

The Persuasion Effects and Mechanisms of Vivid Imagery Inducing
Strategies in Negative Health Messages: Exploring the Roles of
Motivation, Affect, and Message Substance

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Dedication

This dissertation is dedicated to my adviser, Professor Ronald Faber, and my dissertation committee, Professor Rohini Ahluwalia, Professor Jisu Huh, Professor Albert Tims, and Professor Daniel Wackman.

Abstract

This dissertation examines the persuasion processes and effects of affect-based mental imagery processing in the context of a negative health persuasion message. It aims at determining the qualifying conditions in which mental imagery affects persuasion in a negative message context. Through two controlled experiments, a particular emphasis is given to the influences of consumer prevention motivation, experienced negative affect, and the quality of message substance on message persuasion.

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The Persuasion Effects and Mechanisms of Vivid Imagery Inducing Strategies in Negative Health Messages: Exploring the Roles of Motivation, Affect, and Message Substance

PART I. Introduction

There is a long held belief in marketing communications that vivid messages are more persuasive than abstract messages. Advertisers and marketers strive to create vivid messages that can engage target audiences, enhance their attitudes, and change their behaviors. Vividness strategies are widely used in all sorts of marketing communications, be it traditional mass media advertising, or non-traditional online marketing messages.

Messages that employ vivid concrete description of users' experiences or life-like graphic presentation of the product features are commonly seen in today's marketplace. Some advertisers even directly invite consumer to imagine themselves in the consumption scenarios, believing that such vivid imagined experiences will help to create positive attitudes toward the product and encourage purchase behavior. For example, Mercury® automobile used such a tactic in their ad campaign, inviting consumers to "imagine yourself in a Mercury". These imagery strategies (such as vivid presentation, direct invitation to imagine, etc) are also commonly used in non-profit social marketing messages, to advocate for behavior changes, such as healthy eating, regular exercising, and getting medical checkups and tests.

Recently, consumer researchers have suggested that these message strategies can facilitate mental imagery processing (McInnis and Price, 1987). Mental imagery

processing is an information processing mode that involves “sensory representation of information in working memory”. For example, processing with mental images can involve concrete representation of ideas, feelings and memory through smell, taste, sight, and tactile sensations, or it can involve a single sensory dimension, such as sight (McInnis and Price, 1987).

Mental imagery processing is a cognitive mode that differs from the better known discursive processing, in which more language-like, semantic information is represented in working memory (Unnava and Burnkrant, 1991). Empirical research has demonstrated that imagery processing as evoked by message vividness strategy can increase consumers’ affective response and lead to more positive effects on message evaluation and behavioral intentions. At the same time, it decreases consumers’ effortful scrutinizing of message claims, and reduces their counter-arguing with the message (Bone and Ellen, 1992; Escalas, 2004).

These findings are mostly based on messages that involve positive experiential associations with the advocated objects such as a product, a service or a behavior. Little attention has been given to imagery strategies that try to induce negative images. These negative images often include the undesirable consequences of not using certain products (e.g., dental floss) or services (e.g. auto insurance), or not changing certain behaviors (e.g. eating too much junk food). To date, no empirical study has directly investigated whether imagery inducing strategies focusing on negative images persuade people in the same manner as those emphasizing positive associations. Further, little research has explored the

boundary conditions that qualify the effects of imagery processing of negative messages.

Such lack of attention to the effects of imagery strategies in the negative domain hinders the theoretical development of persuasion research in general, and applied research in public health communication, political advertising, and social marketing in particular. In these areas, negative (rather than positive) events and scenarios often dominate the persuasive message environment. For example, in promoting health care products, vivid imagery inducing strategies (such as vivid concrete descriptions) have been widely used to present negative health consequences (such as those of obesity, insomnia, or contracting certain disease) that can occur if the message advocated is not followed. The lack of attention to these areas prevents us from a more complete understanding of the effects and mechanisms of vivid imagery inducing message strategies in affecting persuasion. To address this issue, this dissertation investigates the persuasion mechanisms involving vivid imagery inducing strategies in negative preventive health messages.

This dissertation starts with a review of persuasion research concerning vivid imagery inducing message strategies in current marketing, advertising and consumer psychology literature. It then investigates the proposed affect-based mental imagery processing in the context of a negative health pamphlet regarding HPV (Human Papiloma Virus). Aiming at determining the qualifying conditions in which mental imagery affects persuasion in a negative message, this research focuses on the influence of consumer prevention motivation, experienced negative affect, and the quality of message substance on message persuasion. Results from two controlled

experiments designed to test these issues are reported. Finally, a discussion of the implications for both message vividness and mental imagery research and persuasive communication practice is presented.

PART II. Literature Review

Early Research on the “Vividness Effect”

Vividness message strategies have been commonly used in various forms of persuasive communications, such as advertising and social marketing messages. For a long time, vivid messages were thought of as having a greater persuasive impact on message receivers than pallid or abstract messages. This is commonly known as the “vividness effect” (Nisbett and Ross, 1980). In practice, communication professionals seem to share an unspoken belief that vivid (versus pallid or abstract) presentation of information is more effective in influencing consumers’ learning and evaluations. Over the past decades, interest in the “vividness effect” has generated much research in three different fields, psychology, communications, and education. Vivid message strategies have also been widely used in marketing communications, such as advertisements and social marketing messages (Aaker, 1975; Ogilvy, 1963). Despite the intuitive belief in the “vividness effect”, empirical research in this area seems to suggest that this is a far more complex issue.

Among the most influential early researchers in this area, Nisbett and Ross (1980) examined the question of why people’s inferences and behavior are more influenced by vivid, concrete information than by pallid and abstract propositions of substantially greater probative and evidential value. They argued that part of the reason for the greater inferential impact of vivid information on judgment is that

vivid information is more likely to be stored and remembered than pallid information is. Information that is easily remembered is by definition more likely to be retrieved at the time of judgment and decision-making.

Nisbett and Ross (1980) built a theoretical case for the advantages of vividly presented information in enhancing memory and persuasion. In their view, information is described as vivid if it is “1) emotionally interesting, 2) concrete and imagery-provoking, and 3) proximate in sensory, temporal, or spatial way” (Nisbett and Ross, 1980, p. 45). They proposed that vivid information is likely to attract and hold people’s attention and to excite the imagination. They pointed out that each of these 3 characteristics of vividness may make an independent contribution to the greater inferential impact of more concrete information. These factors are not usually independent in practice, even though they are conceptually distinct in theory.

Nisbett and Ross (1980) also suggested several mediating mechanisms that might underlie the “vividness effect”. These mechanisms include increased availability of vivid information in memory, greater attention to, and elaboration of, vividly presented information, and greater rehearsal of vivid material. Over the years, Nisbett and Ross’ (1980) effort in theorizing the “vividness effect” has been frequently cited, even though these propositions are largely based on anecdotal knowledge and casual observations.

Taylor and Thompson (1982) reviewed more than a dozen studies which operationalized “message vividness” in a number of different ways. They found that the widely spread belief of the “vividness effect” seem to be very elusive to

empirical researchers. Their review of these studies shows that concrete descriptions have no consistently greater impact on judgment than more pallid and dull ones. Pictorially illustrated information is no more persuasive than equivalent information unaccompanied by pictures. Videotaped information has no consistently greater impact on judgment than oral or written information. And personal contact is not inherently more persuasive than vicarious experience. The only type of vivid information that appears to have a significant impact on judgments is that presented in the form of case histories, which is subject to confounding alternative explanations (Taylor & Thompson, 1982).

Research addressing more limited versions of a vividness effect also remains inconclusive. Some evidence (e.g., Reyes, Thompson, & Bower, 1980) suggests that vividly presented information may be differentially impactful only after a delay. However, other studies have failed to find such an effect (e.g., Sheddler & Manis, 1986). Sheddler and Manis (1986) found significant effects of judgments immediately after message presentation. Their study used two-sided as opposed to one-sided communications, leading to the possibility that, with two-sided communications, vivid material may have a persuasive edge. However, other studies using two-sided communications (Reyes et al., 1980; Taylor & Thompson, 1982) have not found similar effects.

These conflicting findings complicate the theoretical issues involving the “vividness effects”, and have prompted researchers to explore potential qualifying factors that affect the persuasiveness of vivid information. For example, Taylor and Thompson (1982) propose that the persuasion effects of vivid information may be

evident only under conditions of differential attention. That is, vividly and non-vividly presented information may have an equal impact on judgment when there is sufficient processing opportunity. However, vivid material may compete more successfully for attention under conditions of distraction, and hence be more persuasive than non vivid information in this situation.

Taylor & Wood (1983) undertook several efforts to test the differential attention hypothesis. Their studies employed field-like settings in which individuals were exposed to radio messages presented either vividly or non-vividly under conditions of full or divided attention. None of the investigations provided any support for the hypothesis that vividly presented information competes more successfully than non-vivid information under conditions of divided attention. Shedler and Manis' (1986) study adopted a similar method and also failed to find support for this hypothesis. In addition, some research even demonstrated that the well acknowledged "availability heuristic" (Tversky and Kahneman, 1973) does not appear to mediate the "vividness effect" (Shedler and Manis, 1986).

Others contend that the "vividness effect" may occur because people inherently perceive vividly presented information as more persuasive and thus report their judgment and evaluation based on such a belief. Collins et al. (1988) suggest two possible sources of this illusory persuasion effect. First, vivid information has a consistently greater impact on memory than more pallid material. It may be that people remember vivid information better than non-vivid information. As a function of the superior memory trace, people may conclude that they have been persuaded when, in fact, they have not changed their real attitudes and

behavioral intentions. Second, vivid information is consistently perceived as colorful, graphic, attention-getting, and interesting. If interesting, attention-getting, and colorful communications are believed to be more inherently persuasive than pallid and dull presentations, then people may erroneously assume that they have been persuaded by such a presentation. Similarly, Collins et al. (1988) proposed that the “vividness effect” may just reflect one of the “naïve theories” that people have about their own and other’s susceptibilities to persuasive messages. Vivid material may have some other effect on a perceiver (i.e., enhanced recall or interest value) that is believed to be associated with, and thus assumed to produce, persuasion. This experience may then lead to a common theory of (and misplaced faith in) the “vividness effect”. In one study, Collins et al. (1988) demonstrated that the manipulation of vividness through the use of concrete and colorful language produced an effect on perceived general persuasion (“How persuasive do you think this message was?”), but not on perceived personal persuasion (“To what extent do you think your opinions on this issue were influenced by this message?”). Therefore, they concluded that even though research participants reported that they perceived the more vivid message as more persuasive, but in fact their attitudes and behavior remained unchanged.

Overall, contrary to the intuitive belief, empirical research suggests that there is no evidence for a consistent “vividness effect”. Information that is presented in concrete, colorful terms does not have a consistently greater persuasion impact on judgment compared to information presented in a more pallid and dull form. However, failure to support the existence of such an effect does not

necessarily provide sufficient reason to accept the non-existence of it. One reason might be that most of the early vividness research literature does not engage affect, and the few studies that do involve affect rarely measured it (Taylor and Wood, 1983). It is possible that vivid information is only persuasive when it produces affective responses. Such a speculation cannot be properly tested without the advancement of theories of affect and affect-based information processing of vivid messages.

The Cognitive Elaboration Perspectives

More recently, *Dual-coding theory* and the *availability-valence hypothesis* have been widely referred to in the advertising and consumer behavior literature to explain the persuasion effects that involve vividly presented messages (Bone and Ellen, 1992).

Dual-code theory posits that if information is encoded in both verbal and imagery codes rather than in a single code, the memorability of such information should be enhanced (Urnnava and Burnkrant, 1991). A considerable body of research has shown that the likelihood of information retrieval is directly related to the number of alternative retrieval routes in memory (Anderson and Reder, 1979). Unlike abstract information, vivid information is more easily encoded in both verbal and imagery terms, and thus it is more likely to be retrieved. While dual-code theory offers an explanation regarding recall and memory, it does not directly

address the impact of mental imagery on persuasion outcomes such as judgment and evaluation.

Beyond the effects on memory and learning, the availability-valence hypothesis suggests that the availability of vivid information in working memory can positively affect attitudes and judgments. This expectation is based on the premise that the vividness of information presented in a message affects the extent to which people will engage in favorable cognitive elaboration. Since vivid messages (such as colorful pictures and concrete descriptions) are rich in cues, processing these messages in working memory is likely to enhance the number of message-relevant associations. When a judgment is made, a substantial number of routes would be available by which message-relevant information could be retrieved. In contrast, relatively few associative pathways would be established in processing pallid information; hence, there would be few routes by which message-related information could be accessed.

Extending from the dual-code theory, the availability-valence hypothesis directly addresses the impact of message vividness on persuasion outcomes, particularly, judgment and evaluation. According to the availability-valence hypothesis, judgments depend on not only the availability of the information in memory but also the favorability of such information. Availability refers to the ease with which a certain piece of information can be accessed from memory. Favorability refers to the valence of this information (either positive or negative) in relation to the message advocacy. Kisielius and Sternthal (1986) propose that both

the availability and favorability of information influence the cognitive elaboration process people go through before forming judgment and evaluation.

The extent of cognitive elaboration is traditionally conceptualized as the number of associative pathways in memory that utilize a particular concept (Anderson and Bower, 1980; Nisbett and Ross, 1980). Subject to the capacity limitation of human memory, the greater the cognitive elaboration of a certain piece of information, the greater is its availability for rendering attitudinal judgments. Along this line of theorizing, the extent of cognitive elaboration can determine the availability of certain information. Although this notion of cognitive elaboration is useful in predicting when a treatment effect on judgment will be observed, it does not allow anticipation of the direction of the effect.

To address this issue, the availability-valence hypothesis brought to attention the relative favorability of information during cognitive elaboration as an important predictor of attitudinal judgment. The availability-valence hypothesis posits that vivid information evokes cognitive elaboration, and this elaboration may enhance, undermine, or have no effect on the persuasiveness of a message, depending on the favorableness of the specific information represented in working memory.

According to availability-valence hypothesis, the favorableness (or valence) of the available information is defined in relative terms. One piece of information is viewed as being more or less favorable in the rendering of a particular attitudinal judgment than some other piece of information. Given that memory capacity is limited (Calder, Insko, and Yandell, 1974; Murdock, 1962), a change in judgment can occur when information currently held in memory is augmented or supplanted

by information that is more or less favorable to the message advocated (Kisielius and Sternthal, 1984).

The availability-valence hypothesis suggests that vividness message manipulations can have a significant effect on attitudinal judgments. To the extent that vividly presented information can induce greater cognitive elaboration than pallidly presented information, message related associations will be more available in response to a vivid presentation. Whether processing such vivid information enhances, reduces, or does not affect the extent to which judgments are consistent with a message position, depends on the relative favorableness of the specific information represented in working memory. For example, if vividly presented information stimulates the elaboration of mental associations that are closely related to the information presented in the message, enhanced persuasion is expected. Thus the vivid information is expected to be more persuasive than pallid information, which limits such elaboration. However, vivid information can stimulate the elaboration of individuals' own idiosyncratic associations. These idiosyncratic thoughts are typically less favorable than the information contained in the message. If these thoughts occur as a result of cognitive elaboration, persuasion may be undermined.

It should be noticed that idiosyncratic associations are expected to be less favorable than the information in the ad, since the ad message is designed to maximize advocacy for the product (Kisielius and Sternthal, 1984, 1986). Given that limited resources are available for judgment, the idiosyncratic information generated in response to the message is likely to supplant the potentially more

favorable information presented in the ad. As a result, judgment is expected to be less favorable when excessive elaboration is employed to process the ad.

In a series of experiments, Kisielius and Sternthal (1984) used several thought induction methods (such as verbal description, pictorial analogs) to enhance cognitive elaboration. They found that a vivid messages can have both positive and negative impact on persuasion. Vividness alone cannot determine if the message will be more persuasive or not. The key in determining the message' persuasiveness is the favorableness of the thoughts generated in response to the vivid message. These findings provide empirical support to the availability-valence hypothesis.

Similarly, work from the perspective of *resource matching theory* supports the effects of cognitive elaboration on judgment and evaluation proposed in the availability-valence hypothesis. For example, Keller and Block (1997) found an inverted-U relationship between resource allocation and persuasion regarding vividly presented information. They demonstrated that when processing resources matched the elaboration demands of vivid information, persuasion effect was the highest. Either excessive or inadequate cognitive elaboration could undermine the potential influence of vivid information on persuasion. Idiosyncratic associations generated from excessive processing are typically not as favorable as message consistent information. Inadequate elaboration resulted in lack of comprehension of the message, and thus also undermined persuasion.

In addition, Peracchio and Meyers-Levy (1997) examined two specific ad execution characteristics that can influence resource demands. These are: 1) whether the ad copy is narrative or factual, and 2) whether the ad layout either

physically integrates or separates the ad picture and ad claims. Both of these characteristics are related to message vividness. Their results reveal that under high motivation, whether persuasion is heightened or undermined appears to depend on the extent to which the ad execution characteristics render the resources needed to process the ad equal to, in excess of, or inadequate compared with those that motivated viewers have available for processing the ad. However, under low motivation, the resource demands of the messages do not affect persuasion.

To sum up, the availability-valence hypothesis and resource-matching perspectives seem to provide consistent explanations to account for the mixed findings in vividness research. Built upon early theorizing (Nisbett and Ross, 1980), these views expand the mediation mechanism to both the availability of vivid information and the valence of thoughts evoked by vivid information. Furthermore, the concept of valence (or “favorability”) can vary as a function of characteristics of the vivid message, the processing situation, and the individual processor, thus allowing message vividness to either have positive, negative, or no effect on judgment and evaluation. These views all focus on the role of cognitive elaboration plays in mediating the impact of vivid messages on persuasion. However, despite the flexibility and parsimony of these views, none of the research directly examined valence (or favorability). This leaves the research on message vividness effect inconclusive, since without clearly measuring the valence of the information represented in working memory, it is still not possible to predict the direction of the persuasion effect. More importantly, most of the research in this line of inquiry

largely concerns cognitive processes. The emotional responses of message receivers remain unaddressed.

Affect-based Mental Imagery Processing

As psychologists become increasingly interested in the role of affect in persuasion, more recent research on vividness and persuasion has taken a broader view and embraced both cognitive and non-cognitive (such as affective and experiential) processes into account. In applied fields such as advertising and consumer behavior, theories of mental imagery, have been used to explain the persuasion impact of vivid messages. This stream of research is distinct from the previously discussed vividness research in that it focuses on the processing mechanism activated by the vivid presentations in a message or some other strategies (such as imagery instructions), rather than the message itself. Therefore, the change in persuasion outcomes (such as attitudes and behavior) is attributed to the processing mode, not the message features (such as message vividness). Vividly presented messages can evoke mental imagery processing, but message vividness is not assumed as a necessary nor sufficient condition for the involvement of mental imagery during processing. A number of other factors (such as the focal character of the message, the plausibility of the scenario, and an individual's ability to imagine) can also facilitate the use of imagery processing (Ellen and Bone, 1992).

Mental imagery is conceptualized as a processing mode that involves multi-sensory information in working memory (McInnis and Price, 1987). It is often used

in contrast with discursive processing. Consumer information processing research has traditionally focused on discursive information processing (Bettman, 1979; Greenwald 1968; Wright, 1974, 1980). Discursive processing involves abstract or symbolic representations in working memory, such as words and numbers. Discursive processing is often a language-like process, and it can encompass a broad range of strategies. Compensational choice strategies, counter-arguments, attributions, and formulations of choice rules are all illustrations of discursive information processing. In contrast, imagery processing is a conceptually distinct way of representing information, which is “very like picturing and very unlike describing” (Fordor, 1981). It is defined as a process by which sensory information is represented in working memory during information encoding, processing, and retrieving (McInnis and Price, 1987)

According to its definition, imagery processing is a processing mode, not a knowledge structure (e.g., a specific schema or script). The instantiation of a schema or script generates imagery, but imagery processing is not the schema or script per se. For example, as MacInnis and Price (1987) argue, two individuals may draw upon their own specific scripts of a “romantic evening” in imagining such an event. As long as the instantiation of such scripts involves multi-sensory representations in working memory, both of the two individuals could be said to engage in imagery processing. Further, information from schemas or scripts can also be processed in a discursive mode. Hence, imagery processing and discursive processing are two distinct mental mechanisms that people use to process information.

Imagery processing involves concrete sensory representation of ideas, feelings, and memories. And it permits a direct recovery of the past experiences from long term memory if such experiences are available (Yuillie and Catchpole, 1977). The evocation of imagery may be multi-sensory – involving images that incorporate experience from other senses (such as smell, taste, sight, and tactile sensations), or it may involve only a single sensory dimension (such as sight). The absence of these sensory dimensions of information in working memory makes discursive processes less concrete (more abstract) than imagery processes.

According to McInnis and Price (1987), imagery processing can be further classified along a continuum of elaboration. Mental imagery processing at the lower level of elaboration can be simple rehearsal of the vivid sensory or experience based information contained in a message. Mental imagery processing at the higher level of elaboration can involve very complicated mental activities, such as simulations of a future event, day-dreams, and fantasies. These forms of mental imagery processing all involve representation of sensory information.

To date, research on mental imagery at the low end of the elaboration continuum seems to predominantly focus on memory and learning. Researchers found that compared to non-imagery processing strategies (such as verbal rehearsal), using imagery can substantially enhance memory for paired associative learning, and has a positive effect on people's memory (Bower, 1970; Paivio, 1969, 1971; Yates, 1966). For example, Lutz and Lutz (1977) demonstrated that pictures used as imagery-eliciting stimuli in advertisements had a positive effect on memory of product-relevant information, when the brand name and product attributes were

unified by the images. Similarly, Childers and Houston (1984) found that the redundancy between pictorial and visual information in advertisements can produce a superior effect on recall of the advertisement, particularly when a “sensory” processing strategy (rather than a “verbal” processing strategy) was used. However, not much effort has been made to bridge the earlier research on message “vividness effect” with the effects of mental imagery processing on persuasion variables, such as attitudes and behavioral intentions. It seems that it could be useful to connect these two areas of literature, using a process oriented mental imagery approach to help tackle some of the problems unresolved in “vividness effect” research. For example, such work could help to determine when vivid messages can induce message receivers to use mental imagery during processing, and how this mode of processing can affect message judgment and evaluation. Thus instead of testing the immediate effect of message vividness on persuasion, researchers can refine their investigation by including mental imagery as an intermediate mechanism that qualifies the persuasion outcomes.

Unlike imagery research at low levels of the elaboration continuum, imagery processing research at higher levels of elaboration, predominantly focuses on persuasion outcome variables, such as attitude change, intentions and behaviors. Elaborated imagery can help people anticipate future situations, simulate alternatives to current problems, and thus change their attitudes and behaviors through altering people’s affective and emotional experiences (Klosers, 1983; Klinger, 1977).

Early research in the use of imagery in clinical settings shows that imagery processing is more effective than discursive processing in influencing people's behavioral intentions (Cautela and McCullough, 1978). It has been shown that elaborated imagery of a feared outcome is a major factor perpetuating phobias (intention to avoid an object). Moreover, imagery-based treatment strategies can successfully reverse these intentions (Bandura, 1982; Cautela and McCullough, 1978). The explanation of imagery's effect on behavioral intention is that it works like a form of "covert conditioning", suggesting that people approach (avoid) objects that they associate with positive (negative) rewards via imagery. Similarly, Staats and Lohr (1979) view imagery as a stimulus that can elicit approach (avoidance) responses. On the basis of several experiments, Lang (1977, 1979) concludes that intentions are affected only if there is an emotional reaction evoked by the imagined scenario. He argues that emotional reactions to imagined scenarios that include feared objects are highest when elaborated imagery is used.

Interest has also recently been shown for the applications of elaborated mental imagery in consumer research. Mental simulation is one of the important applications of highly elaborated imagery. Mental simulation can be defined as the cognitive construction of hypothetical scenarios (Taylor and Schneider, 1989). Mental simulation is regarded as elaborated imagery processing, since when simulating events, people frequently think about their own actual or potential behaviors. When mental simulation occurs, consumers can immerse themselves in hypothetical scenarios that advertisers suggest. This can increase consumers' affective experience, and thereby reduce consumers' cognitive resources for

substance based processing activities such as counter-arguing with message claims (Escalas, 2004).

The current literature on mental simulation in consumer research suggests that elaborated imagery processing can be further differentiated as anticipatory and retrospective imagery processing. Anticipatory imagery processing refers to self-referent mental simulation of future events, whereas retrospective imagery processing refers to memory retrieval based on actual past experiences (Krishnamurphy and Sujana, 1999). Considerable research has been done in recent years in autobiographical memory as a form of retrospective imagery processing. An autobiographical memory is a recollection of a particular episode from one's past. It is frequently experienced as reliving a prior experience (Baumgartner et al., 1992). Like in mental simulation of future events, these relived phenomenal experiences in autobiographical memory can bring on strong affective reactions and thus enhance persuasion effect (Brewer, 1986).

In consumer research, elaborated imagery often involves affect-laden consumption episodes or experiences. These influence people's affective responses, thus enhancing the desirability (or undesirability) of the positive (or negative) end state emphasized in the message. For example, advertisers might induce consumers to vividly imagine themselves enjoying a relaxing cruise with their family on the Caribbean Sea, in order to enhance their intentions to buy a vacation package. Persuasion occurs when consumers experience positive affects during such imaginal experiences, and feel a heightened desire to make it happen soon.

To address this affect based route to persuasion, *transportation theory* has been recently used to explain the role of affect in elaborated imagery processing. Green and Brock (2000) define transportation as “immersion into a text”, that is, the extent to which individuals become lost in a story or the vivid narrative of a scenario (Gerrig, 1994; Green and Brock, 2000, p. 702). It was proposed that transportation leads to persuasion through a reduction in negative cognitive responses, realism of experiences, and strong affective processes (Green and Brock, 2000).

In sum, empirical evidence in consumer research supports the notion that advertising encouraged imagery processing can enhance brand attitudes and evaluation through increased positive affect and reduced critical thoughts during the message processing. It is argued that this increased affective experience results in enhanced persuasion outcomes (such as more positive attitudes and intentions toward the advertised product) (Escalas, 2004).

The Evocation and Content of Mental Imagery

Mental imagery processing typically can be induced in a number of different ways. These include: 1) pictures, 2) vivid descriptions, 3) instructions to imagine, and 4) guided imagery (MacInnis and Price, 1987).

Pictures are well-established predictors of mental imagery (Bugelski, 1983; Finke, 1980; Pavio, 1971; Rossiter, 1982). Research has shown that visual information tends to be remembered better than verbal information (Alesandrini and

Sheikh, 1983; Childers and Houston, 1984; Lutz and Lutz, 1977; Paivio, 1971). As a vivid imagery eliciting strategy, pictures can induce imagery processing, but they should not be equated with imagery processing. Pictures can also induce discursive processing. Hence it is dangerous to confuse the visual mode of presentation with its representation in working memory (Rossiter and Percy, 1983).

Vivid descriptions can stimulate the generation of imagery as well (Paivio and Csapo, 1973; Paivio and Forth, 1970; Paivio, Yuille, and Madigan, 1968; Richardson, 1980). Research shows that ratings of the concreteness of words are highly related to their rated imagery value (Paivio, et al., 1968). Some research even shows that abstract words can be made to generate more imagery processing by instructing subjects to think of an imagery-based exemplar (Cartwright, Marks, and Durrett, 1978).

Instructions to imagine something have been used as another strategy to generate mental imagery. Marketing researchers (e.g., Mowen, 1980; Wright and Rip, 1980) have employed instructions to imagine in manipulating imagery processing, but found mixed results. Some studies reported negligible effects on learning and attitudes from this imagery manipulation. Other studies using an instruction to imagine manipulation have reported significant effects (Carroll, 1978; Gregory et al., 1982; Sherman et al., 1984). It is speculated that in an advertising context, instructions to imagine are less effective than are “high imagery visuals” in eliciting mental imagery, particularly in situations where little schematic knowledge exists (Rossiter, 1982; Wright and Rip, 1980) or where external stimulation interferes with the generation of imagery (Mowen, 1980). However, imagery

instructions may be an important manipulation strategy when consumers are allowed the time to generate vivid imagery, when cues are concrete (Paivio and Csapo, 1973; Richardson, 1983), when instructions focus on subjects' reactions to the image (Lang, 1979), and when consumers have sufficient knowledge to generate imagery about their likely reactions (Rethans and Hastak, 1981; Smith, Houston, and Childers, 1983).

Guided imagery is an imagery-eliciting technique that resembles imagery-based methods in clinical settings. Participants are first asked to relax and then practice developing vivid imagery scenarios. To facilitate imagery evocation, participants are given cues that are designed to guide their imagery. The process is typically repeated for several trials, and finally, subjects are asked to imagine the object that is the focus of the study. Wollman (1981) warns that the usefulness of this procedure may be confined to those who have vivid, controllable imagery. Demand characteristics may contaminate this procedure, which seems to prevent it from being widely used for research in fields such as marketing communications.

Besides these message execution strategies, the generation of mental imagery has been found to be qualified by specific message content factors. For example, the focal character of an imagined scene, either self-related or other-related, can affect the degree of imagery processing (Bone and Ellen, 1992). Self-related imagery was found to be easier to create than other-related imagery. Additionally, self-referencing messages were found to evoke images that are more vivid than other-referencing messages. It was argued that such effects occur because individuals can draw on the more developed self-related schemata in

generating mental imagery when they were asked to use themselves as the focal character in the imagined scenarios. Bone and Ellen (1992) found that the plausibility of an imagined scene also influences the degree of imagery evoked. Plausibility refers to the likelihood of the person's finding himself or herself in the imagined scene. It varies on a continuum, bounded at the lower end by the *mundane* and at the upper end by the *inconceivable*. Similar to the effect of self-relatedness of the focal character, imagined scenarios with high plausibility were found to evoke greater imagery than those with low plausibility.

Several other message content variables were also found to influence the persuasion outcome of imagery processing. Psychological research has demonstrated that certain types of mental imagery processing are particularly useful in helping individuals to reach the future they envision (Taylor, Pham, Rivkin, and Armor, 1998). For example, Taylor et al.'s (1998) research in mental simulation indicates that the most successful simulations focus on the process of reaching a goal rather than on the outcome of attaining a goal. Similarly, Escalas and Luce (2003) manipulated the focus of participants thoughts while viewing a print advertisement. They found that process-focused thoughts result in higher behavior intentions than outcome-focused thoughts when the advertisement arguments are strong. However, in the case of weak advertisement arguments, process-focused thoughts actually result in lower behavior intentions than thoughts focusing on the outcomes of product use. These findings suggest that process-focused imagery processing can increase the persuasive power of strong advertising claims, and make individuals more discerning consumers who do not form behavior intentions when

advertising claims are weak. In another study, Escalas and Luce (2004) found that process-focused thoughts under low to moderate involvement level, increase the influence of argument strength on behavior intentions. Such effect reverses when involvement level is high. These findings demonstrate that even though imagery is a processing mode rather than a specific knowledge structure, the information content involved in imagery processing can contribute to processing effects as well.

PART III. Study One – Research Questions

The review of the mental imagery literature shows that message evoked mental imagery processing can enhance persuasion outcomes, attitudes and behavioral intentions, through increasing message receivers' affective reactions. To date, research in this area predominantly involves positively focused messages. It has been shown that persuasion is enhanced through increased positive affect resulting from the use of mental imagery during message processing.

However, mental imagery in response to the presentation of undesirable scenarios seems to be largely ignored. This is not surprising given that many advertising and marketing communication messages aim at enhancing consumers' positive associations with the advertised brand. Nevertheless, it has to be recognized that a substantial amount of commercial marketing communication messages deal with undesirable situations, as many products and services are designed to prevent or remedy potential accidents or risks. These can range from physical risks like insurance policies and consumer safety products to those that overcome social risks like dandruff shampoo and cleansers. Social marketing messages frequently focus on the negative consequences of behaviors such as smoking, drug use, and drunk driving.

It is common for advertisers to use vividness appeals to induce consumers' mental imagery regarding such negative scenarios to achieve persuasion. Yet it is not clear if the findings generated from research on mental imagery in the positive domain can be directly applied to the negative domain as well. Therefore, the lack

of research in the negative realm hinders a complete understanding of the persuasion effects and processes of imagery processing. To address this issue, the research presented here focuses on testing the effects and processes of vivid imagery inducing strategies in the context of negative messages.

In the following sections, theories related to the message processors' motivation and goals that might influence the effect of message receivers' use of mental imagery in processing negative messages will be discussed. Then research questions and hypotheses derived from this literature will be proposed.

Regulatory Goals and Persuasion

Regulatory focus literature suggests that there are two distinct motivation systems (i.e., promotion and prevention) that govern people's behavioral strategies in pursuing their goals (Higgins, et al, 2001). Promotion regulatory focus can motivate individuals to achieve desired positive end-states, so that they will be more likely to use strategies to maximize gains and avoid non-gains. Thus promotion focused individuals are sensitive to the presence and absence of positive outcomes. They pursue their goals with eagerness, preferring strategies that ensure gains and avoid non-gains. On the other hand, prevention regulatory focus can make individuals be concerned with safety, security and responsibility, and focus more on avoiding undesired negative end-states. Thus prevention focused individuals are sensitive to the presence and absence of negative outcomes. They pursue their goals with vigilance, preferring strategies that avoid losses and achieve non-losses.

Because the two regulatory orientations service different needs, certain goal-pursuit strategies may support one orientation (resulting in “fit”) but disrupt the other (resulting in “non-fit”). An eager (or approach) strategy that focuses on advancement (to attain gains and avoid non-gains) would represent a fit for those with a promotion orientation but would be a non-fit for those with a prevention orientation. In contrast, a vigilant (or avoid) strategy that focuses on being careful (to avoid losses and maintain non-losses) would present a fit for those with a prevention orientation, but be a non-fit for those with a promotion orientation (Lee and Higgins, in press).

The research on regulatory focus and persuasion provides implications for the persuasiveness of vividly presented negative messages. For instance, the negative valence of the message can make prevention goals more salient (or accessible) and consequently impact how people process information to form judgment and evaluation. Pham and Avnet (2004) proposed that the salience of regulatory goals can affect the type of information people rely on to form their judgment. Through 4 studies, they demonstrated that both situationally primed and chronically possessed regulatory focus (promotion and prevention) can influence people’s reliance on either affective responses or substantive message information. Specifically, participants were more influenced by the strength of the ad claims when prevention goals were primed than when promotion goals were primed. This suggests that the more accessible prevention goals increase the reliance on an assessment of the substance of the message. Consistently, it was also showed that substantive assessments of the message were better predictors of brand evaluation

when prevention goals were primed than when promotion goals were primed. Pham and Avnet (2004) attributed these findings to a relative change in the perceived diagnosticity of the two types of information under accessible promotion versus prevention goals. That is, when prevention goals are salient, message substance is considered more diagnostic to judgment and evaluation, while when promotion goals are salient, affective responses is perceived more relevant to judgment and evaluation. The assessable promotion goals increase consumers' reliance on their subjective affective response to the ad (e.g., the perceived attractiveness of the ad's execution) and the decreases their reliance on the substance of the message (i.e., the perceived strength of the claims). On the other hand, the accessible prevention goals increase consumers' reliance on the substance of the message and decrease their reliance on their subjective affective response to the ad.

According to Pham and Avnet (2004), several lines of argument support these findings. First, the eagerness and risk-seeking accompanied with promotion goals should encourage the use of heuristics in general (Friedman and Forster 2000, 2001). To the extent that feelings are compelling evaluation heuristics (e.g., Pham 1998; Pham et al. 2001; Schwarz and Clore 1996, Slovic et al. 2002), eagerness and risk-seeing should also increase the reliance on subjective affective responses in persuasion. Second, promotion-induced eagerness has been shown to increase creativity (Friedman and Forster 2001). To the extent that subjective affective responses to the ad provide information that may go beyond stated attributes of the target, this increased creativity may promote the use of affect in persuasion. In addition, research in psychology also confirms these findings by showing that

messages with a negative focus are more compatible with audience' detailed processing of message content than messages with a positive focus. For example, Maheswaran and Meyers-Levy (1990) found that a negatively framed message was more effective than a positively framed message when consumers processing was focused on message content.

Therefore, negative messages can make prevention goals more salient to audience, and increase the reliance on message substance to form judgment and evaluation. On the other hand, vivid imagery inducing strategies seem to be effective when consumers do not base their judgment and evaluation on message substance, but on subjective affective responses to the messages (Escalas, 2004). This suggests that messages stressing the negative (or undesirable scenarios) could inhibit an audience from engaging in affect-based mental imagery processing, and thus reduce the effectiveness of vivid imagery inducing strategies.

Yet, in practice, a considerable amount of messages dealing with preventive health issues (such as smoking, hair loss, drugs, etc.) are employing imagery inducing strategies and stressing negative health consequences at the same time. Therefore, it is worthwhile to investigate the effectiveness of such strategies in the context of negative health messages, to advance our understanding of the boundary conditions that would allow such strategies to achieve their persuasion goals.

RQ1: Do vivid imagery inducing strategies facilitate persuasion in the context of negative messages?

Second, individuals' differences in chronic prevention focus may lead message receivers to process messages carrying a negative valence differently. It is well documented that consumers' goal orientations can have an important impact on how they process persuasive messages. Regulatory focus theory (Higgins, 1997, 1998) posits that people have different motivations (nurturance or security) that result from different needs. The fundamental nurturance needs include achievement, award and aspirations. The fundamental security needs include safety, security and responsibility. Research in the last decade has shown how people's fundamental needs for nurturance and security can influence their judgment and behavior (Lee and Higgins, in press, for a review). People with a salient nurturance need regulate their attention, perception, attitude, and behavior toward approaching gains and avoiding non-gains. They are thought of as promotion focused. On the other hand, people with a salient security need regulate their attention, perception, attitude, and behaviors toward avoiding losses and approaching non-losses. These people are referred to as prevention focused.

People are guided by their regulatory orientations in their goal pursuit activities. These orientations can be chronically stable, and reflect differences in cultural orientation (Lee, Aaker, & Gardner, 2000), childhood experience with caregivers (Higgins, 1998), or personal histories of success (Higgins, Friedman, et al., 2001). These orientations can also be situationally primed, as when people are prompted to think about their hopes and aspirations versus their duties and obligations (Freitas & Higgins, 2002).

Individuals who are more focused on avoiding undesirable consequences might react to these messages differently from those who are more focused on obtaining desirable outcomes. For example, individuals who are more focused on avoiding negative health problems related with smoking might process negative anti-smoking messages more attentively than individuals who are more interested in improving their general health condition and enjoying a higher quality life.

Research suggests that a highly accessible prevention focus can make individuals more attentive to message details, and more likely to base their judgment and evaluation on the perceived quality of message argument. On the other hand, a less accessible prevention focus will lead individuals to be more likely to use affect-based processing methods, and base their judgment and evaluation on their affective experiences during processing (Pham and Avnet, 2001). According to this view, when processing negative messages, individuals' chronic prevention focus may further amplify the substance based processing tendency of high prevention focused individuals, and make it more difficult for them to use affect-based imagery processing, thus further reducing the effectiveness of message vividness strategy. However, the recent regulatory fit literature seems to provide a competing account regarding how individual prevention focus might interact with message vividness strategy to influence persuasion.

The Influence of Regulatory Fit on persuasion

Research shows that regulatory fit affects people's cognitive processes and behaviors. When people experience regulatory fit, their goal pursuit activity feels right. They become more strongly engaged in whatever they are doing and develop more intense reactions to goal enabling (or disabling) objects (Higgins, 2000, 2005). In consumer research, it was found that when people's general reaction to a persuasive message or product is positive, the subjective experience of "feeling right" in the fluent processing that results from this fit can increase their willingness to pay more, enhance the favorability of their attitudes, and facilitate their brand choice probabilities. For example, recent research shows that people presented with health-related information that fits their regulatory focus perceive the information as easier to process and the arguments as more valid (Lee and Aaker, 2004). Additionally, regulatory fit has been found to make advocated causes more believable and more worthy of pursuit (Cesario, Grant, and Higgins, 2004). These findings suggest that the regulatory fit experience can increase perceived message persuasiveness and attitude towards the message advocacy (Cesario et al., 2004)

The current literature suggests that there are at least three ways in which regulatory fit may be experienced (Lee and Higgins, in press). First, people may experience regulatory fit when they employ goal pursuit strategies that fit their regulatory orientation. For example, Pham and Avnet (2004) demonstrated that, when making a decision, individuals with a promotion orientation rely on their subjective affective experience, whereas individuals with a prevention orientation

rely on reasons and message argument. Similarly, Avnet and Higgins (2006) asked research participants to choose between two brands of correction fluid either based on feelings or on reasons. Participants were then asked to indicate how much they would be willing to pay for the correction fluid. Avnet and Higgins found that promotion-oriented people who evaluated the correction fluid based on feelings were willing to pay 50% more for than those who evaluated the correction fluids based on reasons. Prevention-oriented participants were willing to pay almost 40% more for the product when they evaluate the product based on reasons than on feelings.

A second way in which regulatory fit may be effected is when people process information that fits (vs. disrupts) their regulatory orientations. For example, in a study that examines the effectiveness of antismoking campaigns among teenagers, Zhao and Pechmann (2007) first measured the chronic regulatory orientation of 1,200 ninth-graders, and then exposed them to one of four different 30-second antismoking advertising messages. Each ad depicted an indoor gathering of a group of young college students, and showed either a smoker lighting up a cigarette or a smoker putting out a cigarette. One ad emphasized gains by showing people give approving looks to a smoker after he put out the cigarette, and the smoker looked happy. Another ad emphasized nongains by showing people who stopped talking and smiling as a smoker lit up a cigarette, and the smoker looked sad when that happened. A third ad emphasized losses and showed people getting angry and giving disapproving looks to the smoker, while the smoker looked nervous. Finally, a fourth ad emphasized non-losses and showed people stopping

their disapproving looks as a smoker put out a cigarette, while the smoker looked relieved. They found that promotion-oriented teenagers were most persuaded to not smoke by the gain-framed ad. Prevention-oriented teenagers were most persuaded by the loss-framed ad. These results show that a gain (vs. non-gain) frame is more persuasive for those with a promotion orientation and a loss (vs. non-loss) frame is more persuasive for those with a prevention orientation.

A third way to achieve regulatory fit is through an operationalization within a message. This can render the message more persuasive, independent of the regulatory orientation of the message recipients (e.g., Cesario et al., 2004; Lee and Aaker, 2004). The idea is that a message advocating an end-state (either positive or negative) can be represented in the recipients' mind as a promotion or prevention goal. Regulatory fit (vs. non-fit) is effected when the message also prompts the recipient to think about fulfilling that goal using either eager or vigilant means. For example, Lee and Aaker (2004) presented participants with advertising messages that address either promotion or prevention concerns. The promotion message stressed that drinking the advertised grape juice could create more energy. The prevention message stated that drinking the advertised grape juice could prevent clogged arteries. They demonstrated that promotion messages are more persuasive when participants focus on gains (i.e., get energized) than on non-gains (i.e., miss out on getting energized). Their results also showed that prevention messages are more persuasive when they focus on losses (e.g, miss out on preventing clogged arteries) than on non-losses (e.g., prevent clogged arteries).

To sum up, these research findings with different operationalizations of regulatory fit suggest that regulatory fit is advantageous for the purpose of persuasion. When regulatory fit occurs, it can lead to enhanced message judgment and evaluation, through “feeling right” and “enhanced engagement” with the message.

The regulatory fit literature suggests that people’s prevention regulatory focus might moderate message processing and the subsequent judgments and evaluations from negative messages. Based on the regulatory fit literature, high prevention focused individuals have more accessible prevention focus than low prevention focused individuals. Therefore, they are considered to experience a higher level of regulatory fit with negative messages than low prevention focused people. Such high level of “fit” should render people feeling more fluent in processing and thus evaluate the message more positively (Higgins, 2000; Lee and Higgins, in press). In addition, high prevention focused individuals should be more motivated to engage with the message, and thus more likely to elaborate on vivid components of the message and use mental imagery to process the message than low prevention focused individuals. If the salient prevention goals activated by message focus facilitate people using substance-based processing, high prevention focused individuals should feel a higher level of regulatory fit, and this regulatory fit might further make them more likely to follow the vivid imagery inducing strategy and develop positive evaluations of the message. On the other hand, low prevention focused individuals should not feel as much regulatory fit as high prevention focused individuals. Thus they are not as likely to be receptive to imagery strategy,

or to use mental imagery, or incorporate affect-based input in their judgment and evaluation. This implies that in negative focused messages, vivid imagery inducing strategies might be more effective for individuals with a high prevention focus rather than a low prevention focus, due to the heightened level of regulatory fit, and the persuasion advantage it brings to high prevention focused individuals.

To sum up, the regulatory focus literature seems to offer two competing predictions regarding how individual prevention focus might moderate the effects of message vividness strategy on persuasion. One view suggests that in a negative message context where prevention goals are activated, individuals' chronic prevention focus further increases people's reliance on message substance, and reduces their reliance on affective experiences in judgment and evaluation. As a result, this would impede the intended persuasion effect of using a vivid imagery inducing strategy. Alternatively, the other view emphasizing the regulatory fit effect predicts that individuals' chronic prevention focus can form a synergy with the salient prevention goals that the negative message activated, and make message receivers experience a greater feeling of fluency during processing. This would increase their level of engagement with the message, and thus make it more likely that they would be influenced by the use of message vividness. This would facilitate the positive impact of message vividness on message evaluations. In order to explore these theoretical issues in the context of negative messages, the follow research questions are examined.

RQ2: Does chronic prevention focus moderate the impact of message vividness strategy on message persuasion?

RQ3: If so, how does this prevention focus moderate the impact of message vividness strategy on persuasion?

PART IV. Study One – Experiment

Review of literature on consumer mental imagery processing reveals that the effectiveness of vivid imagery inducing strategies has not been sufficiently investigated in the context of negative messages. Despite the intuitive belief in the effectiveness of imagery strategies, and the popular use of these strategies in marketing communications, it is not clear whether in the context of negative messages a vivid imagery inducing strategy will affect persuasion through inducing affect-based mental imagery processing. Therefore, the purpose of study one is to explore whether such intended effects will occur in the context of negative messages and what boundary conditions might facilitate these effects (RQ1). Study one also aims at examining the potential mediating influence of consumer chronic prevention orientation on their receptiveness to and judgment and evaluation of negative messages involving vivid imagery inducing strategies (RQ2). This moderation effect is examined by testing two competing predictions regarding how individual chronic prevention focus influences the impact of message vividness on perceived message persuasiveness (RQ3).

Design

A 2 (prevention focus: high vs. low) x 2 (message vividness: high vs. low) between subject factorial design was used. Subjects' individual chronic prevention focus was measured, while message vividness was manipulated. In the high

message vividness condition, vivid imagery inducing descriptions were used, while in the low message vividness condition, this strategy was not employed.

Subjects

Eighty-seven undergraduate students were recruited from introductory mass communication classes for this study. 37.9% of the subjects were male, 62.1% were female. The participants' age ranges from 16 to 25. The median age was 19.

Stimulus Messages

A public health pamphlet about HPV (“human papilloma virus”) was designed to mimic a pamphlet distributed by the American College Health Association. Two versions of the pamphlet were created. The high vividness version contains a personalized story about a young college couple who found out that they had contracted HPV. The low vividness version did not contain the personalized story. Instead, it included generic descriptions of how men and women generally react upon learning that they have contracted HPV (see Appendix 1 for a full copy of each story).

An excerpt from each version of the pamphlet is as follows:

Personalized version (High vividness):

“As soon as I got back to my dorm, I called my best friend, Liz. I was feeling pretty anxious and sort of panicky. How was I going to tell my

boyfriend, Jeff? Initially I was frightened about telling him anything, but I knew that I would want to know if the situation were reversed.”

Non-personalized version (Low vividness):

“A large percentage of women told us they felt anxious and panicky and needed to confide to a close woman friend. Most women are afraid to tell their boyfriends, but they realize they would want to know if the situation were reversed.”

Procedure

Upon arrival at the research lab, participants were asked to read the IRB consent form which briefly introduced the study and provided risk and benefit information. Then they were given a booklet which contained instructions, a background questionnaire, a test pamphlet and a response questionnaire. The general instructions participants read are as follows:

“You are about to participate in a study that investigates how people process different information tasks. In the booklet you receive, you will be asked to fill out a background questionnaire, read a message, and fill out a questionnaire that asks about your thoughts about the message and some background information. This study will take about 30 minutes to finish. Please return all materials to the researcher after you are done.”

The background questionnaire contained the Self Regulatory Focus Questionnaire (SRF) (Higgins et al., 2001). The test pamphlet included some general information about HPV and genital warts, and one of the two versions of the description of the typical consequences of, and people's reactions to, HPV and genital warts. The response questionnaire began with an open-ended question, asking subjects to write down in detail all thoughts and feelings that went through their minds while viewing the message. Following the open-ended question were measures of the key dependent variables and questions about potential confounding variables (such as age, gender, and sexual behavior). The Regulatory Focus Questionnaire (SRF, Higgins et al., 2001) was also included in the response questionnaire to allow for a test of the temporal stability of participants' regulatory focus.

The whole process took about 15-25 minutes for most participants. After finishing the research, all participants were thanked and debriefed. All participants were granted course credit in exchange of their participation.

Variables and Measurement

Message vividness. Perceived message vividness was measured by 11-items along 7-point scales. This measure has been successfully used in prior research on vividness (Dickson, 1982; Kiesielius and Sternthal, 1984; McGill and Anand, 1989; Rook, 1987; Block and Keller, 1997). Participants were asked to indicate how they would rate the message on the following dimensions: *vivid*, *personal*, *easy to understand*, *specific*, *representative*, *concrete*, *easy to imagine*,

easy to relate, important, detailed, and easy to picture. The response scale ranged from 1 “not at all”, to 7 “very much”. Cronbach’s alpha of these items was .87. An index of message vividness was created by averaging the scores on these items.

Self regulatory focus. Participants’ chronic regulatory focus was measured by the Self Regulatory Focus Questionnaire (SRF) which contains items for both prevention focus and promotion focus (Higgins et al., 2001). Separate indices for the promotion focus scale and the prevention focus scale were created. Reliability tests were run for both of these indices. The Cronbach’s alpha for the prevention scale was .71, and for the promotion focus scale, it was .69. The reliability of both scales appears to be lower than that reported in Higgins et al. (2001) (Cronbach’s alpha for prevention focus scale was .80; Cronbach’s alpha for promotion focus was .73 in that study). Since the reliability for the scales in this study both approach .70, the internal reliability of these scale was considered acceptable, although a little low. A median split was performed on the scores for each scale to classify participants into two groups. This led to classifying respondents as either high or low prevention focused individuals, and as high or low promotion focused individuals.

Message persuasiveness. Message persuasiveness was measured through 6 items assessed on 7-point scales. Participants were asked to provide responses to the following statements: “*how persuasive you think the pamphlet is*” (1 = “not very persuasive”, 7 = “very persuasive”), “*how likely you are to follow the recommendations in the future*” (1 = “not very likely”, 7 = “very likely”), “*how convincing the pamphlet is*” (1 = “not very convincing”, 7 = “very convincing”),

“the extent to which this pamphlet would influence you in future decisions” (1 = “no influence at all”, 7 = “influence a lot”), *“more likely than before to follow the recommendations and get an HPV test”* (1 = “strongly disagree”, 7 = “strongly agree”), and *“how interested you are in getting more information about HPV”* (1 = “not interested at all”, 7 = “very interested”). A test was run to determine the internal reliability of these items. It yielded a Cronbach’s alpha of .87. An index of message persuasiveness was created by averaging the scores on these 6 items.

Negative affect. The negative affect participants felt while viewing the pamphlet was measured through 12 common negative affective state items. These items were adapted from the Scale of Communication Evoked Feelings (Goodstein, Edell and Moore, 1990) (see Appendix 2). The items assessed were: *afraid, anxious, concerned, depressed, lonely, regretful, sad, tense, troubled, uncomfortable, uneasy, and worried*. Participants were asked to indicate the extent to which they experienced each of the negative feelings while reading the pamphlet. A score of 1 indicates they did not feel that feeling at all. A score of 7 means they experienced a lot of that feeling. Cronbach’s alpha for the 12 items was .94. A negative affect index was then created by averaging the scores on these items.

Affective arousal. Affective arousal of participants was measured through asking the degree to which respondents felt each of the two items, *aroused* and *stimulated*. Both items were measured along 7-point scales, with the anchors being 1= “not at all” and 7 = “very much”. A bivariate correlation test shows that the two items were positively correlated, $r = .61, p < .01$. The affective arousal index was formed by taking the average score of the responses on these 2 items.

Mental imagery. The extent of mental imagery processing was measured through 3 dimensions as suggested by Ellen and Bone (1991) (see Appendix 3). These 3 dimensions tap into different aspects of mental imagery processing. These dimensions are: 1) the quantity of mental images generated, 2) the ease of the generation of mental images, and 3) the vividness of mental images.

Measurement of the *quantity* of mental images generated came from responses to three items. These were: 1) “*as you read the descriptions in the pamphlet, to what extent did any images come to mind*” (1 = “to a very small extent”, 7 = “to a great extent”); 2) “*while reading the descriptions of the pamphlet, I experienced ...*”, (1 = “lots of images”, 7 = “few or no images”); and 3) “*all sorts of pictures, sounds, and or smells came to my mind while I read the descriptions in the pamphlet*” (1 = “strongly agree”, 7 = “strongly disagree”). Item 2 and 3 were reverse coded so that a higher score on these items indicates greater quality of mental images generated.

Measurement of the *ease* of mental imagery generation was based on responses to three questions. These questions were: 1) “*how difficult or easy were the images to create*” (1 = “extremely easy”, 7 = “extremely difficult”); 2) “*how quickly were the images aroused*” (1 = “very quickly”, 7 = “not quickly at all”); and 3) “*I had no difficulty imagining the scene in my head*” (1 = “strongly agree”, 7 = “strongly disagree”). All 3 of these items were reverse coded so that a higher score indicate greater ease of mental imagery generation.

The final dimension, the *vividness* of mental imagery, was measured by asking respondents to rate the mental images that occurred to them during viewing

the message on 11 different attributes. These attribute items were: *clear, pale, fuzzy, detailed, weak, vivid, intense, vague, lifelike, sharp, and well-defined*. A score of 1 indicated that the item did not describe their mental imagery at all, while a score of 7 indicated that it describes their mental imagery perfectly. Factor analysis showed that 4 items - *pale, fuzzy, weak, and vague*, did not load along with the rest of the items for the vividness of mental imagery. Therefore, these items were dropped in the following analysis.

A general index of *mental imagery* was created by averaging the scores on all the items used to assess all 3 dimensions. Cronbach's alpha of the resulting scale was .88. This scale of mental imagery indicates the extent to which individuals employ mental imagery during processing. Consisting of 3 important conceptual dimensions of mental imagery (i.e., quantity, ease, and vividness), this scale represents a comprehensive self-report measure to assess the degree to which respondents employ mental imagery during message processing (Ellen and Bone, 1991).

Imagery processing ability. Imagery processing ability has been shown to influence the extent to which people engage in mental imagery processing (MacInnis, 1987). In order to rule out potential confound effects, an individual's ability to use mental imagery to process information was measured. This was done using Bett's Questionnaire of Mental Imagery (QMI) (shortened version, Sheenan 1967, Appendix 4). This scale taps into 7 dimensions of an individual's ability to use mental imagery. These dimensions are *visual imagery, auditory imagery, cutaneous imagery, kinesthetic imagery, gustatory imagery, olfactory imagery, and*

organic imagery. Each of these dimensions includes 5 items assessing an individual's ability to construct mental imagery for a variety of objects and experiences. The reliability test of this scale showed that this scale has good internal reliability, Cronbach's alpha = .90.

Severity. Perceived severity of HPV infection was measured through 3 items. These were: 1) "*it is frightening to contract HPV*" (1 = "strongly disagree", 7 = "strongly agree"); 2) "*it is dangerous to contract HPV*" (1 = "strongly disagree", 7 = "strongly agree"); and 3) "*it is severe to contract HPV*" (1 = "strongly disagree", 7 = "strongly agree"). An index was created by averaging the scores on these items. Cronbach's alpha of this scale was .86. This variable was measured as a way to control for the potential confounding of perceived severity with the participants' evaluation of the message.

Efficacy. Efficacy has been documented in the health literature to influence the impact of persuasive health messages (e.g., Keller and Block, 1997). In this study, participants' perceived personal efficacy was measured by a single item on a 7-point scale, "*I am capable of doing all the recommendations mentioned in the pamphlet to prevent HPV infection*" (1 = "strongly disagree, 7 = "strongly agree"). This variable was measured to provide the opportunity to statistically control for any potential confounding effects.

Vulnerability. Perceived personal vulnerability to HPV was measured through 2 items: "*how vulnerable you think you are to HPV and genital warts*" (1 = "not vulnerable", 7 = "very vulnerable"), and "*how concerned you are about contracting HPV*" (1 = "not concerned", 7 = "very concerned"). A bivariate

correlation test showed that these two items are positively correlated, $r = .64$, $p < .01$. An index was created by averaging the scores on these items. Since different people may perceive themselves as either more vulnerable, or less vulnerable to HPV, this variable was measured to provide a closer look at any potential confounding influence.

Information amount. The amount of information provided through the pamphlet was measured by a single item 7-point scale, “*how would you assess the amount of information presented in this pamphlet*” (1 = “very little”, 7 = “a great amount”). The perceived information amount was measured here because the manipulated messages in this study were not exactly the same length. This item was thus included to assess and, if necessary, control for potential alternative explanations due to participants’ perception of the amount of information in the pamphlet they read.

Prior knowledge. Participants’ prior knowledge about HPV and genital warts was measured through 3 items. These items were: 1) “*I knew a lot about HPV*” (1 = “strongly disagree”, 7 = “strongly agree”); 2) “*I knew more than most people about HPV*” (1 = “strongly disagree”, 7 = “strongly agree”); and 3) “*I was very familiar with ways to prevent HPV*” (1 = “strongly disagree”, 7 = “strongly agree”). An index of prior knowledge was created by averaging scores on these items. Reliability of this index was .87. This variable was measured to rule out an alternative explanation that the extent of using mental imagery and persuasion outcome might be due to the differences in participants’ knowledge of and familiarity with the topic.

Results

This study was done to explore how message vividness strategy could positively affect persuasion in a negative message. It also investigated the potential moderating influence of individuals' chronic prevention focus on the persuasive impact of message vividness strategy. Based on the literature regarding the impact of prevention motivation on information processing (Pham and Avnet, 2004), it can be predicted that when confronted with negative imagery inducing messages, a prevention regulatory focus moderates the effectiveness of the message vividness on persuasion. Specifically, people with low (versus high) prevention focus will generate more mental imagery, experience more negative affect, and evaluate the message more positively when the message is high (versus low) in vividness. On the other hand, recent regulatory fit literature might suggest a different prediction regarding this moderation effect. Along this line of reasoning, when a higher regulatory fit is achieved (i.e., a high individual prevention focus and a negative message), message receivers should experience more positive feeling during message processing, thus engage more with the message, and be more persuaded by the message. This view predicts that high (versus low) prevention focused individuals should be more engaged and use more mental imagery, and be more persuaded by high vividness message than low vividness message. The results from study one addressing these research questions are reported below.

Randomization check. As a controlled experiment, this study relies on randomization to rule out non-manipulated factors that might confound the results.

One- way ANOVA tests comparing the two vividness conditions were performed on participants' gender, age, sex behavior, prior knowledge of HPV, perceived severity of HPV, perceived vulnerability to HPV, perceived efficacy, ability to use imagery processing and perceived information amount in the pamphlet. Results show that the participants in the two experimental groups are not significantly different on any these variables ($ps > .05$). Therefore, the randomization procedure appears to be effective in controlling these variables (see Table 1).

Manipulation check. An ANOVA test showed that the high and low vividness versions are significantly different from each other on the message vividness index, $F_{(1,86)} = 6.02$, $M_{high} = 4.87$, $M_{low} = 4.35$, $p < .05$. This indicates that the manipulation of message vividness was successful.

Self regulatory focus. The scores for both prevention focus and promotion focus were normally distributed. Subjects' responses to these scales were measured both before and after message exposure in order to test the temporal stability of individuals' regulatory focus. For pre- message exposure prevention focus scores (Figure 1), the minimum is 2.20, the maximum is 5.00, the mean is 3.56, and the standard deviation is .74. For post- message exposure prevention focus scores (Figure 2), the minimum is 1.60, the maximum 5.00, the mean is 3.54, the standard deviation is .78. For promotion focus scores prior to message exposure (Figure 3), the minimum score is 1.83, the maximum is 5.00, the mean is 3.79, the standard deviation is .59. For post-message exposure promotion focus scores (Figure 4), the minimum is 1.83, the maximum is 5.00, the mean is 3.74, the standard deviation is .62.

Participants' prevention focus scores at pre- and post- message exposure assessment were submitted to a paired sample t test to examine the temporal stability of regulatory focus. Results show that participants' prevention focus scores at pre- and post- message exposure assessment were not significantly different from each other, $t_{(1, 86)} = .65, p > .05$. In addition, the pre- and post- message scores are positively correlated, $r = .91, p < .01$.

To explore the temporal stability of promotion focus, paired sampled t test was also run on promotion focus scores at pre- and post- message exposure assessment. Even though this subscale does not directly influence the focus of this study, a pre- and post- paired sample t test was run as well to provide some information to look at any potential impact of message exposure on people's promotion focus. Results show that participants' chronic promotion focus did not changed significantly after message exposure, $t_{(1, 86)} = 1.79, p > .05$. The pre- and post- message scores are positively correlated, $r = .89, p < .01$. These results jointly show that individuals' chronic regulatory focus is a relative stable construct, and not altered by the message exposure in this experiment.

Further, the correlation between participants' prevention focus scores and promotion focus scores at pre-exposure assessment was found to be non-significant, $r = .04, p = .70$. Likewise, at post-exposure assessment, prevention and promotion scores were found to be uncorrelated, $r = .14, p = .19$. this result is consistent with the past literature on self regulatory focus in that individuals prevention and promotion foci indicating two distinct motivation systems, i.e., the prevention

system and the promotion system, and these two systems can be operating independent from each other (Higgins, et al., 2001).

RQ 1 results. Research question 1 examines the persuasion effect of vivid imagery inducing strategies in a negative message. A one-way ANOVA test was run to compare the subjects' responses on message persuasiveness. Results showed that no significant difference was found between the group which received the message involving vivid imagery inducing strategy (i.e. high message vividness) and the group which received the message not involving vivid imagery inducing strategy (i.e., low message vividness), $F < .01, p > .99$. This result suggests that the manipulation of vivid imagery inducing strategy did not make a significant impact on perceived persuasiveness of the message.

One-way ANOVAs on mental imagery and negative affect confirm the results on message persuasiveness, suggestion that there is no significant different between the impact on the extent of mental imagery used during processing ($F = 1.73, p = .19$) or experienced negative affect ($F = 1.73, p = .19$). These results suggest that the extent of subjects' mental imagery processing and the perceived persuasiveness of the message were not affected by the use of vivid imagery inducing strategy (in this case, message vividness). Furthermore, the results indicate that that the different message strategies did not alter the degree to which subjects experienced a negative affect. Thus, data suggest that the affect-based mental imagery processing did not occur in study one.

RQ 2 and RQ3 results. RQ2 and RQ3 test the possibility that individuals' prevention focus may have played a moderating role on the persuasion effect of

vivid message strategy in a negative message. In order to test the moderation effects of individual prevention focus, a regression analysis was run with message vividness strategy (high vs. low vividness) and individual prevention focus scores as independent variables on perceived message persuasiveness. Additionally, to test for a moderation effect, a vivid condition and prevention focus interaction term was included in the analysis.

The interaction of vivid condition and prevention focus on message persuasiveness was shown to be significant ($\beta = -1.29, p = .04$). This supports the moderation role of individual prevention focus on the persuasive impact of message vividness strategy, suggesting that individuals' chronic prevention focus significantly alters people's perceived message persuasiveness in high and low vividness conditions.

In addition, this regression test also showed a significant main effect of vividness strategy ($\beta = 1.08, p = .05$), and a marginal main effect of prevention focus ($\beta = .64, p = .06$). However, the main effects here should be viewed with great caution. This regression test was done to test the potential moderation effect of prevention focus. According to Baron and Kenny (1986), within a correlational analysis framework, a moderator is a third variable that affects the zero-order correlation between vividness condition and perceived persuasiveness (Figure 5). If we look at the zero-order correlation between vividness condition and perceived persuasiveness, this correlation is not significant, $r = .001, p = .99$. This result is highly consistent with that from the ANOVA results (as should be the case) and suggests that there is no real main effect here.

Baron and Kenny (1986) proposed 4 cases where a moderating relationship can be tested. In case 1, both the moderator and the independent variable are categorical variables; in case 2, the moderator is a categorical variable and the independent variable a continuous variable; in case 3, the moderator is a continuous variable and the independent variable is a categorical variable; and in case 4, both variables are continuous variables. The data here are an example of case 3 where the moderator is a continuous variable and the independent variable is a categorical variable. In this situation, Baron and Kenny state that, “the moderator hypothesis is supported if the interaction (path c) is significant. There may also be significant main effects for the predictor and the moderator (path a and b), but these are not directly relevant conceptually to testing the moderator hypothesis” (see Figure 5). Through the inclusion of the moderator (prevention focus) and the interaction term, the original zero-order relationship was changed. Since the purpose of using regression here was just to determine if the moderator caused the zero-order relationship to change or not, only this change should be considered in this analysis. The main effect for the ANOVA is likely to reflect the actual relationship between vividness condition and perceived vividness.

In order to further interpret the interaction effect (RQ2), a two-way ANOVA test was performed with (using a median split) prevention focus and vividness strategy on message persuasiveness. The results show a significant interaction effect of prevention focus and vividness condition, $F_{(1,86)} = 4.78, p = .03$ (see Figure 6 and Table 2). The observed interaction pattern shows a persuasion advantage of a high vividness message for people with low prevention focus ($M_{\text{low-vivid}} = 4.43$ vs.

$M_{\text{high-vivid}} = 4.95$). A high vividness message appears to be evaluated less positively than low vividness message for high prevention focused individuals ($M_{\text{low-vivid}} = 4.82$ vs. $M_{\text{high-vivid}} = 4.17$). However, split file tests by individuals chronic prevention focus show that for neither high or low prevention focused people, did the difference on perceived message persuasiveness of high or low vividness messages reach significance ($p > .1$). This suggests that even though the relationship between message vividness and perceived persuasiveness was significantly altered by individuals' chronic prevention focus in a statistical sense, such moderation did not reach the point where it makes difference in observable persuasion outcomes.

Taking together the results of study one, the main effects of vivid imagery inducing strategy on mental imagery, negative affect and persuasiveness were not significant, when comparing the two message conditions alone. This might suggest that the affect-laden mental imagery process did not occur. This shows why the “vividness effect” may have been so elusive in the early literature.

Overall, the results in study one showed no difference for high and low vividness messages in the extent of mental imagery processing, the experienced negative affect and the perceived message persuasiveness. The regression analysis on message persuasiveness revealed an interaction between message vividness and prevention focus. Thus, we speculate that the influence of prevention focus may serve to hide the impact of message vividness in this study. The results here seem to suggest that individuals' prevention focus can significantly alter the direction of how message vividness affects persuasion (Baron & Kenny, 1987). It appears that

for high prevention focused individuals, message vividness strategy slightly impeded persuasion, while for low prevention focused individuals, message vividness somewhat enhanced persuasion (Figure 6). Although these differences did not achieve significance, this result seems to be consistent with the prediction based on the empirical findings of the prevention motivation on information processing (Pham and Avnet, 2004). It was shown that in a negative message context, high chronic individual prevention focus seemed to reinforce substance-based processing. In this situation, affect-based processes (such a mental imagery) is not utilized in forming judgment and evaluation.

These findings contradict the predictions derived from the recent regulatory fit literature. Admittedly, the regulatory fit literature has not clearly specified the mechanism of how regulatory “fit” influences persuasion. For example, even though it has been proposed that a high level of regulatory “fit” will enhance message engagement, the type of the message content that people will be engaged with was not specified. It is not clear whether regulatory fit can enhance people’s engagement with message arguments or other non-argument related message elements, such as imagery inducing descriptions. The results in study one at least suggest that people’s engagement with mental imagery of negative health consequences did not differ across high and low vividness conditions.

To sum up, even though the results from study one seemed to be counter intuitive to the popular belief in vivid imagery strategies, these results are not completely surprising. Previous empirical literature consistently demonstrates that people tend to adopt substantive processing mode and base their judgment and

evaluation on the quality of message argument when processing negative information (Maheswaran and Meyers-Levy, 1990; Pham and Avnet, 2004). In this study, the key argument of the message was not varied, and the perceived argument strength was relatively high ($M = 5.19$). We suspect that subjects in this study were predominantly involved in substance-based processing. In this case, once the message provides relatively high quality arguments, judgment and evaluation will be reached without further utilizing any input from affect-based processes.

Since study one did not manipulated argument strength in the HPV pamphlet, further examination involving the variations of message substance (i.e., both strong and weak arguments) might help to further clarify these speculations. We expect that providing a condition where the negative health pamphlet uses relative weak arguments, will potentially allow the effect of affect-based processes (such as mental imagery processing) to affect persuasion outcomes. Detailed reasoning to support such speculations is discussed in the following section.

PART V. Study Two - Hypothesis Development

Message Substance and Affect

Message argument refers to the substance of a persuasive message as opposed to other message related factors (such as the execution characteristics of the message) and non-message related factors (such as message receivers' mood) (Petty and Cacioppo, 1986; Peracchio and Meyers-Levy, 1997). In vividness and imagery research, message substance and message vividness can be intertwined (for example, vivid descriptions of product attributes) (McGill and Anand, 1989).

Research shows that message evoked goal orientation can affect the type of information (either substance or non substance factors) that people use to form judgments and evaluations. Pham and Avnet (2004) argue that accessible regulatory goals (either chronically or temporarily accessible) determine the type of information people rely on to form judgments and evaluations. They found that in persuasion, the accessibility of "ideals" (promotion goals") increases consumers' reliance on their subjective affective responses to an ad relative to the substance or argument quality of the ad. In contrast, the accessibility of "oughts" (or "prevention goals") increases consumers' reliance on the substance of the message relative to their subjective affective responses to the message.

Negative focused messages can heighten prevention goals, by making needs such as safety and security more salient to the message receiver (Friedman and Forster, 2000, 2001; Lee and Higgins, in press). For example, if a message emphasizes the negative consequences of not using a product or adopting a behavior

(such as developing clogged arteries due to not eating right), the negative focus of the message itself can make prevention goals more salient to message receivers. In this case, negative message receivers should be expected to rely more on message substance to form judgments and evaluations than on subjective and affective information.

However, research in mental imagery shows that message vividness can enhance persuasion through increased affective experience resulting from the use of mental imagery during message processing (Lang, 1979; Green and Brock, 2000; Escalas, 2004). As suggested in most of the message vividness research involving positively focused messages, the valence of the message focus and message vividness strategy work together to enhance affect-based processing (e.g., Bone and Ellen, 1992). However, these two elements (i.e., message valence, and message vividness) could suggest two different routes of persuasion when the message is negatively focused. The negative message focus encourages substance-based processing. On the other hand, the message vividness is intended to induce affect-based processing.

It seems that message receivers are facing two alternative processing modes in processing negative focused vivid messages. The salience of prevention goals heightened by the negative focus of the message would lead message processors to rely on message argument to form judgment and evaluation. This predominant tendency of substance-based processing can impede the effectiveness of message vividness in inducing affect-based processes (such as mental imagery).

To understand how the two sources of information, substance and affect, can contribute to form judgment and evaluation, a closer look at two fundamental modes of information processing is needed.

Cognitive-experiential self-theory (CEST) identified the existence of two parallel, interacting modes of information processing: a rational system and an emotionally driven experiential system (Epstein, 1991). Consistent with this conceptualization, lots of evidence in everyday life suggests that people comprehend reality in two fundamentally different ways. One is variously labeled intuitive, automatic, natural, non-verbal, narrative, or experiential, while the other is analytical, deliberative, verbal or rational (Epstein, 1994). These different systems are sometimes referred to as the conflict between the heart and the head.

From the perspective of CEST, the two fundamental ways of knowing reflects the existence of two cognitive systems. The first is the *experiential system*, which is assumed to be intimately associated with affect (but not to the exclusion of all non-affective cognitions). The other corresponds to the *rational system*, which is assumed to be relatively affect-free. Epstein pointed out that the experiential system encodes experience in the form of concrete exemplars and narratives. It operates according to a set of inferential rules that different from those of a relatively affect-free, abstract, analytical, rational system. The two systems are assumed to operate in parallel and to interact with each other in processing information. They are not mutually exclusive, but reflect differentiated processing priorities for judgment and evaluation.

The Input of Affect in Substance Based Processing

Cognitive-experiential self theory provide a general framework to start examining the interplay between substance-based and affect-based processes in judgment and evaluation. Given that mental imagery is a processing mode that incorporates multi-sensory information in working memory, and often involves a direct recovery of experiential and affective responses (MacInnis and Price, 1987), imagery inducing strategies (such as message vividness) should be more likely to be effective when the processing environment favors the operation of the experiential system. However, the CEST does not specify the conditions where affect-based processing can influence cognition-based processing in forming judgments and evaluations.

To address the interplay between the two fundamental processing systems, research on the interaction between affect and cognition shows that under certain conditions, the affective information from the experiential processing system can exert influence on relatively cognition-based judgments and evaluations. Forgas (1994) conceptualizes this as “affect infusion”. He defines affect infusion as the process whereby affectively loaded information exerts an influence on and becomes incorporated into the judgmental process, entering into the judge’s deliberations and eventually coloring the judgment outcome.

Negative focused messages have been demonstrated to encourage substance-based processing (versus affect-based processing) (Maheswaran and Meyers-Levy, 1990; Pham and Avnet, 2004). Therefore, message receivers are expected to adopt

a substance-based processing strategy in forming judgment and evaluations. This might result in their primary use of message substance in arriving at judgments and evaluations. However, it is possible that when message substance does not result in sufficient judgment confidence, message receivers will incorporate the input from the affect-based processes and other non-substance based processes to form judgments and evaluations.

The Lay Epistemic theory (Kruglanski, 1980) suggests that the message processor not only processes but also validates the information before forming judgments. When such a validation process gives people confidence in their processing, judgment and evaluation is effected. When the validation process does not provide such confidence, more information must be taken in to form judgments.

This argument is consistent with the “sufficiency principle” advanced in the Heuristic-Systematic Model (Chaiken, 1987; Chaiken, Liberman, and Eagly, 1989). According to the sufficiency principle, message processors need to achieve a “sufficiency threshold” and reach a certain level of confidence to form judgments and evaluations. If the information processed does not make people feel they have reached the “sufficiency threshold”, processing will not end, and more information will be considered until such a “sufficiency threshold” is reached.

In the context of negative focused messages, it is speculated that the level of sufficiency can be altered through variations of message argument quality. As argued above, negative focused health messages tend to induce substantive processing. It is expected that when message substance (i.e., the specific argument used for message advocacy) is detailed and strong in quality, the processor will

reach an evaluation without the need to look into other sources of information. On the other hand, when the message substance is relatively less detailed and perceived to be weaker in quality, the processor is more likely to consider affective and experiential information in order to boost judgment confidence.

Therefore, it is speculated that affect-based mental imagery processing is qualified by perceived argument strength. Affect laden imagery processing is only effected when message arguments are perceived as weak and insufficient. When message arguments are strong and sufficient, affect-based processing of negative messages do not significantly affect judgment and evaluation.

Consequently, since negative affect is likely to be generated during mental imagery processing of negative scenarios, the strength of message argument should also qualify the message processors' affective reactions. Therefore, when argument is perceived weak in quality, a vivid message will generate more negative affect than a non-vivid message. On the other hand, when message argument is strong in quality, such differences in negative affect response will not occur. Similarly, persuasion through mental imagery should be effected only when message argument is weak and mental imagery is generated during processing. In this case, a vivid message should be more persuasive than a non-vivid message.

H1: The impact of message vividness on people's affect reactions to negative prevention health messages is contingent upon message argument. When argument quality is weak, a vivid message generates more negative affect than a non-vivid message. When argument quality is strong, vivid message and non-vivid message do not differ in influencing affective reactions.

H2: The effect of message vividness on message persuasiveness is contingent upon argument quality. When message argument is weak, vivid

message will be more persuasive than non-vivid message. When message argument is strong, vivid message and non-vivid message do not differ in influencing persuasion.

Furthermore, when the message environment allows for the integration of affect laden experiential information into judgment and evaluation, affective reactions to the negative message will be able to influence the judgment process. Therefore, it is expected that that when the message argument is weak, message vividness can influence persuasion through negative affect generated during processing.

H3: When message argument is weak, negative affect mediates the effects of message vividness on evaluation.

Last but not least, based partly on the results in study one, it is expected that significant interaction effect of individuals' prevention focus and message vividness on message persuasiveness should occur when message vividness affects perceived message persuasiveness. Therefore, a moderation test was conducted to further explore the moderating role of prevention focus on the persuasion effect of message vividness. This test is expected to provide more convincing results to understand how individuals' chronic prevention focus can qualify the persuasion results of high and low vividness messages.

H4: When message argument is weak, individuals' prevention focus moderates the effectiveness of message vividness in negative messages. Specifically, people with low (versus high) prevention focus will be more persuaded by messages with a vivid (versus non-vivid) message.

PART VI. Study Two - Experiment

Study two was designed to test the moderating influence of message argument on the effects of vividness in a negative message (H1, H2). Specifically, it is hypothesized that the impact of message vividness on people's affect reactions to negative prevention health messages is contingent upon message argument. When argument quality is weak, a vivid message generates more negative affect than a non-vivid message. When argument quality is strong, a vivid message and non-vivid message do not differ in influencing affective reactions (H1). The strength of message argument also qualifies the effect of message vividness on message persuasiveness. When the message argument is weak, a vivid message will be more persuasive than a non-vivid message. When message argument is strong, a vivid message and a non-vivid message do not differ in influencing persuasion (H2). In addition, it is hypothesized that message vividness strategy persuades through the mediation of negative affect when the message argument is weak (H3). Finally, hypotheses regarding the moderating influence of individuals' prevention focus were further tested in this study in the condition of both weak and strong arguments. It was expected that individuals' prevention focus moderates their experienced negative affect during processing and perceived persuasiveness of the negative message when message argument is weak as well as when it is strong (H4). A 2 (message vividness: high vs. low) x 2 (argument strength: strong vs. weak) between subject factorial design was used to test these hypotheses.

Subjects

One hundred and fifty-seven undergraduate students were recruited from an introductory mass communication class for this study. 31.8% of the participants were male, while 68.2% were female. The age range was between 16 and 30. The median age was 19.38.

Stimulus Messages

The public health pamphlet about HPV (“human papilloma virus”) used in study one was modified so that one version presented a relatively strong argument, and the other version presented a relatively weak argument. Crossing the two manipulated factors (i.e., message vividness and argument strength), four versions of the pamphlet were created. Like in study one, the high vividness version contained a personalized story about a young couple who found out that they had contracted HPV. The low vividness version did not contain the personalized story. Instead, the generic descriptions of how men and women typically react upon learning that they have contracted HPV that were used in study one were also used here (see Appendix 1).

Argument strength was manipulated in the last part of the health pamphlet where the goal was to persuade readers to follow the recommendations to prevent getting HPV or genital warts. The overall argument strength was manipulated in several ways: First, credibility of the information source was manipulated by using the Mayo Clinic (a well-known world class health institution) vs. the Brown Clinic (a

fictitious newly founded medical facility in Minneapolis, Minnesota). Second, the strong argument presented the recommendations based on solid research findings, while the weak argument presented the recommendations without providing any details regarding extensive research. Finally, the strong version claimed that the recommended HPV test procedure at the Mayo Clinic had an accuracy rate of 99%, while the weak version did not contain any information about the test accuracy at the Brown Clinic. These manipulations were used based on observation of the general persuasion strategies communication practitioners and researchers have been using to enhance message strength.

The strong argument version:

“The Mayo Clinic (Rochester, MN) has devoted a large amount of resources to the study of the detection, prevention and treatment of HPV. Over the past 7 years, the Mayo Clinic sponsored a series of studies involving 142,000 people aged 18-45, across the United States. These studies concluded that the most effective way to minimize the consequences of HPV is to get an HPV test at least once a year. The HPV testing procedure at the Mayo Clinic has an accuracy rate of 99%.”

The weak version:

“The Brown Clinic is a newly founded private clinic located in Minneapolis, MN. Last year, we began providing medical exams and services for the detection, prevention, and treatment of sexually transmitted disease, including HPV or genital

warts. *Our staff feel that getting an HPV test regularly is an effective way to minimize the consequences of HPV.*”

Procedure

Upon arrival at the research lab, participants were asked to read the IRB consent form which briefly introduces the study and information about the risks and benefits of participation in the study. Subjects were then given a booklet, which contained instructions, a test pamphlet and a response questionnaire. The test pamphlet was one of the four versions of the health pamphlet about HPV and genital warts. The response questionnaire began with an open-ended question, asking participants to write down in detail all thoughts and feelings that went through their minds while viewing the message. After that were questions concerning the key dependent variables. This was followed by the Self Regulatory Focus Questionnaire (SRF, Higgins et al., 2001). At the end, data on participants’ background information such as age, gender, and sexual behaviors were collected.

The instructions participants received are as follows:

“You are about to participate in a study that investigates how people process different health information. In the booklet you receive, you will be asked to read a message, and fill out a response questionnaire that asks about your feedback of the pamphlet and some background information. This study will take about 30 minutes. Please return all materials to the researcher at the end.”

Like in study one, the whole process took about 15-25 minutes for most participants. Upon finishing the questionnaire, all participants were thanked and debriefed. All participants were granted course credit in exchange for their participation.

Variables and Measurement

Message vividness. Like in study one, the vividness of the message was manipulated through the descriptions of how people typically react upon finding out they have HPV. 11 items were used to assess this variable. These include: *vivid, personal, easy to understand, specific, representative, concrete, easy to imagine, easy to relate, important, detailed, and easy to picture* (Block and Keller, 1997). Each item was rated on a 7-point scale ranging from 1 = “not at all” to 7 = “very much”. Cronbach’s alpha of for this index was .89. An index of perceived message vividness was then created by averaging the scores on these items.

Argument strength. Argument strength was measured through 5 items, each assessed on a 7-point scale. These items were: “*the clinic provides convincing reasons for their recommendations*” (1 = “strongly disagree”, 7 = “strongly agree”), “*the clinic’s recommendation of getting an HPV test is based on sound studies*” (1 = “strongly disagree”, 7 = “strongly agree”), “*the clinic is a credible organization to make such recommendation*” (1 = “strongly disagree”, 7 = “strongly agree”), “*the clinic provides believable evidence of the effectiveness of HPV testing*” (1 = “strongly disagree”, 7 = “strongly agree”), and “*the clinic provides strong argument*”

for their recommendation about HPV testing” (1 = “strongly disagree”, 7 = “strongly agree”). An index of argument strength was created by averaging the scores on these items. Cronbach’s alpha for these 5 items was .87.

Self regulatory focus. Participants’ chronic self regulatory focus was measured by the Self Regulatory Focus Questionnaire (SRF, Higgins et al., 2001). Indices for both promotion and prevention scales were created (Prevention focus: Cronbach’s alpha = .80; Promotion focus: Cronbach’s alpha = .67). In this study, the reliability for the prevention focus scale was equal to that reported by Higgins et al. (2001) in their initial study. However, as in the first study reported here, the reliability of the promotion focus scale was lower than that that reported in Higgins et al. (2001) study. Since the focus of this research was not on the influence of individuals’ promotion motivations (its inclusion here was for control purposes only), this lower reliability of the promotion focus scale does not seem to pose a serious threat to the results reported in this study. However, it does suggest that caution needs to be observed in future work that may more directly examine promotion focus or use both promotion and prevention scales to make predictions. As in study one, a median split was performed on both scales to classify participants into two groups. This yielded high vs. low promotion focus, and high vs. low prevention focus, groups.

Persuasiveness. Message persuasiveness was measured through 6 items assessed on 7-point scales. Participants were asked to provide responses to the follow statements: “*how persuasive you think the pamphlet is*” (1 = “not very persuasive”, 7 = “very persuasive”), “*how likely you are to follow the*

recommendations in the future” (1 = “not very likely”, 7 = “very likely”), “*how convincing the pamphlet is*” (1 = “not very convincing”, 7 = “very convincing”), “*the extent to which this pamphlet would influence you in future decisions*” (1 = “won’t influence at all”, 7 = “influence a lot”), “*more likely than before to follow the recommendations and get an HPV test*” (1 = “strongly disagree”, 7 = “strongly agree”), and “*how interested you are in getting more information about HPV*” (1 = “not interested at all”, 7 = “very interested”). A reliability test was run to determine the internal reliability of these items. The results yielded a Cronbach’s alpha of .81. Thus, an index of message persuasiveness was created by averaging the scores on the 6 items.

Negative affect. Participants’ negative affective experience was measured through assessing 12 common negative affective states adopted from the Scale of Communication Evoked Feelings (Goodstein, Edell and Moore, 1990) (See Appendix 2). These items were: *afraid, anxious, concerned, depressed, lonely, regretful, sad, tense, troubled, uncomfortable, uneasy, and worried*. Participants were asked to indicate the extent they experienced each of the negative feelings while reading the pamphlet. A score of 1 indicates they did not feel that feeling at all. A score of 7 means they experienced that feeling a lot. An index of negative affect was created by averaging scores on these items. Cronbach’s alpha of the 12 items in the negative affect scale was .95.

Affective arousal. Participant’s affective arousal level was measured through two items that asked how *aroused* and *stimulated* the participants felt. Both items are based on 7-point scales, with two anchors (1 = “not at all”, 7 = “very

much”). A bivariate correlation test showed that the two items of affective arousal were positively correlated, $r = .69, p < .01$. An affective arousal index was created by averaging the scores on these 2 items. This variable was measured to control for any potential confounding from arousal level.

Mental imagery. Mental imagery processing was measured through 3 dimensions as suggested by Ellen and Bone (1991) (Appendix 3). These 3 dimensions tap into three different aspects of mental imagery (i.e., the quantity of images generated, the ease of generating these images, and the vividness of the mental images).

The *quantity* of images generated was measured by the following items: “*as you read the descriptions in the pamphlet, to what extent did any images come to mind*” (1 = “to a very small extent”, 7 = “to a great extent”), “*while reading the descriptions of the pamphlet, I experienced ...*”, (1 = “lots of images”, 7 = “few or no images”), “*all sorts of pictures, sounds, and or smells came to my mind while I read the descriptions in the pamphlet*” (1 = “strongly agree”, 7 = “strongly disagree”). These items were reverse coded. Cronbach’s alpha of these items was .74.

The *ease* of mental imagery was measured by asking “*how difficult or easy were the images to create*” (1 = “extremely easy”, 7 = “extremely difficult”), “*how quickly were the images aroused*” (1 = “very quickly”, 7 = “not quickly at all”), and “*I had no difficulty imagining the scene in my head*” (1 = “strongly agree”, 7 = “strongly disagree”). These items were reverse coded. Cronbach’s alpha of these items was .90.

The *vividness* of mental imagery was measured by asking respondents to rate their imagery on 11 attributes. These were: *clear, pale, fuzzy, detailed, weak, vivid, intense, vague, lifelike, sharp, and well-defined*. A score of 1 indicates the item does not describe their mental imagery at all, and a score of 7 indicates it describes their imagery perfectly. Like in study one, a factor analysis showed that 4 of these items (*pale, fuzzy, weak, and vague*) did not go along with the rest of the items for the vividness of mental imagery. Therefore, they were dropped in the following analysis. Cronbach's alpha of the remaining 7 items was .91.

A general index of *mental imagery* was created by averaging the scores on all the items forming the 3 dimensions. Cronbach's alpha of the resulting scale was .93.

Imagery processing ability. Imagery processing ability has been shown to influence the extent to which people engage in mental imagery processing (MacInnis, 1987). In order to rule out any potential confound effects due to ability differences, individuals' ability to use mental imagery was measured by Bett's Questionnaire of Mental Imagery (QMI) (shortened version, Sheenan 1967, see Appendix 4). This scale taps into 7 dimensions of mental imagery. These dimensions are *visual imagery, auditory imagery, cutaneous imagery, kinesthetic imagery, gustatory imagery, olfactory imagery, and organic imagery*. Each of these dimensions includes 5 items assessing individual's ability to construct mental imagery for a variety of objects and experiences. The reliability test of this scale shows that this scale has high internal reliability (Cronbach's alpha = .92). An

index of imagery processing ability was created by averaging the scores on these items.

Severity. Perceived severity of HPV infection was measured through 3 items: “*it is frightening to contract HPV*” (1 = “strongly disagree”, 7 = “strongly agree”), “*it is dangerous to contract HPV*” (1 = “strongly disagree”, 7 = “strongly agree”), “*it is severe to contract HPV*” (1 = “strongly disagree”, 7 = “strongly agree”). An index was created by averaging the scores of these items. Cronbach’s alpha of this scale is .87. This variable was measured as a way to control for any potential confound due to the effect of fear or risk on message evaluation.

Efficacy. Efficacy has been documented to influence the persuasiveness of messages in the health communication literature (e.g., Keller and Block, 1997). Perceived efficacy was measured by a single item on a 7-point scale “*I am capable of doing all the recommendations mentioned in the pamphlet to prevent HPV infection*” (1 = “strongly disagree”, 7 = “strongly agree”). This variable was measured to provide an opportunity to control for any potential confound.

Vulnerability. Perceived vulnerability was measured through 2 items: “*how vulnerable you think you are to HPV and genital warts*” (1 = “not vulnerable”, 7 = “very vulnerable”), “*how concerned you are about contracting HPV*” (1 = “not concerned”, 7 = “very concerned”). A bivariate correlation test showed that these 2 items were positively correlated, $r = .67, p < .01$. People with different personal backgrounds may perceive themselves as either more or less vulnerable to HPV. This individual difference could result in potential confound effects in processing

the information given in the HPV pamphlet. Measuring this variable provided a way to control for the potential confound effect of perceived vulnerability.

Information amount. The amount of information provided through the pamphlet was measured by a single item rated along a 7-point scale. This item asked “*how would you assess the amount of information presented in this pamphlet*” (1 = “very little”, 7 = “a great amount”). This was done to control the potential alternative explanation that any observed effect was caused by differences in the perceived amount of the information provided in the pamphlet.

Prior knowledge. Participants’ perceived prior knowledge about HPV and genital warts was measured through 3 items: “*I knew a lot about HPV*” (1 = “strongly disagree”, 7 = “strongly agree”), “*I knew more than most people about HPV*” (1 = “strongly disagree”, 7 = “strongly agree”), “*I was very familiar with ways to prevent HPV*” (1 = “strongly disagree”, 7 = “strongly agree”). An index of perceived prior knowledge was created by averaging scores on these items. Cronbach’s alpha of this scale is .85. This variable was measured in order to be able to control for any confounding influence of participants perceived knowledge and familiarity with the health topic.

Results

Study two was conducted to test the impact of the argument strength of a negative message on the negative affect that participants generated during mental imagery processing (H1), as well as if argument strength affects the persuasiveness

of a negative vivid message (H2). It was also designed to test the hypothesized mediation role of experienced negative affect on the persuasion outcomes of a negative vivid message (H3). Based on the results in study one, this study further tested the possible moderating effect of individual prevention focus on the effectiveness of message vividness when mental imagery was used in processing (H4). The results of data analyses regarding these hypotheses are reported below.

Manipulation checks. In order to make sure the manipulation of two independent variables, message vividness and argument strength, achieved their desired goal, manipulation checks were performed. As in study one, a one-way ANOVA test showed that the high and low vividness versions of the message were significantly different from each other, $F_{(1,156)} = 35, p < .05, M_{high} = 5.20, M_{low} = 4.32$. Thus, the manipulation of message vividness appears to be successful.

In addition, a one-way ANOVA test showed that the strong and weak versions of the arguments were significantly different from each other, $F_{(1, 156)} = 10.81, p < .05, M_{strong} = 5.59, M_{weak} = 4.99$. Therefore, the manipulation of message argument strength also appears to have been successful.

Self regulatory focus. Like in study one, participants' prevention focus scores appear to have a normal distribution (Figure 7), with a minimum score of 1.40, a maximum score of 5.00, and a mean score of 3.41. Participants' promotion focus scores also appear to have a normal distribution (Figure 8), with a minimum score of 2.17, a maximum score of 5.00, and a mean score of 3.75. Unlike in study one, the promotion and prevention scores in this study were positively correlated, r

= .24, $p < .01$. This suggests the need to statistically control promotion focus in the analyses that test the impact of prevention focus.

Randomization check. As a controlled experiment, this study relies on randomization to rule out non-manipulated factors that might confound the results. Two way ANOVAs crossing the 2 manipulated variables (i.e., message vividness and argument strength) were performed on participants' gender, age, sex behavior, prior knowledge of HPV, perceived severity of HPV, perceived vulnerability to HPV, perceived efficacy, ability to use imagery processing, and perceived information amount of the message. Results show that the participants in the 4 experimental conditions are not significantly different on these variables ($ps > .05$). Therefore, randomization appears to be effectively controlling these variables.

Moderation role of message argument. In order to test whether argument strength qualifies the effects of vividness strategy on the negative affect experienced by participants (H1), a two-way ANOVA with message vividness and argument strength as independent variables and negative affect as dependent variable was conducted. A significant interaction effect would suggest that the strength of the message argument qualified the impact of message vividness strategy on participants' negative affect reactions during message processing.

Results show that the main effect of message vividness was significant, $F_{(1,156)} = 8.50, p < .01, M_{high-vivid} = 2.96, M_{low-vivid} = 2.36$. This suggests that the high vividness message generates more negative affect than the low vividness message. The main effect of argument strength was not significant, $F_{(1,155)} = 1.49, p = .22$. The interaction between message vividness and argument strength was significant,

$F_{(1,155)} = 6.30, p = .01$ (see Table 3 and Figure 9). This supports the expectation that argument strength qualifies the impact of message vividness on people's negative affect reactions. In addition, a two-way ANOVA test on affective arousal was run to test if participants' affective arousal level was affected by the manipulations. This analysis did not find any significant main effects or interaction ($ps > .05$). This means participants' arousal level did not confound the results of the message manipulations in this study.

Further, a split file test showed that in the strong argument condition, high vividness and low vividness messages do not differ in their impact on the negative affect people experienced, $F_{(1,74)} = .07, p = .79, M_{low-vivid} = 2.42$ vs. $M_{high-vivid} = 2.52$. However, in the weak argument condition, the high vividness and low vividness messages did differ significantly on their impact on negative affect, $F_{(1,80)} = 10.67, p < .01, M_{low-vivid} = 2.31$ vs. $M_{high-vivid} = 3.36$. Participants processing the high vividness message experienced more negative affect than those processing the low vividness message, $M_{high} = 3.36, M_{low} = 2.35$. These findings provide further support to H1, which predict that when message argument is weak, the high vivid message generates more negative affect than the low vivid message.

Similarly, to test if argument strength qualifies the effects of message vividness on message persuasiveness (H2), a two-way ANOVA was run with message vividness and argument strength as the independent variables and message persuasiveness was the dependent variable. A significant interaction effect would suggest that argument strength qualifies the impact of vividness strategy on message persuasiveness. Results reveal that the main effect of message vividness on

message persuasiveness was marginal, $F(1,156) = 3.70, p = .06, M_{low-vivid} = 4.71, M_{high-vivid} = 5.03$. The main effect of argument strength was not significant. $F(1,156) = .01, n.s.$ However, as predicted, the interaction effect of message vividness and argument strength was significant, $F(1,156) = 4.12, p = .04$ (Table 4 and Figure 10).

To further understand the nature of this interaction, a split file test on argument strength shows that in the strong argument condition, high vividness and low vividness messages did not differ in their impact on perceived message persuasiveness, $F(1,74) < .001, p > .05, Ms = 4.86$ vs. 4.86 . However, in the weak argument condition, high vividness and low vividness message did significantly differ in their influence on persuasiveness, $F(1,81) = 7.11, p < .01$. When argument strength was weak, participants were more persuaded by a highly vivid message than by a less vivid message, $M_{high-vivid} = 5.19, M_{low-vivid} = 4.58$). These findings support H2, which predicts that when message argument is weak, the high vivid message is perceived as being more persuasive than the low vivid message.

Mediation tests. In order to test the proposed affect-based processes through which message vividness affects persuasion, mediation analyses were run to examine the proposed mediation role of negative affect on how message vividness affect message persuasion (H3).

According Baron and Kinney's (1986) conceptual discussion on mediation effects, a variable functions as a mediator if it meets three conditions. These 3 conditions can be illustrated through a simple path diagram (see Figure 11). First, variations in levels of the independent variable should significantly account for variations in the presumed mediator (path a). Second, variations in the mediator

should significantly account for variations in the dependent variable (path b). Finally, when the presumed mediator is controlled (path a and path b), the previously significant relation between the independent and dependent variables will no longer be significant (i.e., path c), with the strongest demonstration of mediation occurring when path c is zero.

Based on Barron and Kenny's conceptualization, in order to support the mediation role of negative affect as predicted in H3, it has to be evidenced that 1) the use of a vividness strategy significantly affects negative affect, 2) negative affect has to significantly affect message persuasiveness, 3) the use of a vividness strategy has to significantly affect message persuasiveness. In addition, when controlled for negative affect, the previously significant effect of the use of vividness strategy on message persuasiveness has to be greatly reduced. If such effect was reduced from significance level to non-significant level, full mediation will be supported. A noticeable reduction of the effect although it remains significant would indicate a partial mediation effect. If no mediation occurs, the initial relationship will stay the same with or without controlling for the hypothesized mediator.

A series of regression analyses were used to test whether negative affect mediates how message vividness affects persuasion as predicted in H3. First, negative affect was regressed on message vividness condition. Result shows that the message vividness condition significantly affect negative affect ($\beta = .34, t = 3.27, p < .01$). Second, persuasiveness was regressed on negative affect. Result shows that negative affect significantly affect message persuasiveness ($\beta = .39, t = 3.77, p <$

.001). Third, message persuasiveness was regressed on the message vividness condition. Result shows that the effect of message vividness condition significantly affects message persuasiveness ($\beta = .29, t = 2.67, p < .01$). Controlling for negative affect, the effect was reduced to a non-significant level ($\beta = .17, t = 1.59, p = .12$). These findings support the hypothesized mediation role of negative affect on message persuasiveness (H3). It is supported that vivid (versus non-vivid) negative messages persuade through negative affect generated during message processing.

This suggests that when message argument is weak, message vividness can affect perceived message persuasiveness through the mediation of message processors' experienced negative affect (Figure 12). The results of regression analyses provide support to the speculation that affect-based mental imagery as induced by message vividness can exert positive influence on message persuasion (H3). As discussed previously, a negatively focused message often induces substance-based processing (Maheswaran and Meyers-Levy, 1990; Pham and Avnet, 2004). In this case, when the arguments in the message are perceived as being high quality, message receivers can achieve judgment confidence without considering the input of affect-based processes. However, when message arguments in the message are perceived to be weak, message receivers will utilize affective information (such as the negative affect they experienced when processing the negative message using mental imagery) to form judgments and evaluations.

Moderation role of chronic prevention focus. To further explore the role of message vividness in the weak argument condition, where reliance on message substance is expected to be less than in the strong argument condition, an analysis

was done to reexamine a research question proposed in the previous study. In study one, the potential moderating role of individual' chronic prevention focus on the impact of message vividness on persuasion was explored (RQ2 and RQ3). Even though study one failed to obtain a significant main effect of message vividness on persuasion, a significant interaction effect was observed, indicating that individuals' chronic prevention focus might significantly affect the impact of message vividness on persuasion, $\beta = -1.29, p = .04$. The pattern of the interaction between message vividness and prevention focus suggest that for low prevention focused individuals, high vividness might increase message persuasiveness, while for high prevention focused individuals, high vividness might reduce message persuasiveness (See Figure 6.). Nevertheless, these patterns only suggest that prevention focus might alter the direction of the impact of message vividness on persuasion. But without obtaining a significant zero-order impact of message vividness on persuasion, these results might just suggest a fluke in this study.

In study one, message argument quality was perceived to be relatively high. Therefore, the influence of affect-based processing might be suppressed by the predominant substance-based processing due to a particularly salient prevention focus activated by the negative message and the relative high quality of the message arguments. If the individual prevention focus does moderate the impact of message vividness on persuasion, it is necessary to first obtain the zero-order main effect of message vividness before any interpretation of the moderation effect can be advanced.

Therefore, in this second study, it was predicted that individuals' prevention focus moderates the effectiveness of message vividness strategy when message vividness significantly influences persuasion (H4). This moderation effect on the main effect of message vividness was expected to occur only in the weak arguments condition, because results in study one showed that when message argument is relatively strong, message vividness did not significantly influence persuasion.

First, one-way ANOVA tests were run to determine the main effect of vividness on mental imagery, negative affect, and message persuasiveness. Results showed that compared to the low vividness message, the high vividness message resulted in the use of more mental imagery ($F_{1, 79} = 7.02, p = .01, Ms = 4.65$ vs. 5.57), more experienced negative affect ($F_{1, 79} = 10.70, p < .01, Ms = 2.35$ vs. 3.36), and a higher level of perceived message persuasiveness ($F_{1, 79} = 7.11, p < .01, Ms = 4.58$ vs. 5.19). These results suggest that message vividness significantly affects participants' use of mental imagery, experienced negative affect, and perceived message persuasiveness when message arguments are weak.

Second, regression analyses were further run to test the hypothesized moderation effect of prevention focus on participants' perceived message persuasiveness in both strong and weak arguments conditions. Message vividness, prevention focus, along with the interaction of these variables were regressed on message persuasiveness. Results show that, when message arguments are weak, the main effect of vividness strategy on message persuasiveness was significant, $\beta = 1.26, p < .01$. Additionally, the main effect of prevention focus was significant ($\beta = 1.02, p < .01$), the interaction between vividness strategy and prevention focus was

significant, $\beta = -1.35$, $p < .05$. The interaction pattern is shown in Figure 13. It suggests that when arguments in the message were perceived weak, a high vividness message is more persuasive than a low vividness message. High prevention focused people are more persuaded than low prevention focused people. In addition, the persuasion advantage of a high vividness message is more pronounced for low prevention focused people than for high prevention focused people.

Split file tests further show that low prevention focus people experienced significantly more negative affect ($F_{1,80} = 4.40$, $p = .04$, $M_s = 2.48$ vs. 3.18) when processing the high vividness message than the low vividness message. And low prevention focused people also perceived the high vividness message more persuasive than the low vividness message ($F_{1,80} = 3.45$, $p = .07$, $M_s = 4.55$ vs. 5.02). However, for high prevention focused people, high and low vividness messages did not differ on either experienced negative affect or perceived message persuasiveness ($p_s > .20$). The hypothesized moderation effect of chronic prevention focus was supported.

Similar analyses were run in the conditions when message arguments were strong. In addition to the null effect of zero-order relationship between message vividness and persuasion ($F_{1,79} < .01$, $p > .99$, $M_s = 4.86$ vs. 4.86), the interaction between message vividness and prevention focus was not significant ($\beta = -.54$, $p = .47$, *n.s.*) even though the direction of the regression coefficient was consistent with those obtained in study one. These results further suggest that when arguments were strong in the negative message, message vividness did not affect persuasion,

and individuals' chronic prevention focus did not significantly change this null effect.

Based on the results in the two studies, it appears that people's chronic prevention focus can influence their perceived persuasiveness of high vs. low vividness messages. However, this subtle moderating influence only significantly altered the persuasion effect of high and low vividness messages when arguments were weak. When message arguments were relatively strong (as in study one and the strong argument condition in study two), people seemed to base their judgments and evaluations on message arguments, and were not influenced by non-argument related characteristics (such as message vividness).

In addition, when message arguments were weak, the persuasion advantage of a high-vividness (versus a low-vividness) message is only obvious for people with low prevention focus. For people with a high prevention focus, the high-vividness message was not more persuasive, and did not generate more negative affect than the low-vividness message. This suggests that in the context of negative message processing, people's chronic accessible prevention focus qualifies their perceived persuasiveness of high vs. low vividness messages. These results suggest that low prevention focused individuals might be particularly receptive to message vividness strategies and more likely to be persuaded by a high vividness message than a low vividness message. On the other hand, high prevention focused individuals appear to be more persuaded by any negative message and the added vividness of the message is less critical for these people.

These findings provide empirical support showing that even though message vividness strategy seems to be at odds with the likely substance-based processing in negative messages, it still can be effective in affecting persuasion through affect-based mental imagery processing when the arguments in the message are weak. In this case, message receivers will integrate the affective information generated during mental imagery processing in their final judgments. Study two showed that the strength of message argument qualified the impact of vivid message strategy on participants negative affect reactions to the message, and their perceived persuasiveness of the message. The high vividness message strategy generated more negative affect and was perceived as more persuasive than the low vividness message, only when the message argument is weak. When the message arguments were strong, these effects were not observed.

In addition, these findings demonstrated that when processing negative focused messages, vividness strategy can affect the persuasiveness of the message by impacting the negative affect experienced during processing. This process only happens when the message arguments are perceived as relatively weak. When the message was perceived as strong, affect-based persuasion does not occur. Even in a negative message environment where substance-based processing is facilitated by message activated prevention goals, message vividness strategies can still exert influence on persuasion when message argument is not convincing. In this case, the experiential information (e.g., feelings and affect) that occurred during mental imagery processing can be integrated into judgments and affect persuasion.

PART VII. General Discussions

The intuitive belief in the persuasiveness of vividly presented messages has been long held by both communication practitioners and researchers. Yet empirical research for the past two decades has not yielded consistent results. The persuasive power of vivid messages seems to be intriguing and yet elusive to empirical research. Over the years, researchers have taken different approaches to investigate the conditions that can facilitate or impede the “vividness effect”. Despite the early frustration that psychologists encountered, recent researchers have explained both the cognitive and experiential accounts in explaining the boundary conditions and the underlying mechanisms that drive the impact of message vividness.

Building upon this rich literature on vividness and persuasion, this dissertation attempted to trace the impact of message vividness on persuasion, and explore the mechanisms and situations in which it works in the context of negative health messages. Two controlled experiments were conducted to test whether message vividness strategy can facilitate persuasion in the context of a negatively focused message, and how message receivers’ motivation (i.e., prevention focus), message evoked affect and message substance can jointly influence the persuasive impact of message vividness.

Summary

Through two studies, it is demonstrated that in the context of negative messages, vividness strategy can facilitate persuasion through inducing affect-based mental imagery processing when the message argument is not perceived as strong.

When message argument is perceived as high in quality, however, such affect-based processes do not affect persuasion outcomes. Individual's prevention focus further qualifies the magnitude of the vividness effect. When individuals have high prevention focus, message vividness strategy does not significantly influence persuasion. Only when individuals' prevention focus is low, does message vividness positively influence perceived message persuasiveness. This may, in part, be due to the fact that for high prevention focus people, any negative message is viewed as somewhat persuasive, as long as the message provides relative strong arguments. However, low prevention focus people are more receptive to other message elements that are not directly related to message arguments, and they may be persuaded either by message arguments, or by affective experiences arising from a vivid portrayal of the negative outcomes.

Study one started to test whether vividness strategy in negatively focused messages can positively affect persuasion as predicted by the affect-based mental imagery theory (RQ1). It then examined whether and how individuals' chronic prevention focus as a motivation factor can moderate the message vividness effect on message persuasion (RQ2 and RQ3).

It is documented that the persuasion impact of message strategies is qualified by the accessibility of prevention goals (Pham and Avnet, 2001). These prevention goals can be either chronically accessible, or can be made salient through message valence. In this research, the negative focus of the HPV pamphlet was likely to activate individuals' preventional goals, and thus facilitate substance-based processing. However, when substance-based processing is facilitated by message

activated prevention goals, it seems that message vividness is less likely to affect persuasion through affect-based processes (MacInnis and Price, 1986). This is contradictory to the intuitive belief in the persuasion advantage of vivid messages, as well as the industry practice in using vividness strategies in negative health communications. Given the lack of empirical research on message vividness and mental imagery in negatively focused messages, it was important to determine whether message vividness strategy could still affect persuasion as predicted by affective-based mental imagery theories in a negative message.

Results from study one showed that there was no significant difference between the high and low vividness conditions on the use of mental imagery, experienced affect and perceived message persuasiveness. These results indicated that the affect-based mental imagery process was not effected in this study. This could have occurred because the message arguments were perceived as relatively strong ($M = 5.19$), both high and low vividness messages may have been perceived as equally persuasive because people base their judgments and evaluations primarily on message substance.

In study one, two competing theories were tested regarding the influence of accessible individual regulatory goals and message persuasion. On the one hand, the literature on the accessibility of regulatory goals and message processing suggests that when a message is negatively focused, prevention goals can be made salient to message receivers, and thus facilitate substance-based detail processing of message arguments and claims (Maheswaran and Meyers-Levy, 1990; Pham and Avnet, 2001). According to this view, high prevention focus should influence

processing in the same manner as message activated prevention goals. This should result in more substance-based processing, and less affect-based processing, thus hindering the influence of message vividness on persuasion through affective input in judgments and evaluations. Therefore, it is predicted that when confronted with negative imagery inducing messages, people's chronic prevention regulatory focus moderates the effectiveness of message vividness on persuasion. Specifically, people with low (versus high) prevention focus should generate more mental imagery, experience more negative affect, and evaluate the message more positively when the message is high (versus low) in vividness.

On the other hand, recent theories on regulatory fit posit that the accessibility of prevention goals can be made salient through either message focus or individual chronic prevention focus. They propose that when a matching of these goals occurs (i.e., regulatory fit), message receivers can experience processing fluency and engage more with the message. This, in turn, can be transferred to the judgment process, and result in more positive evaluations (Lee and Higgins, in press). According to this view, in processing a negative message that involves vividness strategies, generating mental imagery may be more difficult than it is in processing positive messages since substance-based processing is expected to be facilitated by the message evoked prevention goals. Therefore high prevention focused individuals (who enjoy a better "fit" with negative focused messages than low prevention focused individuals) might be more likely to experience positive fluency feelings and engage more in imagery processing than low prevention focused individuals. As a result of their increased engagement with the message,

they are more likely to be receptive to a vivid message strategy, and experience more negative affect. This could lead them to perceive the message as more persuasive than low prevention focused individuals.

Results in study one indicates that individuals' chronic prevention focus may moderate the impact of message vividness on persuasion. Even though the main effect of message vividness on persuasion was not significant, the direction of the moderation effect seems to suggest that message vividness might have a positive effect for people with low prevention focus (but not for people with high prevention focus). However, without a significant zero-order effect of message vividness, any further speculation about the higher order moderation effect will not be well grounded.

In study two, message substance was manipulated to test a boundary condition – argument strength on the effectiveness of using vividness strategy. It was found that message vividness did significantly affect people's use of mental imagery, experienced negative affect and perceived persuasiveness of the message only when message arguments were perceived weak (H1, H2). When the message arguments were perceived as strong, message vividness did not exert significant impact on persuasion. Results in study two also suggest when message vividness does influence persuasion, subjects' negative affective experience mediates the relationship of message vividness and persuasion (H3).

In addition, following up on RQ3 in study one, when the message arguments were weak, individuals prevention focus was found to significantly moderate the impact of message vividness on persuasiveness. The results in this study provide

support for the moderation effect of prevention focus on the effectiveness of message vividness on persuasion. They suggest that individuals' chronic prevention focus does affect the persuasiveness of the high and low vividness message. These results support the view that individuals' chronic prevention focus further increase people's reliance on message substance-based processing in the context of a negative message.

The competing account derived from the regulatory fit literature does not match the findings from the second study. One reason this prediction might not have been supported is that past conceptualizations of regulatory fit have not been fully developed. To date, the regulatory fit literature has only tested the proposed "regulatory fit" effect by labeling people as either prevention or promotion oriented. Thus they have treated it as opposite ends of a single motivation system. However, more recent research has conceptualized the regulatory system as composed of two separate systems (a prevention system and a promotion system), and people can be high or low on each system (Higgins et al, in press). Thus fit is actually a more complex issue than previously viewed. Here, we focused just on the prevention system since this would most likely have been activated by a negative message.

Even though results in this study seems to contradict the prediction that high prevention focused individuals should enjoy a higher level of regulatory fit, and thus be more receptive to message vividness strategies, they may suggest some directions that future research can take. For example, regulatory fit literature generally suggests two mechanisms (i.e., "feeling right" and "engagement strength") that underlie the persuasion advantage of matching people's regulatory focus with the

emphasis of a persuasive message. These two mechanisms are supposed to concur when regulatory fit is achieved, that is, people feel their processing is more fluent and thus engage more with the message they are processing. However, these speculations only predict that the strength of engagement with the message will be increased as a result of regulatory fit. They do not specify what type of message elements people will engage with. For instance, it is not clear whether people will engage with specific message arguments or with imagery inducing message descriptions when regulatory fit occurs. Future research should focus on further specifying the elements of message engagement that will be effected by regulatory fit in greater detail (Lee and Higgins, in press).

Overall, the results in these two studies illustrate the interaction of the two fundamental processing systems – the substantive and the experiential (Epstein, 1990), and how affect and heuristics in the experiential system can be infused in the judgment and evaluation process (Forgas, 1996). When processing is primarily substance based (i.e., the processing strategy that is induced by the message evoked salience of prevention goals), vividness does not cause negative affective reactions and cannot impact judgments and evaluations. This occurs because there is no opportunity for input from the experiential processing system (such as mental imagery processing). This is the case when the message arguments are strong. However, when the arguments are weak, non-substance based input, such as affective and experiential information may be utilized. This allows affect-based processing to be infused in the judgment and evaluation process.

Study two also demonstrates that when the message environment provides an opportunity for the inclusion of information from the experiential system, message vividness can lead to heightened negative affect reactions through mental imagery. As a result, this can have a significant impact on message evaluation (H1, H2). The hypothesized mediation role of negative affect was supported by the data in study two (H3). Mediation analyses found that when the message arguments were perceived as being weak, a vividness strategy significantly affected perceived message persuasiveness through the mediation of the negative affect experienced during processing.

To sum up, the two studies demonstrate that in the context of a negative message, vividness can exert positive influence on persuasion. However, this influence is subtle and qualified by message argument strength and the individual's chronic prevention orientation.

Theoretical Implications

The quest for understanding the impact of message vividness on human information processing and persuasion has a long tradition (Aaker, 1975; Nisbett and Ross, 1980). Despite the limited and elusive evidence from the early research, multiple perspectives have more recently been proposed to explain this intriguing phenomenon. Theoretical advancement has been made mainly through two important perspectives, the cognitive elaboration account and the mental imagery account.

The cognitive elaboration account proposes that the availability of vivid information does not guarantee persuasion. Only when availability is combined with positive valence as a result of elaboration, could vivid information exert positive impact on attitudes and behaviors (Kisielius and Sternthal, 1986; Keller and Block, 1997). It is argued that the valence of elaboration is a result of a number of variables, including the resource demands of the message, capacity for processing, the motivation of message recipients, as well as the salience of other specific information that can rend elaboration positive, negative or neutral in relation to message advocacy (Keller and Block, 1997). The cognitive elaboration account provides some explanation of the mixed findings in the literature on message vividness effect. However, this account does not include the potential impact of affect-based mechanisms during message processing.

Extending the traditional cognition-based approach, the affect and experiential aspects of human information processing have shown tremendous development over the past decades (Zajonc, 1980; Epstein, 1990). Theories of mental imagery have started to be applied in consumer behavior and persuasion research involving vividly presented messages. The early assumption of a message based effect was replaced by a process-based approach. In this newer perspective, the consumers' processing mode evoked by message characteristics (such as vividness) is conceived as the underlying factor that governs judgment and evaluation (MacInnis and Price, 1987; Epstein, 1990). Mental imagery is proposed to affect the positive impact of message vividness when consumers engage in an affect-laden experiential mode of processing.

Echoing early speculations in vividness research (Thompson and Wood, 1983), this research provides evidence to support the belief that the impact of message vividness can be achieved through the affective consequences of mental imagery processing. This can be true even in a negatively focused message. Previous research has shown that the negative focus of a message can trigger substance-based processing, and encourage consumers to base their judgment and evaluation on a detailed analysis of the message argument quality rather than subjective experience during processing (such as the affective experiences consumers have during message processing) (Maheswaran and Meyers-Levy, 1990; Pham and Avnet, 2001). This dissertation focused on testing the impact of message vividness strategy on consumers' judgment and evaluation in a negative message context. In this sense, the results reported in this dissertation provide a more stringent test for the effects of message vividness strategy on judgments and evaluations.

At a general level, this research demonstrated the possibility that in a predominantly substantive processing environment, experiential information (such as the emotionality from mental imagery processing) can exert influence on judgment and evaluation. However, this only happens when the message arguments are not strong. The results reinforce the presumed interactive relationship of the two fundamental processing systems proposed in the Cognitive-Experiential Self Theory (CEST) (Epstein, 1990). This research showed that when a negative focused message was perceived as relatively strong in argument quality, message receivers based their judgment on message arguments, and did not incorporate affective

experiences during processing in evaluating message persuasiveness. Therefore, there was no observed difference in perceived evaluation due to message vividness strategy in study one or in study two when message quality was perceived as strong. However, when a negative focused message was perceived to be weak, message receivers incorporate their affect experiences as induced by message vividness to form their evaluations (H1). Therefore in study two, the subjects were persuaded more by the high vividness message than the low vividness message when message argument was perceived as weak (H2). These results also provide evidence for the Affect-Infusion-Theory (AIT) (Forgas, 1996) by demonstrating that affect-based experiential information (such as negative affect experienced during processing) can be an important input in the judgment and evaluation process and mediate the impact of message vividness on persuasion (H3).

In addition, this dissertation suggests multiple avenues that future research can take on to future illuminate the interactive relationship of the two fundamental processing systems in influencing judgment and evaluation. For example, this research did not specifically measure the “judgment confidence” (Chaiken, 1980; Kruglanski, 1980) that message receivers feel during message processing. It was only inferred that when the message arguments were weak, subjects experienced a less than sufficient level of confidence to form judgment and evaluation. It might be helpful to directly measure respondents’ judgment confidence in future research. This could provide added support for both the Lay Epistemic theory (Kruglanski, 1990) and the “sufficiency principle” in the HSM model (Chaiken, et al., 1989). Additionally, it will help to directly demonstrate that when message arguments are

weak, message receivers integrate affective and other non-substance based information in forming judgment and evaluation in order to validate their information processing.

At a more specific level, this dissertation provides implications and poses questions regarding the impact of the motivational factors (such as an accessible prevention goal evoked by the message, or that individuals have as a chronic orientation) on the integration of experiential input in a predominant substantive processing mode. As Pham and Avnet (1994) suggests, the salience of regulatory goals can determine the processing mode (substantive or experiential) that people use to form judgment. Results in this research provide evidence for this argument. This was true for both the message evoked prevention goals and individual chronic assessable prevention goals. Specifically, in both studies, when the message arguments were perceived relatively strong, the message activated prevention goals led subjects to base their judgment solely on the message argument. No difference was found resulting from the affect-based process that was induced through message vividness strategy.

Unlike most of the recent research in regulatory fit, this research operationalized regulatory focus difference within a single motivation system (i.e., the prevention system). It investigated the possibility that a high chronic prevention focus can form a higher fit for negatively focused messages, and how this higher level of regulatory fit might play a role in the impact of message vividness strategy on message persuasion.

However, this research did not find supporting evidence for the advantage of “feeling right” and “engagement strength” on persuasion for high prevention focused individuals (who are supposed to be experiencing a higher level of “fit” with the negative focused message) as suggested by the regulatory fit literature. On the contrary, in study two, high prevention focused people were found not to be more persuaded by the high vividness message, while the low prevention focused people were found to be positively influenced by the high vividness message. The failure to support the reasoning regarding the persuasion advantage entailing a regulatory fit might suggest further conceptual and empirical development of the theoretical propositions of regulatory fit and its effect on persuasion. For example, future research might need to examine the proposed mechanisms of regulatory fit (i.e., “feeling right” and “engagement strength”) more closely, and specify the boundary conditions in which these mechanisms might affect persuasion outcomes.

Moreover, since the “feeling right” mechanism touches upon the meta-cognitive experience of processing fluency, it might also be helpful to conceptually and empirically develop a hierarchical structure that could be used to explain these influences on persuasion outcome. It might be interesting to test the interaction between the experiential information at the meta-cognitive level (such as processing fluency) and the affect reactions to the message content (Schwartz, 2004) during processing.

Practical Implications

This research also provides practical insights to the design and management of negative messages in persuasive communications. In both social marketing and commercial marketing communication practice, negative information can enhance persuasion outcome if used appropriately. Messages focusing on negative outcomes can activate people's prevention goals (Lee and Higgins, in press), and thus lead message processors to rely on message substance (e.g., claims and arguments), rather than heuristic information (i.e., non-substance factors, such as message vividness, attractiveness of endorsers, etc.) in forming judgment (Pham and Avnet, 2004). This research suggests that when the prevention goals are made salient, the persuasion effect can be influenced by both argument quality and, in some circumstances, other input, such as affect and heuristics. In this case, the extent to which such non-substance based information can be integrated into judgment and evaluation, can determine the actual impact of vividness strategies.

This research found empirical support that in a negative message, vividness strategies can affect persuasion only when message substance is not strong. This implies a counterintuitive consideration regarding the use of vividness strategies. Opposite to the common belief that there is a persuasive advantage of vividly presented messages, it is shown that when the message arguments in a negative message are strong, such vividness strategies do not provide any advantage for persuasion outcome. Given the soaring expense of using multi-media presentation

technology in message creation and production, ignorance of this finding could lead to lower or even negative ROI for marketer and advertisers.

Therefore, these results provide practical guidelines for practitioners. These results suggest that message vividness strategies should only be used in situations where strong arguments are not available, or not easily comprehended, by consumers.

Limitations

A number of limitations in both a methodological and conceptual sense need to be acknowledged in this dissertation research. First, mental imagery processing is measured through self-report measures (Ellen and Bone, 1992). The measurement has not been widely used in the advertising and consumer behavior literature. Other than that, the occurrence of mental imagery processing is largely inferred. This could open the doors to the a few alternative explanations. For example, the research participants' ability to access and report the way he / she processed the vivid information could be biased by social desirability (Wright, 1980). Since message vividness and mental imagery seem to both be exerting influence on judgment and evaluation when message processing environment is open for experiential input, self-reported mental imagery processing can be inflated by perceived message vividness, or vice versa. This suggests a greater need for future research to develop reliable measures that can be used to directly measure the extent of mental imagery processing. It may also be helpful to measure social

desirability characteristics in future studies in order to control for the biases in the self report measures.

Second, like many studies on the “vividness effect”, this research did not take full account of research participants’ cognitive elaboration in response to the negative health message. The conventional cognitive response measures assess an overall degree of cognitive elaboration. However, this approach did not measure the directional nature of the cognitive elaboration. As the Availability-Valence hypothesis suggested, the valence of cognitive elaboration determines the direction of persuasion effect. That is, cognitive elaboration can enhance, undermine, or do nothing in influencing persuasion outcome. Given that there is no reliable measure to assess such valence, this hypothesis still needs further validation. This reflects a void in the current psychological research regarding the valence of thoughts. Reliable measures and coding schemes that can access the valence (or “favorability”) of thoughts and feelings in relation to the message advocacy are greatly needed. These measures will equip information processing researchers with better tools to further detangle the interactions between the reason based processing system and the affect and experience based processing system.

Third, following previous research (Block and Keller, 1997), the two studies reported in this dissertation manipulated message vividness by using personalized versus non-personalized messages. This was done to minimize the potential confounding factors and alternative explanations that might be associated with other types of manipulations. A number of operational strategies have been used to manipulate vividness, such as colorful pictures and instructions to imagine and

visual imagery (McInnis and Price, 1987). Future studies using other operational strategies are needed to replicate the conceptual design of this research, and provide evidence for the robustness of these effects. Moreover, topics other than health prevention should be tested to further strengthen the results found in this research.

Overall these methodology limitations might also contribute to the small effect size of message vividness manipulations reported in this research. In addition, these may reflect limitations at a conceptual level and suggest directions for further theory building. Mental imagery, as a way of knowing has generated curiosity among generations of psychologists, artists, and behavioral scientists (Singer, 1969). However, only recently has mental imagery been conceptualized as a primary information processing mode. This dissertation research reflects just some of the possible effects of mental imagery processing in a specified context. With further advancement and refinement of mental imagery theory, it is hoped that a more in-depth knowledge of how vivid message evoked mental imagery affects persuasion can be more fully understood. It is also hoped that this knowledge of mental imagery processing can be applied in fields such as advertising, social marketing communication, public health communication, to improve people's well-being and the economic development in the society.

TABLES

Table 1. Study One Means and Standard Deviations on Control Variables

	Gender	Age	Sexual behavior	Prior knowledge	Perceived severity	Perceived vulnerability	Efficacy	Imagery ability
Low vividness message	1.52 (.51)	19.23 (.90)	2.39 (1.33)	4.00 (2.13)	5.27 (1.70)	1.63 (.25)	1.26 (.19)	.63 (.10)
High vividness message	1.72 (.45)	19.41 (1.40)	2.62 (1.41)	4.19 (1.59)	5.47 (1.39)	1.89 (.29)	1.19 (.18)	.56 (.09)

Table 2. Study One Means and Standard Deviations on Message Persuasiveness

	Low Vividness	High Vividness
Low Prevention Focus	4.43 (1.23)	4.95 (1.26)
High Prevention focus	4.82 (1.14)	4.17 (1.29)

Table 3. Study Two Means and Standard Deviation on Negative Affect

	Low Vividness	High Vividness
Weak Argument	2.31 (1.50)	3.36 (1.27)
Strong Argument	2.42 (1.59)	2.52 (1.66)

Table 4. Study Two Means and Standard Deviations on Message Persuasiveness

	Low Vividness	High Vividness
Weak Argument	4.56 (1.14)	5.18 (.91)
Strong Argument	4.86 (.91)	4.86 (1.21)

FIGURES

Figure 1. Study One Pre-exposure Prevention Focus Scores

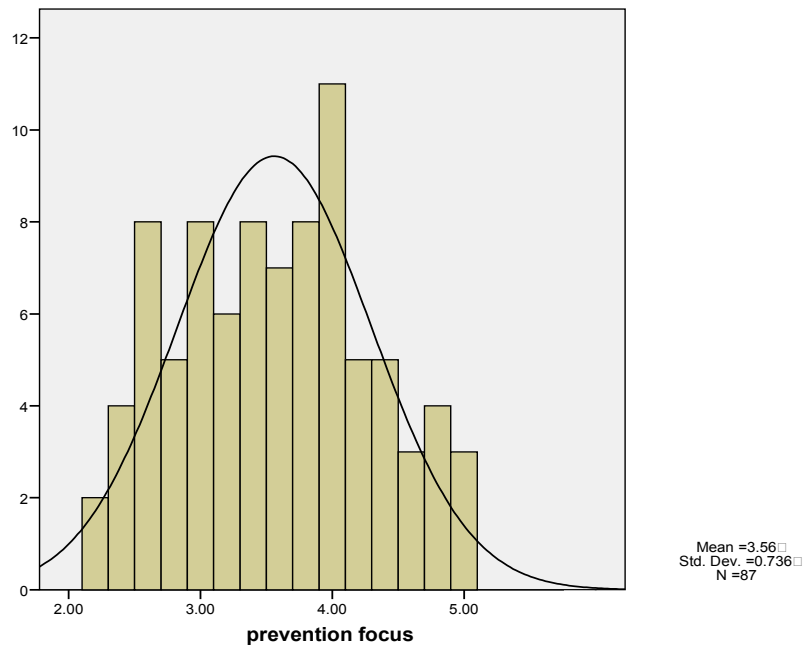


Figure 2. Study One Post-exposure Prevention Focus Scores

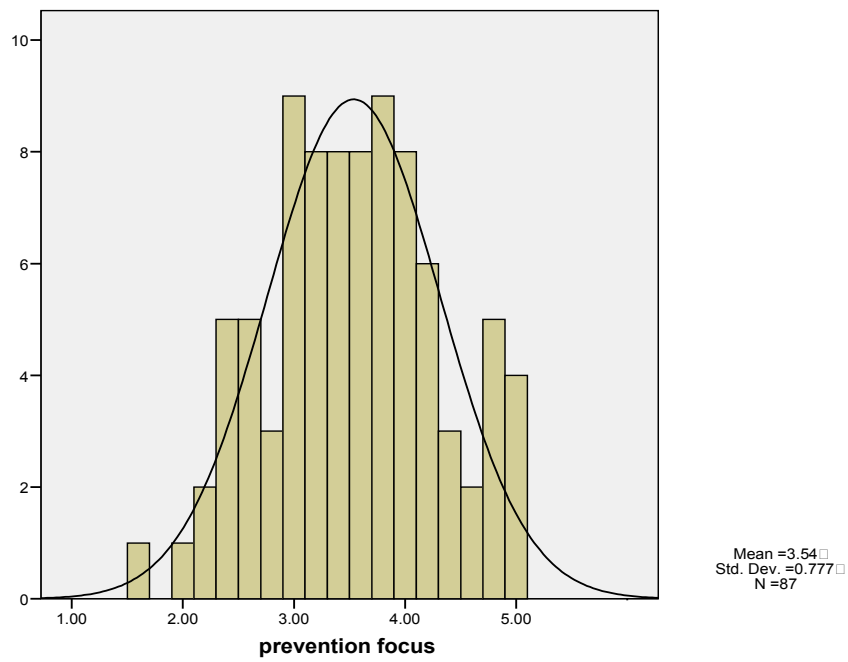


Figure 3. Study One Pre-exposure Promotion Focus Scores

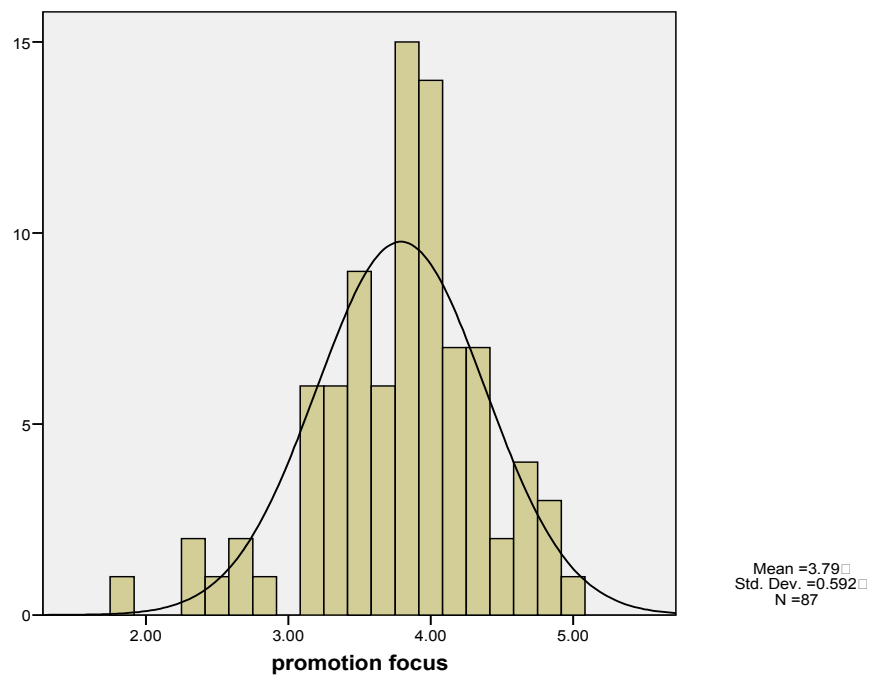


Figure 4. Study One Post-exposure Promotion Focus Scores

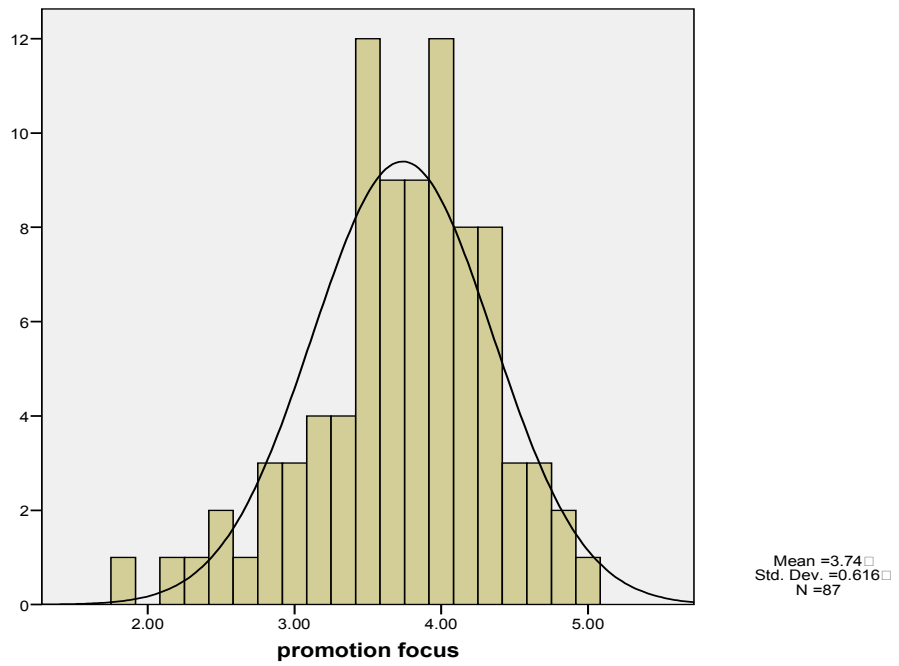


Figure 5. Conceptual Path Diagram of Moderation Effect

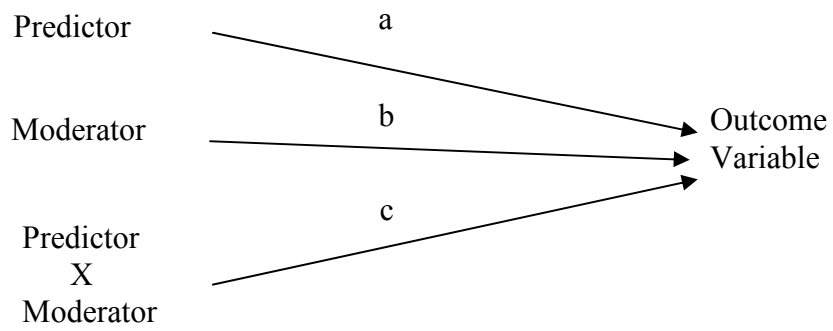


Figure 6. Study One Interaction of Prevention Focus and Message Vividness Conditions on Persuasiveness

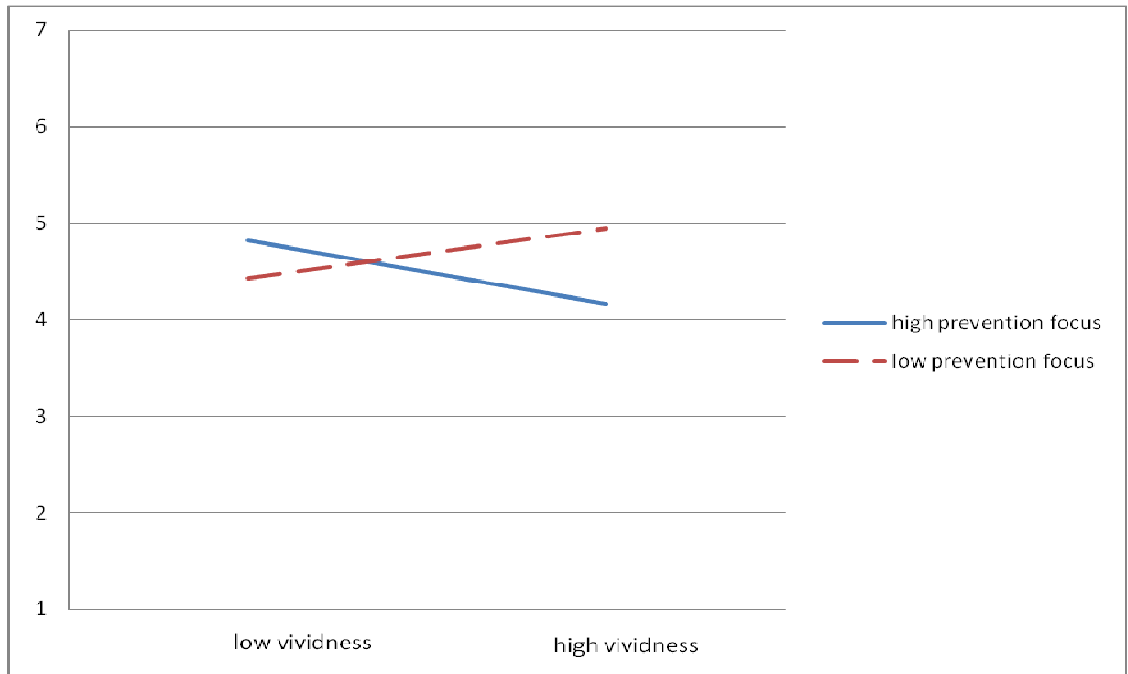


Figure 7. Study Two Prevention Focus Scores

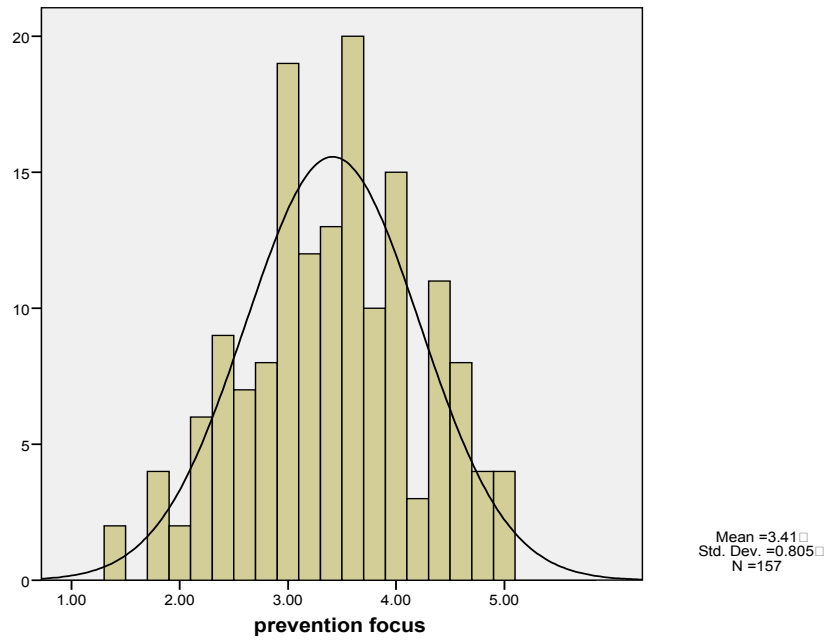


Figure 8. Study Two Promotion Focus Scores

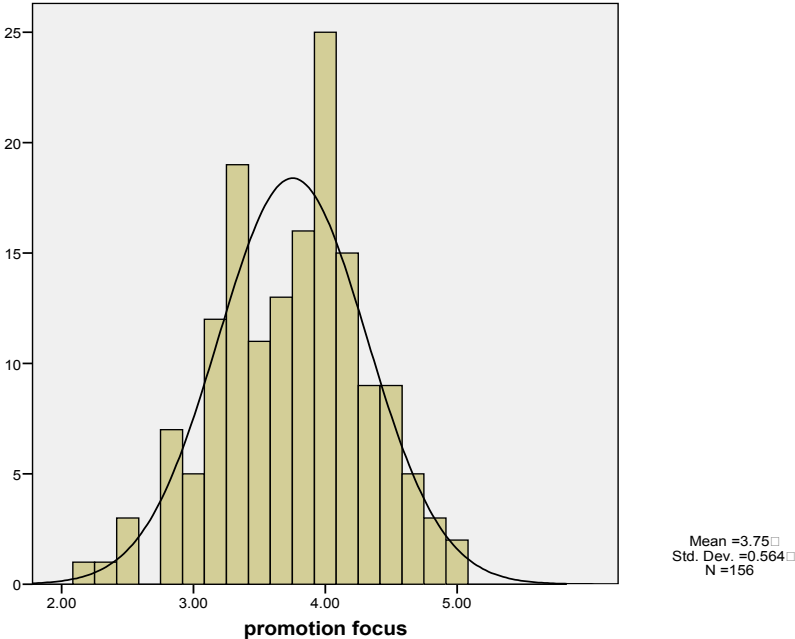


Figure 9. Study Two Interaction of Argument Strength and Message Vividness on Negative affect

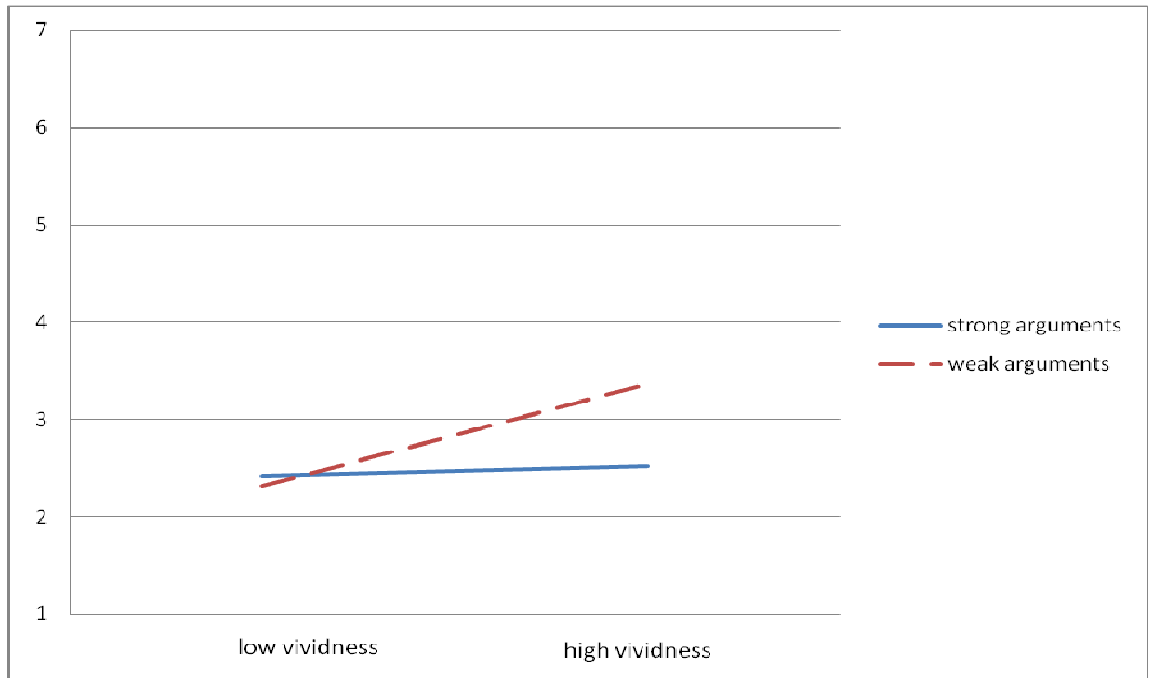


Figure 10. Study Two Interaction of Argument Strength and Message Vividness Conditions on Persuasiveness

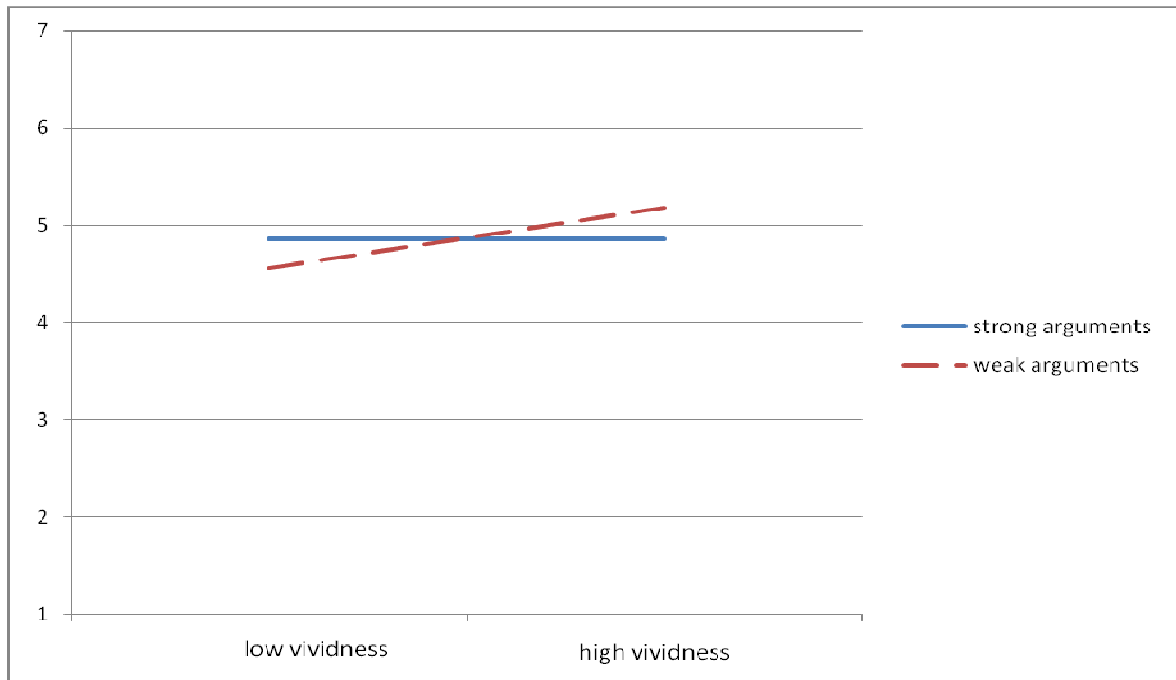


Figure 11. Conceptual Path Diagram of Mediation Effect

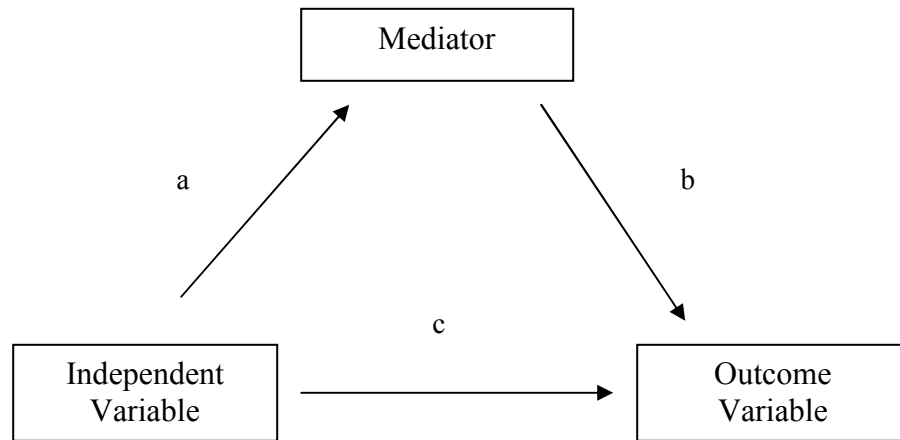
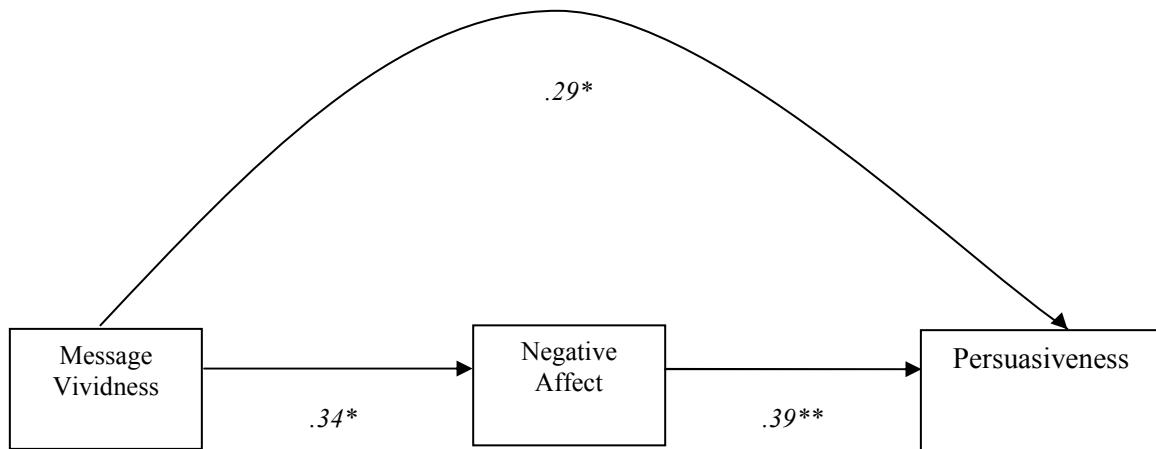
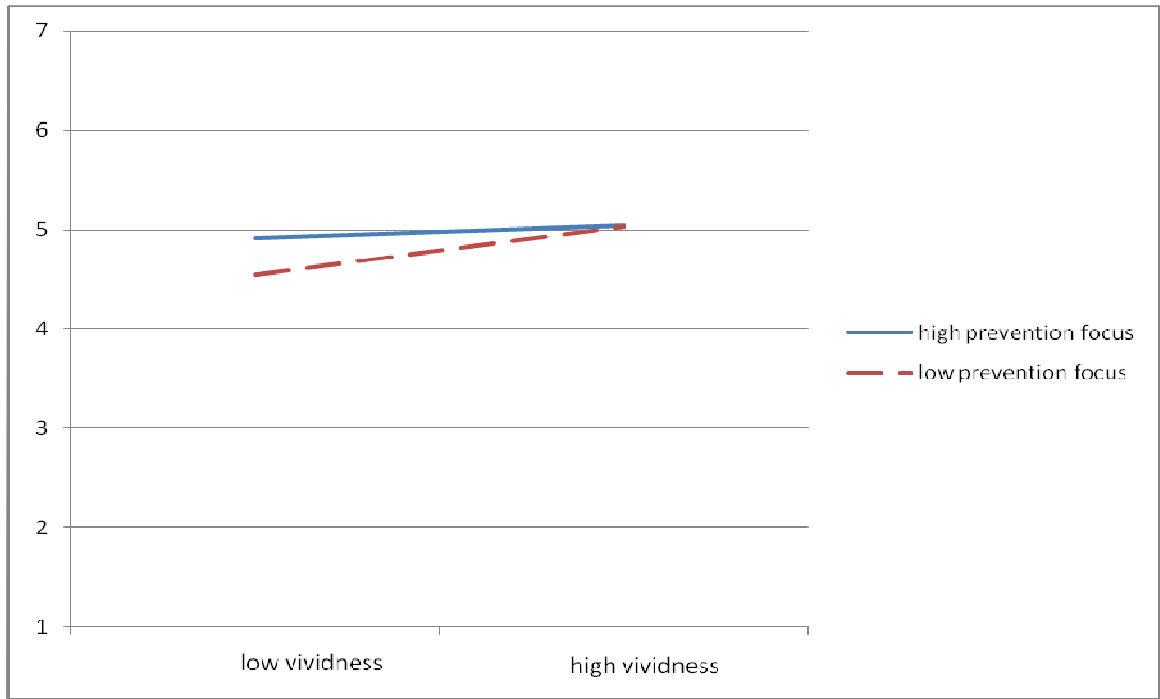


Figure 12. Mediation of Negative Affect



** $p < .01$ ** $p < .001$*

Figure 13. Study Two Interaction between Vividness Strategy and Prevention Focus on Persuasiveness



APPENDICES

Appendix 1. Message Vividness Manipulation

Personalized Version:

What Are People's Common Reactions Upon Finding Out HPV?

JEFF –

“When Linda hit me with the news that she had HPV, I was shocked. My girlfriend had an STD! How did she get it? I thought we had a monogamous relationship. Did I have HPV too? What was going on there?”

Linda said either of us could have gotten the virus long before we met. And once one of us contracted HPV the likelihood was both of us would get it. The only way to find out for certain if I had HPV was to get an exam since the warts can be invisible to the naked eye. Then she said we'd have to start using condoms and spermicide to decrease the likelihood of further outbreaks. She added that they would provide protection against other STDs – something we had never really considered until now. I was not thrilled with the prospect of using condoms, but she had already bought some in different styles and said we could practice using them. My mood started getting a little better. Linda told me how much she cared about me and that she hoped we could work this through together. She asked me whether I needed some time to think about everything and I said I did.

I went to the health center this afternoon and had a checkup. The doctor applied vinegar to my penis to make any warts more apparent. He found three small flat warts and treated them. I felt a slight burning sensation, but it went away pretty quickly. I have to go back for follow-up to keep the virus under control. I also read the health centre handouts on STDs and HPV. I always had associated STDs with prostitutes and drug addicts. But I was wrong – more than one million people are diagnosed with HPV every year. Now I realize everyone who is sexually active is at risk. Even me.

Linda and I are going to meet in a couple of hours. I've gone back and forth a couple of times about our relationships, but basically I'd like us to stay together. I'll tell her that tonight.”

LINDA –

“When I learned that the results of my Pap smear were abnormal, I was really scared. I had gone to the health service for my regular examination. I didn't think anything was wrong. The nurse told that Pap smear results showed that I needed further evaluation for HPV – Human papilloma virus, a family of viruses that sometimes causes genital warts or precancerous conditions. I had nothing but questions. How did I get a sexually transmitted disease? I don't sleep around. How will I ever tell my boyfriend? And worse, would I get cancer? The likelihood of my getting cancer was very slight, the nurse explained, but I did

need a colposcopy – an examination of my cervix and other genital areas to check for genital warts and possibly take tissue samples for testing. I felt dirty, but the nurse told me that it would be a good idea if I could look at HPV for what it is – a disease, not a moral statement. Nowadays, anyone who is sexually active can get a sexually transmitted disease, or STD. And, HPV is becoming an epidemic on college campuses.

HPV lesions can be successfully treated, she continued. Although the virus most likely remains in the tissues, the ultimate goal of treatment is for lesion growth to be suppressed by the immune system. She added that the chances of my treatment being successful would improve if my boyfriend were treated at the same time.

As soon as I got back to my dorm, I called my best friend, Liz. I was feeling pretty anxious and sort of panicky. How was I going to tell my boyfriend, Jeff? Initially, I was frightened about telling him anything, but know that I would want to know if the situation were reversed. Liz and I talked about how I would feel if Jeff blamed or rejected me. It would be tough, but I'd cope.

I decided to get some information from the health center about what kinds of sex would be okay for us before I talked to Jeff so I could reassure him that this wasn't the end of our sex life. I also need to reassure myself.

Last Tuesday, I went for my colposcopy. The doctor used a colposcope – a magnifying instrument like a microscope – to look more closely at my cervix. He also took samples to send to the lab and treated some warts near my vagina. It was fairly quick and I only felt a slight pinch.

Thursday I got the colposcopy results. I do have HPV on my cervix. I made an appointment to return for treatment. After that, I will have to go back for follow-ups, including regular Pap smears as recommended.

Thus morning Jeff and I had “the talk”. Definitely sweaty palms time for me. I told him about HPV as calmly as I could. I decided to continue our conversation tomorrow.”

Non-personalized Version:

What Are People's Common Reactions Upon Finding Out They Have HPV?

Men –

Most men are shocked when they find out they have HPV. Many of them question the loyalty of their partners and the monogamous nature of their relationships.

Either partner could have gotten the virus before they met each other. Statistically, once one of them contracted HPV, the likelihood was that both partners would get

it . In the majority of cases, men can only be certain they have the HPV by getting an exam, since the warts can be invisible.

A large percentage of men who had HPV said they started using condoms and spermicide to decrease the likelihood of further outbreaks. This also provides protection against other STDs. Most men can get used to using condoms. The majority of couples who have HPV choose to stay together after some thinking of their relationship.

Generally, the checkup at the health center involves relative simple procedures. A slight sensation of discomfort may occur, but it is brief. The majority of men get further information from the health center and go back for follow-ups to keep the virus under control.

Women –

Most women who learn their PAP smears are abnormal found the results shocking and unbelievable.

When told that the PAP smear results showed further need for evaluation for HPV, which can cause genital warts or precancerous condition, most of the women questioned themselves and their relationship with their partners.

Clinical research shows that the likelihood of getting cancer is slight, but most women need a colposcopy – an examination of the cervix and other genital areas to check for warts and take tissue samples for testing. On average, the treatment is fairly quick and most women only feel a slight discomfort. The majority of women need to return for treatment and then have a close follow-up, including regular Pap smears.

HPV lesions can be successfully treated although the virus most likely remains in the tissues, the ultimate goal of treatment is for lesion growth to be repressed by the immune system. On average, the chance of a successful treatment improves if these women's partners are treated at the same time.

A large percentage of women experienced mixed feelings and needed emotional support from close friends and family.

Most women read the information from the health center, and learn about what kinds of sex would be okay for them to have so that they can reassure their themselves about their relationships.

Appendix 2. Communication Evoked Feelings (Goodstein, Edell, and Moore, 1990)

Scale for General Feelings

- Upbeat feelings (*active, amused, attentive, attractive, carefree, cheerful, creative, delighted, elated, energetic, happy, humorous, independent, industrious, inspired, interested, joyous, lighthearted, playful, pleased, proud, satisfied, stimulated, strong*)
- Warm feelings (*affectionate, calm, emotional, hopeful, kind, moved, peaceful, sentimental, warmhearted*)
- Disinterested feelings (*bored, critical, defiant, disinterested, dubious, dull, skeptical, suspicious*)
- Uneasy feelings (*afraid, anxious, concerned, contemplative, depressed, edgy, lonely, pensive, regretful, sad, tense, troubled, uncomfortable, uneasy, worried*)

Appendix 3. Extent of Mental Imagery Processing Measures (Ellen and Bone, 1991)

QUANTITY

As you viewed the message, to what extent did any images come to mind?
(To a very small extent....To a very great extent)

While viewing the message, I experienced (Lots of images....Few or no images)

All sorts of pictures, sounds, tastes and/or smells came to my mind while I viewed the message.
(Strongly Agree....Strongly Disagree)

EASE

How difficult or easy were the images to create? (Extremely Easy....Extremely Difficult)

How quickly were the images aroused?(Very Quickly....Not quickly at all)

I had no difficulty imagining the scene in my head.(Strongly Agree....Strongly Disagree)

VIVIDNESS

The imagery which occurred while I viewed the message was:
(Does not Describe at All....Describes Perfectly)

Clear
Pale
Fuzzy
Detailed
Weak
Vivid
Intense
Vague
Lifelike
Sharp
Well-Defined

Appendix 4. Bett's Questionnaire of Mental Imagery – Shortened Version (Sheenan, 1967)

Visual Imagery						
<i>Think of each of the following scene (think of some relative or friend whom you frequently see if necessary), considering carefully the picture that rises before your mind's eye, and classify the images suggested by each of the following questions as indicated by the degree of clearness and vividness on the following scales.</i>						
Perfectly clear and as vivid as the actual experience	Very clear and comparable in vividness to the actual experience	Moderately clear and vivid	Not clear or vivid but recognizable	Vague and dim	So vague and dim as to be hardly discernible	No image present at all, you only know that you are thinking of the object
1	2	3	4	5	6	7
(1) The exact contour of face, head, shoulders, and body.						
1	2	3	4	5	6	7
(2) Characteristic poses of head, attitudes of body, etc.						
1	2	3	4	5	6	7
(3) The precise carriage, length of step, etc., in walking.						
1	2	3	4	5	6	7
(4) The different colors worn in some familiar costume.						
1	2	3	4	5	6	7
(5) The sun as it is sinking below the horizon.						
1	2	3	4	5	6	7

Auditory Imagery							
<i>Think of each of the following sound, considering carefully the image which in each case comes to your mind's ear, and classify the images suggested by each of the following questions as indicated by degrees of clearness and vividness on the following scales.</i>							
Perfectly clear and as vivid as the actual experience	1	2	3	4	5	6	7
Very clear and comparable in vividness to the actual experience			Moderately clear and vivid	Not clear or vivid but recognizable	Vague and dim	So vague and dim as to be hardly discernible	No image present at all, you only know that you are thinking of the object
(6) The whistle of a locomotive.							
	1	2	3	4	5	6	7
(7) The honk of an automobile.							
	1	2	3	4	5	6	7
(8) The mewling of a cat.							
	1	2	3	4	5	6	7
(9) The sound of escaping steam.							
	1	2	3	4	5	6	7
(10) The clapping of hands in applause.							
	1	2	3	4	5	6	7

Cutaneous Imagery

Think of "feeling", or touching each of the following, considering carefully the image which comes to your mind's touch, and classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness on the following scales.

Perfectly clear and as vivid as the actual experience	Very clear and comparable in vividness to the actual experience	Moderately clear and vivid	Not clear or vivid but recognizable	Vague and dim	So vague and dim as to be hardly discernible	No image present at all, you only know that you are thinking of the object
1	2	3	4	5	6	7
(11) Sand.						
1	2	3	4	5	6	7
(12) Linen.						
1	2	3	4	5	6	7
(13) A fur muff.						
1	2	3	4	5	6	7
(14) The prick of a pin.						
1	2	3	4	5	6	7
(15) The warmth of a tepid bath.						
1	2	3	4	5	6	7

Kinesthetic Imagery

Think of performing each of the following acts, considering carefully the image (do not confound this with an incipient movement of the muscles concerned) which comes to your mind's arms, legs, lips, etc., and classify the image suggested as indicated by the degree of clearness and vividness on the following scales.

Perfectly clear and as vivid as the actual experience	Very clear and comparable in vividness to the actual experience	Moderately clear and vivid	Not clear or vivid but recognizable	Vague and dim	So vague and dim as to be hardly discernible	No image present at all, you only know that you are thinking of the object
1	2	3	4	5	6	7
(16) Running upstairs.						
1	2	3	4	5	6	7
(17) Springing across a gutter.						
1	2	3	4	5	6	7
(18) Drawing a circle on paper.						
1	2	3	4	5	6	7
(19) Reaching up to a high shelf.						
1	2	3	4	5	6	7
(20) Kicking something out of your way.						
1	2	3	4	5	6	7

Gustatory Imagery

Think of tasting each of the following, considering carefully the image which comes to your mind's mouth and classify the images suggested by each of the following questions as indicated by degrees of clearness and vividness on following scales.

Perfectly clear and as vivid as the actual experience	1	2	3	4	5	6	7
Very clear and comparable in vividness to the actual experience			Moderately clear and vivid	Not clear or vivid but recognizable	Vague and dim	So vague and dim as to be hardly discernible	No image present at all, you only know that you are thinking of the object
(21) Salt.	1	2	3	4	5	6	7
(22) Granulated (white) sugar.	1	2	3	4	5	6	7
(23) Oranges.	1	2	3	4	5	6	7
(24) Jelly.	1	2	3	4	5	6	7
(25) Your favorite soup.	1	2	3	4	5	6	7

Olfactory Imagery

Think of smelling each of the following, considering carefully the image which comes to your mind's nose and classify the images suggested by each of the following questions as indicated by degrees of clearness and vividness on the following scales.

Perfectly clear and as vivid as the actual experience	1	2	3	4	5	6	7
Very clear and comparable in vividness to the actual experience			Moderately clear and vivid	Not clear or vivid but recognizable	Vague and dim	So vague and dim as to be hardly discernible	No image present at all, you only know that you are thinking of the object
(26) An ill-ventilated room.	1	2	3	4	5	6	7
(26) Cooking cabbage.	1	2	3	4	5	6	7
(28) Roast beef.	1	2	3	4	5	6	7
(29) Fresh paint.	1	2	3	4	5	6	7
(30) New leather.	1	2	3	4	5	6	7

Organic Imagery

Think of each of the following sensations, considering carefully the image which comes before your mind, and classify the images suggested as indicated by degrees of clearness and vividness on the following scales.

Perfectly clear and as vivid as the actual experience	1	2	3	4	5	6	7
Very clear and comparable in vividness to the actual experience	Moderately clear and vivid	Not clear or vivid but recognizable	Vague and dim	So vague and dim as to be hardly discernible	No image present at all, you only know that you are thinking of the object		
(31) Fatigue.							
	1	2	3	4	5	6	7
(32) Hunger.							
	1	2	3	4	5	6	7
(33) A sore throat.							
	1	2	3	4	5	6	7
(34) Drowsiness.							
	1	2	3	4	5	6	7
(35) Repletion (as from a very full meal).							
	1	2	3	4	5	6	7

Appendix 5. Self Regulatory Focus Questionnaire (SRF)

This set of questions asks you about specific events in your life. Please indicate your answer to each question by circling the appropriate numbers.

1. Compared to most people, are you typically unable to get what you want out of life?

1	2	3	4	5
never or seldom		sometimes		very often

2. Growing up, would you ever "cross the line" by doing things that your parents would not tolerate?

1	2	3	4	5
never or seldom		sometimes		very often

3. How often have you accomplished things that got you "psyched" to work even harder?

1	2	3	4	5
never or seldom		sometimes		very often

4. Did you get on your parents' nerves often when you were growing up?

1	2	3	4	5
never or seldom		sometimes		very often

5. How often did you obey rules and regulations that were established by your parents?

1	2	3	4	5
never or seldom		sometimes		very often

6. Growing up, did you ever act in ways that your parents thought were objectionable?

1	2	3	4	5
never or seldom		sometimes		very often

7. Do you often do well at different things that you try?

1	2	3	4	5
never or seldom		sometimes		very often

8. Not being careful enough has gotten me into trouble at times.

1	2	3	4	5
never or seldom		sometimes		very often

9. When it comes to achieving things that are important to me, I find that I don't perform as well as I ideally would like to do.

1	2	3	4	5
never true		sometimes true		very often true

10. I feel like I have made progress toward being successful in my life.

1	2	3	4	5
certainly false				certainly true

11. I have found very few hobbies or activities in my life that capture my interest or motivate me to put effort into them.

1	2	3	4	5
certainly false				certainly true

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