contributed to reduced rates of smoking initiation (Farrelly et al., 2005).

This example suggests that social marketers may need to develop new, affirmative behavioral descriptors to denote non-consumption/non-enactment. The plausibility of developing such terms is supported by the existence of linguistically affirmative descriptors that have semantically negated meanings (e.g., vegetarian, virgin) and the fact that new words are invented regularly to fill important gaps in our language (Metcalf, 2002). Moreover, the marketplace is full of made-up brand names that can be permanently established in memory with approximately five exposures (Salasoo et al., 1985), thereby providing a foundation for acquiring brand knowledge. Thus, it seems likely that social marketing messages aimed at demarketing products like cigarettes and alcoholic beverages and promoting behaviors like non-drug use and avoidance of unhealthy foods and unprotected sex would benefit from the development of new descriptors to denote non-enactment. The wealth of prior research regarding the development of new brand names should prove fruitful to any such undertaking. For example, findings from Lowrey, Shrum, and Dubitsky (2003) suggest that if new, linguistically affirmative descriptors were to be developed to denote non-enactment, marketers would need to pay careful attention to the phonology (i.e., vocal sound), orthography (i.e., spelling), and semantics (i.e., underlying meaning) associated with the new descriptors.

Throughout this article, primary consideration has been given to the relative efficiency with which social marketing messages can be expected to succeed in shaping consumers' associations with word concepts denoting the enactment or non-enactment of a given behavior, and the relative accessibility of these associations. Ultimately, though, social marketers will

gauge the success of their campaigns based on the extent to which they impact targeted behaviors. Therefore, it is important to consider whether the findings of our experiments have implications for proximal determinants of behavior such as attitudes and behavioral intentions. Although there is no direct empirical evidence to support the claim that the advantage we observed for enactment-related word concepts will extend to these variables, extant theorizing and research relating to the relationship between beliefs and behavior as well as attitude accessibility and behavior suggests that it may.

At a very basic level, our experiments examined the impact of linguistic word form on the creation and storage of beliefs, which are represented in memory as an object node (e.g., a social descriptor or behavior) and one or more association nodes representing adjectives or outcomes linked to the object node. Fishbein and Ajzen's (1975) Theory of Reasoned Action suggests that beliefs can be used as proxies for behavior. According to the theory, health behaviors are a function of beliefs, attitudes, subjective norms, and behavioral intentions. Specifically, an individual's beliefs about the positive and negative consequences of enacting (or not enacting) a behavior determine their attitudes toward the behavior, their behavioral intentions, and ultimately, their behaviors. In addition, an individual's beliefs about the normative proscriptions of specific others and their motivation to comply with those specific others jointly determine their subjective norm, which then affects their behavioral intentions, and ultimately, their behaviors. Thus, the Theory of Reasoned Action posits that beliefs exert a strong, albeit mediated, influence on health-related behaviors. Hence, to the extent that messages focusing on affirmative, enactment-related word concepts have a stronger impact on belief formation and accessibility than messages focusing on negated, non-enactment-related word concepts, they should also be more likely to influence attitudes and behavior. With this said, the Theory of Reasoned Action does assume the link between beliefs and behavior to be dependent upon a rather cognitive, effortful process. Evidence from the attitude accessibility literature suggests that word form may also impact behavior in a less effortful manner.

As discussed in the attitude accessibility literature (e.g., Fazio, 1990; Fazio, Powell & Williams, 1989; Fazio, Sanbonmatsu, Powell & Kardes, 1986) an attitude is in essence a set of evaluative information that is linked to an attitude object in memory. In other words, the mental structures comprising attitudes toward specific behaviors are analogous to those of beliefs in that evaluative nodes are linked to specific behavioral word concepts in memory. Further, the accessibility of a person's attitude toward a given behavior varies depending upon the strength of these linkages. It therefore follows that attitude accessibility should be affected by the same variables that affect the formation and strength of the linkages between adjectives or outcomes and word concepts denoting the enactment (or non-enactment) of a behavior. In combination with the results of the two experiments reported herein, this line of reasoning suggests that attitudes regarding behaviors denoted by affirmative, enactment-related word concepts should be more accessible than attitudes regarding behaviors denoted by negated, non-enactment-related word concepts. This is important because attitude accessibility is positively associated with behavioral intentions and behavior.

Attitudes are more likely to be consistent with behavior when attitudes are highly accessible (Herr & Fazio, 1993). Accessible attitudes facilitate the decision making process by allowing individuals to quickly access stored evaluations from memory rather than having to engage in the appraisal process on each encounter with the attitude object. Hence, it is thought that when under time pressure or when operating with limited cognitive resources, attitudes may guide behavior "by default" (Jones & Fazio, 2008). Further, highly accessible attitudes can be accessed automatically (Fazio et. al., 1986), thereby influencing people's appraisals of an attitude object and affecting approach/avoidance behaviors in a relatively impulsive manner (Jones & Fazio, 2008).

Conclusion

The conceptual framework and empirical evidence presented in this article suggest that messages aimed at affecting beliefs about the enactment of behaviors are likely to prove more efficient than messages aimed at affecting beliefs about non-enactment, regardless of the valence of the behavior, the valence of the message, or the modality of the message. As this advantage appears to result from differences in the way in which linguistic affirmations and negations are processed and stored in memory, we believe that coining new, linguistically affirmative terms to denote the non-enactment of behaviors may improve the efficiency of messages focusing on the benefits of avoiding negative behaviors or the costs associated with failing to enact positive behaviors. This possibility, as well as the determination of the extent to which the observed efficiency differences translate to attitudes and behaviors, should be examined in future research.

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Storyboard of Ad for “Smoker” Used in Study 1

Figure.
Storyboard of Ad for “Smoker” Used in Study 1

Table 1

ANOVA Results: Study 1

Main and interaction effect	F(1,148)	Cohen's <i>f</i>
Between-Subjects Effects		
Linguistic Form (Linguistic)	4.92 [*]	.18
Within-Subject Effects		
Health Descriptor Evaluative Valence (EVal)	18.98 [*]	.36
Message Modality (Modality)	84.05 [*]	.75
Message Valance (Valance)	.97	
EVal × Valance	13.81 [*]	.30
EVal × Modality	1.01	
EVal × Linguistic	1.75	
Linguistic × Valance	.05	
Linguistic × Modality	.49	
Valance × Modality	.09	
EVal × Valance × Modality	29.02 [*]	.44
Linguistic × EVal × Valance	.07	
Linguistic × EVal × Modality	.20	
Linguistic × EVal × Valance × Modality	.54	

*
p < .05.

Table 2

Cell Means: Study 1

	Linguistic Form of Health Descriptor	
	Affirmation	Negation
Health Descriptor Evaluatively Positive		
Positive Message		
Picture	53.9%	45.2%
Term	46.8%	36.1%
Negative Message		
Picture	58.4%	48.6%
Term	30.2%	20.9%
Health Descriptor Evaluatively Negative		
Positive Message		
Picture	56.4%	58.4%
Term	38.5%	29.9%
Negative Message		
Picture	62.2%	55.6%
Term	55.8%	51.4%

Table 3

ANOVA Results: Study 2

Main and interaction effect	F(1,115)	Cohen's <i>f</i>
Between-Subjects Effects		
Word Concept (Concept)	.10	
List Order (Order)	.89	
Concept × Order	1.09	
Within-Subject Effects		
Linguistic Word Form (Linguistic)	24.71 *	.46
Response- Yes, No (Y/N)	11.65 *	.32
Linguistic × Y/N	8.87 *	.28
Linguistic × Concept	3.44 *	.25
Linguistic × Order	.49	
Y/N × Concept	6.50 *	.34
Y/N × Order	3.70	
Linguistic × Y/N × Concept	.30	
Linguistic × Y/N × Order	.66	
Linguistic × Concept × Order	.81	
Y/N × Concept × Order	2.03	
Linguistic × Concept × Y/N × Order	.85	

*
p < .05.