# Vividness Can Undermine or Enhance Message Processing: The Moderating Role of Vividness Congruency

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*Previous research on the subject of vividness effects in persuasion has yielded conflicting outcomes that are difficult to interpret. The authors outline a theoretical position that anticipates conditions under which vivid message presentations can either enhance or inhibit message processing and persuasion. The key moderator is vividness congruency, which is defined as the extent to which the vivid elements of a message are congruent with the theme of the message itself. Two experiments were conducted that suggest that this previously unexamined variable is an important moderator of vividness effects. Experiment 1 demonstrated that vividness effects on message recall are contingent on the congruency between message content and vivid elements. Experiment 2 showed that message processing (indexed via an argument quality manipulation) can be reduced by adding vivid but incongruent images to a message, relative to pallid messages. Theoretical and applied implications are discussed.*

Vivid communication has long been assumed to have special persuasive properties. Nisbett and Ross (1980) built a theoretical case for the advantages of vividly presented information in enhancing memory and persuasion, arguing that "people's inferences and behavior are . . . more influenced by vivid, concrete information than by pallid and abstract propositions" (p. 44). They suggested several mediating mechanisms that might produce a vividness effect, such as increased availability of vivid information in memory, greater attention to and elaboration of vividly presented information, and greater rehearsal of vivid material. Although some evidence supports the hypothesized memorial advantage of vivid information (e.g., Collins, Taylor, Wood, & Thompson, 1988; Paivio, 1969), subsequent research generally failed to support the notion that vivid information is more persuasive than pallid information (see Taylor & Thompson, 1982, for a review). A host of explanations have been provided for the failure to verify a general vividness effect.[1]

For example, it has been suggested that failures to confirm the vividness effect represent weak operationalizations of vividness (Sherer & Rogers, 1984). Indeed, many of the studies reviewed by Taylor and Thompson (1982) manipulated vividness in questionable ways, such as via audiovisual versus print message presentations. Further support for the weak manipulations perspective is that the majority of vividness studies have not included a manipulation check (Bone & Ellen, 1990). Even if manipulation checks indicated a successful operationalization of vividness, it could still be argued that the manipulation was too weak to yield persuasive differences; therefore, this perspective usually cannot be entirely refuted as an explanation for null vividness findings. However, this perspective has difficulty accounting for studies finding vivid messages to be significantly less persuasive than their pallid counterparts (e.g., Frey & Eagly, 1993; Kiselius & Sternthal, 1984). If vivid messages are more persuasive in general, then weak manipulations should only steer the vividness effect toward null outcomes but should not reverse it.

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A second perspective holds that vividness effects only emerge under conditions in which attention is divided among competing stimuli and that most empirical failures to demonstrate the effect are the result of a failure to create such conditions. It is argued (e.g., Taylor & Thompson, 1982) that vividly presented messages are more likely to capture attention than are pallid messages in real-world settings where many stimuli compete for an individual's attention; however, in most lab situations there is no attentional competition. Participants are given vivid or pallid messages (or both), no other stimuli are presented to them, and they are aware that they are expected to focus their attention on the messages.

A recent set of studies by Frey and Eagly (1993) attempted to test this perspective. Participants were presented with vivid or pallid audio messages in either a free-attention (participants could attend to whatever they wished) or directed-attention condition (participants knew they were expected to pay attention to the message). Contrary to the attention-capture hypothesis, the vivid message was actually less persuasive than the pallid message under free-attention conditions. This finding was replicated in a second experiment, to the surprise of the researchers, who had anticipated that vividness would enhance persuasion under these specific conditions. Frey and Eagly (1993) interpreted their findings by suggesting that vivid presentations elicit high amounts of elaborate imagery that may be tangential or even irrelevant to the message itself, thus undermining message processing. This explanation seems plausible but has difficulty accounting for research that finds vivid messages to produce superior recall (e.g., Collins et al., 1988). The notion that message vividness can undermine the ability to process persuasive argumentation, however, is an important point for the present research. Next, we provide a brief introduction to the broader theoretical perspective applied in our research.

### *The Dual Process Approach*

The present research applies the logic of the dual process theories of persuasion to the vividness literature. Both the elaboration likelihood model (ELM) (Petty & Cacioppo, 1986) and the heuristic-systematic model (HSM) (Chaiken, Liberman, & Eagly, 1989) propose that any variable can affect persuasion either by functioning as a simple cue or by influencing the extent of information-processing activity. The focus of the present research is on the latter process.

Both models work from the assumption that people want to form correct (i.e., functional) attitudes but assume that there are a variety of ways in which attitudes can be formed. The most effortful procedure involves drawing on prior experience and knowledge to carefully scrutinize and elaborate the issue-relevant arguments in a communication, which is referred to as central route or systematic processing. Often, an individual will lack either the motivation or the ability to engage in effortful processing of a message and will rely instead on less thoughtful processes, such as simple inferences. It is assumed that motivation and ability to systematically process messages vary along a continuum and that any variable that can influence either motivation or ability to carefully scrutinize a message can alter the extent of systematic processing. There are some fairly strong reasons to expect message vividness to impact on motivation to process, ability to process, or both.

### *Vividness Can Enhance Message Processing*

The theoretical position for expecting vivid presentations to promote persuasion has typically been based on the assumption that it is possible for a vivid presentation to attract more attention than a pallid presentation and hence increase the extent to which the message is scrutinized (e.g., Frey & Eagly, 1993; Nisbett & Ross, 1980). Thus, this perspective implies an effect on the motivation to process a message: Vivid presentations attract attention and increase motivation to process a message. It is also possible that a vivid presentation can create mental images that are easily retrieved and interact with message content to facilitate processing and retention of both the images and the message arguments. A parallel can be drawn to research on semantic recall, which finds that thinking of interactive relationships between two images facilitates memory for both (e.g., Bergfeld, Choate, & Kroll, 1982; Bower, 1970; Collyer, Jonides, & Bevan, 1974; Nappe & Wollen, 1973). This effect may occur because the vivid elements prime relevant information in memory; if relevant information is primed, message processing is facilitated (Sherman, Mackie, & Driscoll, 1990). Thus, vivid presentations may increase the ability of a message recipient to process a message.

### *Vividness Can Undermine Message Processing*

It is also possible for a vivid presentation to inhibit the extent to which participants systematically process a message. As suggested by Frey and Eagly (1993), vivid presentations may elicit high amounts of elaborate imagery that may be tangential or even irrelevant to the message itself. By occupying the individual's working memory with information that is irrelevant to the message, a vivid message would make it more difficult for the individual to process and remember the message arguments. Thus, vivid elements can reduce the ability to process a message—that is, if the images and thoughts brought to mind are irrelevant. Vivid elements also might undermine motivation to process a message if they elicit images that are revolting, disturbing, or perhaps nonsensical to the individual. Some people may find the images unpleasant enough

that they are no longer willing to think about the message.

### *A Potential Moderating Variable: Imagery Congruency*

The extent to which the imagery elicited by the vivid message is congruent or incongruent with the message (or the degree of interactiveness between imagery and message content) may determine whether the vividness increases or decreases message processing. Highly congruent imagery should have a facilitative effect on message processing because it can both grab attention and prime relevant information stored in memory, whereas message-incongruent imagery is likely to undermine message processing by priming thoughts that are irrelevant to the message content or by undermining motivation to think about message content.

Our view is that vividness congruency has the potential to account for some of the variation in observed vividness effects. We do not suggest vividness congruency as the only important variable in predicting the effects of vividness in persuasion; there are probably many important moderator variables. Nevertheless, it seems useful to illustrate our logic by using some existing data. Applying our reasoning to the research by Frey and Eagly, who published the full text of their persuasive messages, it seems plausible that they achieved a vividness disruption effect because of the particular images their messages elicited. For example, one argument (in a message arguing that airlines should not publicize terrorist threats) stated that publicizing the threats would give the terrorists what they wanted. The vivid version of this message argued that publicizing the threats would give "these foaming martyrs" what they wanted. To the extent that the message recipients conjure up a vivid image of such a person, it seems probable that they imagine this foaming martyr as a real threat to their safety. Indeed, a martyr is someone who is presumably willing to die for a cause, and if he or she is willing to die, then he or she is certainly willing to kill innocent airline passengers, too. Therefore, the imagery in this case appears incongruent with the message theme that terrorist threats should not be publicized. If there is a foaming martyr out there threatening your flight, you probably want to know about it, and conjuring up such an image may work against the message's position that you should not know about it.

### *Experiment 1 Hypotheses*

We reasoned that vivid images could be created that were more congruent with the message and then contrasted experimentally with relatively incongruent imagery. Following past research (e.g., Challis, Velichovsky, & Craik, 1996; Frey & Eagly, 1993), we assumed that higher levels of message processing would be indicated by superior recall of message arguments. We anticipated that argument recall would be greatest in conditions where congruent imagery was employed and reduced (compared to a pallid control condition) when incongruent imagery was used.

## EXPERIMENT 1

### *Method*

#### *PARTICIPANTS AND DESIGN*

Participants ($N = 45$) in this study were college student volunteers who read health messages encouraging them to avoid cigarettes, alcohol, and excessive weight gain. The messages were presented in one of three formats. One message was pallid, containing only the principal arguments with little or no embellishment. The remaining two messages were vivid but differed in the extent to which the intended images were consistent with the message theme; one was vivid and thematically congruent, whereas one was vivid and thematically incongruent. We anticipated that vivid-congruent messages would be more thoroughly processed and hence better recalled. Recall measures have been used extensively as indicators of cognitive processing by researchers in social psychology (e.g., Hafer, Reynolds, & Obertynski, 1996), cognitive psychology (e.g., Fabiani & Donchin, 1995), and marketing (e.g., Malaviya, Kiselius, & Sternthal, 1996). We further expected the vivid-incongruent message to undermine argument recall because of its assumed tendency to elicit distracting imagery.

### *Procedure*

To manipulate vividness congruency, we pretested sets of messages on 23 pilot participants and assessed the images they reported. A student assistant unaware of the research hypothesis was asked to rate each image listed as either consistent, inconsistent, or neutral relative to the notion that smoking, drinking, and overeating are bad for your health. Results indicated that the manipulation of vividness congruency was successful; the congruent version elicited more consistent images ($M = 2.82$) than did the incongruent version ($M = 1.00$), $F(1, 21) = 15.54$, $p < .01$, but the incongruent version elicited more neutral images ($M = 2.00$) than the congruent version ($M = 0.91$), $F(1, 21) = 16.10$, $p < .01$. The message versions did not differ in the number of elicited images that were rated as incongruent ($M$s = 0.82 for congruent condition, 0.92 for incongruent condition), $F(1, 21) < 1$. Although this result suggests that incongruent is perhaps a misleading label for the second message, it elicited less congruent imagery than the congruent version without eliciting less imagery. The total number of images elicited by the two vivid versions did not differ in

our pretest, $F(1, 21) = 1.41$, $p > .25$, and hence, they met our needs for the present study.

We also created a pallid version with the same arguments that were used in the two vivid messages, which appear in Appendix A. To illustrate the manipulation, one argument concerned the effects of alcohol consumption on the likelihood of accidents. The pallid version simply noted that alcohol reduces reaction time, increasing the chances of an accident. The vivid-congruent version stated that the slowed reaction time could result in "bloody, bone-crushing accidents." The vivid-incongruent version noted that reaction time would be slowed "to a snail's pace." The image of a bloody accident was deemed congruent with the notion that alcohol is a danger to one's health, whereas the image of a snail is largely irrelevant (and potentially distracting).

Participants were informed on arrival that the study involved the influence of personality on message evaluation. After obtaining consent, they were given one of three printed messages to read. After reading the message, they were allotted a 3-minute interval to complete unrelated filler items and then asked to try to recall as many message arguments as possible and list them on a separate page. After the recall task, participants rated the vividness of the message on a 9-point scale ranging from *not at all vivid* (1) to *extremely vivid* (9). They were then fully debriefed, thanked for their participation, and excused.

## RESULTS

### *Manipulation Check*

A one-way ANOVA was performed on participants' ratings of message vividness. This analysis indicated that our vividness manipulation was successful; the vividness main effect was significant, $F(2, 40) = 5.75$, $p < .01$. Follow-up comparisons showed that this effect was attributable to ratings of the pallid message, which were lower ($M = 6.40$) than the ratings for the vivid-incongruent ($M = 7.93$) and vivid-congruent messages ($M = 8.07$); the vivid versions did not differ on this item (using the Bonferroni comparison method and a significance level of .05 for all tests).

### *Argument Recall*

Two raters independently coded the free-recall responses. Their ratings were highly consistent ($r = .96$) and, hence, were averaged to form a single index. A one-way ANOVA on this free-recall index revealed a main effect of vividness, $F(2, 40) = 4.56$, $p < .05$. Examination of cell means (see Table 1) showed that participants reading the vivid-congruent version produced significantly superior recall of the message arguments compared to the vivid-incongruent and pallid conditions.

**TABLE 1: Mean Argument Recall by Vividness Condition**

| | *Vividness Condition* | | |
|---|---|---|---|
| | *Pallid* (N = *14*) | *Vivid Incongruent* (N = *14*) | *Vivid Congruent* (N = *15*) |
| All participants | $4.17_a$ (2.30) | $4.18_a$ (2.09) | $6.46_b$ (2.57) |

NOTE: The table contains data from Experiment 1. Standard deviations are in parentheses. Means without shared subscripts differ at the $p < .05$ significance level, based on Bonferroni comparisons.

## DISCUSSION

The results of Experiment 1 are important for two reasons. First, we replicated the finding of many previous studies that vivid presentations (i.e., the vivid-incongruent message) can produce results that are no different than pallid comparison messages (cf. Taylor & Thompson, 1982). Second, unlike most previous investigations, we found that vivid messages (i.e., the vivid-congruent messages) can enhance message processing relative to a pallid control message, as indicated by increased message recall. Of importance, both the null effect and the enhancement effect of vividness were found in the same study, and the vividness enhancement effect was anticipated by our theoretical position. Of course, the messages in our study were not identical, and it is possible that some difference other than vividness congruency is responsible for the observed memory differences. For this reason alone, a replication using different operationalizations would be desirable.

Another limitation of Experiment 1 is that we were unable to replicate the vividness disruption effect reported by Frey and Eagly (1993). One potentially important difference between our design and theirs that provides a possible explanation for this failure to replicate is a difference in message topics. Whereas we used a health message, Frey and Eagly used messages on airline terrorism and private schooling. It is possible that several of our arguments were so familiar to our audience as to make it unlikely that many participants would fail to recall at least three or four of the arguments. Perhaps a less familiar set of arguments (such as arguments on why terrorist threats should not be reported to the general public—the focus of one of Frey and Eagly's messages) would provide a better opportunity to observe the disruption effect.

Of importance, the disruptive effect of vividness on message processing in Frey and Eagly's (1993) work was not apparent under conditions of high attentional constraint, which consisted of presenting the message and

instructing participants to pay careful attention to the message. One reason why we would not expect vividness to have parallel effects under such conditions is that all participants are more motivated to process the message if they are told by the experimenters to "pay careful attention"; hence, there is little chance for any variable to increase the extent of message processing. Our participants were not asked to pay careful attention to the message; however, it was suggested to them that message impressions were a main focus of the study, so it is conceivable that processing motivation was constrained enough overall to eliminate the disruption effect.

However, attention may not have been equally constrained for all of our participants. The same logic that suggests that situational factors can produce attentional constraint also can be applied to individual difference factors. People who are chronically motivated to process messages, regardless of whether they are explicitly told to do so, should be relatively immune to processing enhancement effects because they are already processing at such a high level (e.g., Smith & Petty, 1996). The individual difference variable, need for cognition (Cacioppo & Petty, 1982), reflects the extent to which people are intrinsically motivated to engage in effortful cognitive activity and has been used as a proxy measure of chronic tendencies to systematically process information (see Cacioppo, Petty, Feinstein, & Jarvis, 1996, for a review).

Our first experiment followed past vividness research and employed a recall measure of processing. As suggested by Frey and Eagly (1993), an alternative method for testing the effects of vividness on message processing is to vary the quality of message arguments, creating strong and weak versions of a message arguing for a particular position. Using this method, increased central route (or systematic) message processing is inferred from increased differentiation between weak and strong argument versions on attitudinal indexes. This increased differentiation occurs because higher levels of processing should enhance agreement with strong arguments but undermine agreement with weak arguments. We used this argument quality approach to gauging message processing in our second experiment.

Our second experiment again attempted to demonstrate that vivid presentations can either enhance or undermine systematic processing. In this follow-up study, we defined processing as the extent of differentiation between weak and strong message arguments. By using one of the message topics employed by Frey and Eagly (1993), we hoped to replicate their findings by showing that vividness can undermine message processing and extend their findings by demonstrating that vividness can enhance message processing.

## EXPERIMENT 2

### *Overview*

The second experiment further tested the notion that vivid presentations can either enhance or undermine the extent of message processing, depending on whether the imagery elicited is congruent or incongruent with the focus of the message arguments. A vivid-congruent and a vivid-incongruent message on the topic of airline terrorism were constructed based on the messages used by Frey and Eagly (1993) on the same topic. Messages were again constructed so that the relative vividness of imagery elicited by the two versions was approximately equivalent. These imagery-eliciting elements were then crossed with two versions of message text that differed in the quality of their argumentation. Half contained what pretesting suggested to be strong arguments and half contained relatively weak arguments. Two low-imagery (pallid) control messages (one weak and one strong version) also were employed.

### *Experiment 2 Hypotheses*

We anticipated that, relative to the low-imagery control messages, the high-imagery messages that elicited congruent imagery would produce the greatest amount of attitudinal differentiation between the weak and strong versions. By contrast, the high-imagery messages that elicited message-incongruent imagery were expected to undermine message processing, leading to less differentiation between weak and strong versions than the low-imagery (pallid) messages. Participants' extent of message processing was assumed to be reflected in the degree to which they were differentially persuaded by weak versus strong arguments supporting the message conclusion (see Haugtvedt & Priester, 1997).

We also expected that the above effects of message vividness would be most noticeable among individuals low in their dispositional motivation to carefully process messages, as assessed by the Need for Cognition (NC) scale. We expected that participants high in need for cognition would be relatively immune to the vividness manipulation and highly influenced by argument quality.

## METHOD

### *Participants and Design*

Data were collected from 288 student volunteers enrolled in introductory psychology classes. They received course extra credit for their participation and were randomly assigned to receive one of six versions of a persuasive message resulting from the orthogonal manipulation of vividness (pallid, vivid-congruent, or

vivid-incongruent) and argument quality (weak vs. strong). They also were asked to complete the short form of the NC scale (Cacioppo, Petty, & Kao, 1984); a median split on NC scores created a third independent variable. The resulting design was a 3 (vividness) × 2 (argument quality) × 2 (need for cognition) factorial.

*Procedure*

Participants were informed on arrival that the experiment concerned personality and memory but that it was a short experiment and it would be appreciated if they could spend a few minutes examining some materials being planned for use in an unrelated future study. This cover story provided a plausible excuse to present the persuasive message with no strong demand to respond to it in any particular way or to pay special attention to it.

The messages (see Appendix B) were constructed so as to reflect the two different types of vividness in addition to a pallid control condition. Our messages were based on the airline terrorism theme employed by Frey and Eagly (1993). Pretesting with a separate participant sample had indicated a set of images that were seen as consistent with the notion that airlines should not warn the public of all terrorist threats (e.g., "a zit-faced Bozo" making prank calls); these were infused into the congruent-vividness message. The incongruent-vivid message was essentially the same as the vivid message used by Frey and Eagly, and we also borrowed heavily from their pallid message in constructing our own pallid version. The first three message versions identified above were designed to contain relatively strong, persuasive arguments. A parallel set of messages (i.e., congruent-vivid, incongruent-vivid, pallid) were then constructed using relatively weak arguments. An example of a weak argument was that publicizing the threats might cause panicked passengers to become nauseated and soil the airport carpeting.

After being allotted 1 minute for reading the message, participants were asked to turn to a response sheet that first asked them to indicate their attitude toward the issue of reporting terrorist threats to the public on three scales ranging from *foolish* (1) to *wise* (9), *bad* (1) to *good* (9), and *negative* (1) to *positive* (9). Next, participants were asked to rate how strong they perceived the message arguments to be on a *very weak* (1) to *very strong* (9) scale. A final item asked participants to rate the overall vividness of the message presentation on a scale ranging from *not at all vivid* (1) to *extremely vivid* (9).

The experimenter next announced that the first experiment was complete and it was time for the second experiment, on personality and memory, to begin. It was further explained that the personality measures would precede the memory test; the experimenter then distributed copies of the NC scale (Cacioppo, Petty, & Kao, 1984). A sample item on the 18-item scale is "The idea of thinking is appealing to me." Each item called for a response on a 5-point scale with the end anchors of *strongly disagree* (1) and *strongly agree* (5). Half of the items call for reverse scaling; possible scores range from 18 to 90. Our sample median was 64.

## RESULTS

*Manipulation Checks*

The argument quality manipulation check was submitted to a 3 (vividness condition: pallid vs. vivid-incongruent vs. vivid-congruent) × 2 (argument quality: weak vs. strong) × 2 (need for cognition: high vs. low) ANOVA. This produced several significant outcomes, of which the most relevant was a main effect of argument quality, $F(1, 273) = 25.51$, $p < .01$. As expected, strong arguments elicited higher strength ratings ($M = 5.51$) than did weak arguments ($M = 4.18$). We also observed significant interactions between need for cognition and argument quality and between vividness and argument quality. The Need for Cognition × Argument Quality interaction, $F(1, 273) = 6.06$, $p < .05$, reflected the fact that participants high in need for cognition discriminated more between weak and strong arguments than did those low in need for cognition. The Vividness × Argument Quality interaction, $F(1, 273) = 6.16$, $p < .05$, reflected the fact that the ratings of participants exposed to the vivid-congruent version differentiated between weak and strong arguments to a greater extent than did participants exposed to either the pallid or the vivid-inconsistent versions, interaction contrast: $F(1, 273) = 47.62$, $p < .01$.

An ANOVA on participants' ratings of message vividness also indicated support for the manipulations, yielding a significant effect of vividness condition, $F(2, 270) = 8.25$, $p < .01$.[2]

Comparison tests revealed that, as expected, the pallid message received significantly lower ratings ($M = 4.61$) than the vivid-incongruent and vivid-congruent versions (respective $M$s = 5.66, 5.68). The two vivid versions were not significantly different from each other on this item.

*Attitudes*

The primary dependent measures were participants' responses to the three attitude items.[3] These items were highly correlated ($\alpha = .90$) and, hence, were averaged to form a single attitudinal index. A 3 (vividness condition) × 2 (argument quality) × 2 (need for cognition) ANOVA was performed on this index and revealed several significant effects. First, a significant effect emerged for argument quality, $F(1, 273) = 77.51$, $p < .01$. As expected, strong arguments elicited more favorable attitudes ($M = 5.83$) than did weak arguments ($M = 3.88$). Second, we

**TABLE 2: Mean Attitude Ratings by Vividness Condition and Argument Quality**

| | *Vividness Condition* | | |
|---|---|---|---|
| *Argument Quality* | *Pallid* | *Vivid Incongruent* | *Vivid Congruent* |
| Weak | 3.67 | 4.08 | 3.90 |
| | (1.49) | (1.84) | (1.41) |
| | $N = 47$ | $N = 43$ | $N = 56$ |
| Strong | 5.75 | 5.27 | 6.49 |
| | (1.87) | (1.98) | (1.55) |
| | $N = 50$ | N = 45 | $N = 43$ |
| Difference between weak and strong arguments | $2.08_b$ | $1.19_a$ | $2.59_b$ |

NOTE: The table contains data from Experiment 2. Standard deviations are in parentheses. Higher numbers indicate more favorable promessage attitudes. Difference tests are based on planned interaction contrasts; differences not sharing subscripts differ significantly at $p < .05$.

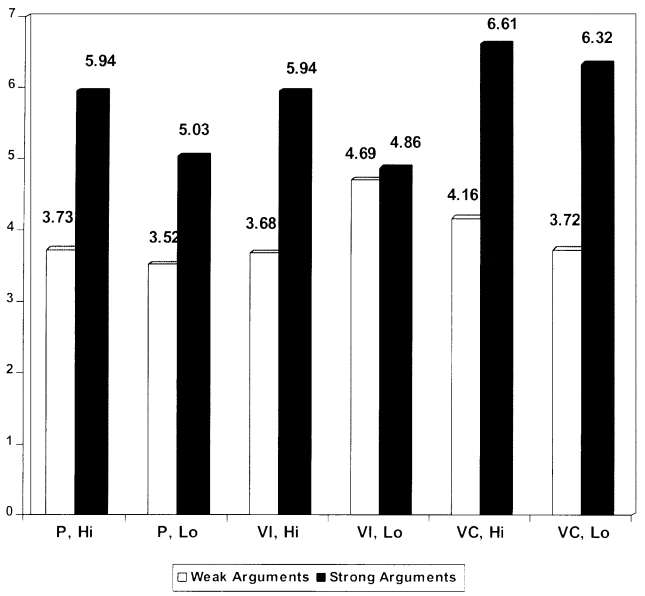


**Figure 1 Attitude ratings as a function of need for cognition, argument quality, and vividness type (Experiment 2).**
NOTE: P = pallid; VI = vivid, incongruent; VC = vivid, congruent; Hi = high need for cognition; Lo = Low need for cognition.

observed an interaction between argument quality and need for cognition, $F(1, 273) = 4.34$, $p < .05$. This interaction suggested that, consistent with past findings (e.g., Haugtvedt, Petty, & Cacioppo, 1992), participants high in need for cognition processed the message more thoroughly than did participants low in need for cognition. Agreement with weak ($M = 3.83$) and strong message versions ($M = 6.14$) was more differentiated for participants high in need for cognition than for participants low in need for cognition ($M$s = 3.93, 5.38, for weak and strong versions, respectively).

More relevant to our hypotheses was the interaction between vividness condition and argument quality, which was significant, $F(2, 273) = 3.37$, $p < .05$. Inspection of cell means (see Table 2) suggests that, as predicted, differentiation between weak and strong message arguments was greater for participants exposed to the vivid-congruent message than for those reading the vivid-incongruent version, interaction contrast: $F(1, 273) = 7.60$, $p < .01$. Although the differences between vivid-congruent and pallid and between vivid-incongruent and pallid were not statistically significant, the differences were clearly in the predicted directions and, as discussed next, the expected patterns were indeed statistically significant when considering only the participants who were less motivated to scrutinize the message.

The most important test of our hypotheses occurred when examining the differences between those low and high in need for cognition. Recall that those high in need for cognition enjoy thinking and typically devote more effort to message processing than those low in need for cognition (cf. Cacioppo & Petty, 1982). We would expect that participants high in need for cognition would differentiate between weak and strong message arguments regardless of the level of vividness they were exposed to, and hence, that participants low in need for cognition would more clearly demonstrate the effects of vividness on message processing. Although the triple interaction involving need for cognition did not reach significance, $F(2, 273) = 2.49$, $p < .09$, further analysis provided support for our hypotheses. Indeed, a 3 (Vividness Condition) × 2 (Argument Quality) ANOVA on the attitudinal responses of participants high in need for cognition revealed only a main effect of argument quality, $F(2, 273) = 72.46$, $p < .01$. The Vividness Condition × Argument Quality interaction did not approach significance, $F(2, 273) < 1$ (see Figure 1).

Participants low in need for cognition, on the other hand, do not chronically seek out opportunities for engaging in effortful thought. As such, they are more likely to respond to factors that tend to enhance processing motivation. A 3 × 2 ANOVA on the attitudes of respondents low in need for cognition revealed two significant effects. First, a main effect of argument quality emerged, $F(2, 273) = 19.13$, $p < .01$. More important, a Vividness Condition × Argument Quality interaction was evident, $F(2, 273) = 5.83$, $p < .01$. Simple effects tests revealed that argument quality did not affect the attitudes of participants low in need for cognition who were exposed to vivid-incongruent messages ($F < 1$) but did influence the attitudes of participants low in need for cognition who were reading the vivid-congruent message, $F = 32.62$, $p < .01$. Furthermore, the argument quality effect in the vivid-incongruent condition was signifi-

cantly lower than the argument quality effect in the pallid condition, interaction contrast: $F(1, 273) = 5.31$, $p < .05$, and the interaction contrast between vivid-congruent and pallid conditions also reached significance, $F(1, 273) = 4.25$, $p < .05$.

## GENERAL DISCUSSION

The results of our second experiment provide further evidence for the proposition that vivid imagery can influence responses to persuasive messages by undermining or enhancing message processing. Participants who read arguments containing imagery incongruent with the message conclusion failed to differentiate between strong and weak arguments in their attitudinal responses to the persuasive messages, whereas participants who read arguments containing vivid imagery congruent with the message conclusion showed the strongest attitudinal differentiation between strong and weak arguments. Of importance, manipulation checks verified that vividness was manipulated successfully, with no differences in the amount of vividness contained in the vivid-congruent and vivid-incongruent versions. Thus, these findings imply that vivid-incongruent imagery can inhibit message processing, whereas vivid-congruent imagery may promote such processing (particularly among participants who are low in need for cognition and are not otherwise motivated to carefully scrutinize persuasive messages). In addition, recall that Experiment 1, which relied on free recall as an index of message processing, showed that message-congruent vivid imagery clearly enhanced systematic processing of message arguments relative to either vivid-incongruent imagery or a pallid version of the same arguments. Although the results of the two studies varied slightly (owing primarily, we believe, to our reliance on different persuasive topics and message-processing indexes), focusing on these minor variations would obscure the most important point: The congruency of vivid elements to the message arguments does make a difference. Our findings suggest that whether this congruency effect is more attributable to the processing-enhancement qualities of the vivid-congruent imagery or the processing-disruptive qualities of the vivid-incongruent imagery may depend on such factors as the audience targeted by the message and the familiarity of the topic to that audience. However, it appears that these two different types of vivid presentations are likely to elicit very different levels of message processing—a point that has been neglected in previous work on the topic of vividness and persuasion.

Our results also tie into previous findings in three other important ways. First, although the vivid-congruent message presentation in Experiment 2 produced reliably more processing than the vivid-incongruent message, this effect was limited to individuals low in need for cognition, suggesting that the effects of vividness on message processing are, as proposed by Frey and Eagly (1993), limited to conditions in which motivation to process is relatively low. It appears that people who are (dispositionally or situationally) motivated to carefully process a message will be minimally affected by the vividness of that message.

Second, the lowest attitudinal differentiation in Experiment 2 between weak and strong argument versions occurred in the incongruent imagery condition, which was the only condition where the argument quality effect failed to reach the .05 significance level. This result also is consistent with past findings on the topic of vividness effects on message processing. Frey and Eagly (1993) found that vivid presentations undermined message processing and, as noted earlier, their vivid messages could plausibly be classified as incongruently vivid. In fact, the vivid-incongruent message we used in Experiment 2 was modeled closely after the vivid airline terrorism message used in Frey and Eagly's work. Thus, our research replicates the vividness-disruption effect on message processing using a different method of assessing processing effects.

Third, some former findings have indicated that vividness clearly enhances persuasion and/or recall (e.g., Herlocker, 1996; Paivio, 1969). Our findings from Experiment 1 provide a replication of this vividness-enhancing effect on message recall, which some scholars had virtually pronounced dead (e.g., Taylor & Thompson, 1982).

A number of theoretical perspectives can account for either null effects of vividness or enhancement effects but not for disruption effects (e.g., Nisbett & Ross, 1980). Still others can account for null effects or disruption effects but not enhancement effects (Frey & Eagly, 1993). The present vividness-congruency model is capable of accounting for all three outcomes by applying the logic of the dual-process approach and assuming that message vividness can influence the likelihood of message processing, which in turn can affect both message recall and message-based persuasion. This is not meant to imply that our model explains all the conflicting findings in the vividness literature. No doubt there are other factors involved that have contributed to the diversity of findings. However, our results make clear that the congruency of vivid information is one of the factors that must be considered when assessing the potential effects of vividness on persuasion.

Vivid messages, in the present scheme, may either enhance or inhibit message processing. The key moderating variable suggested by our account and identified in the present research is the consistency of the vivid message elements with the associated message arguments

and the overall message theme. If these elements are consistent (i.e., they elicit images that lead to favorable conclusions about message validity), then vivid presentations will be every bit as persuasive, often more so, than pallid presentations. If these vivid elements are inconsistent, however, then the use of such presentations likely will at best yield no benefits and can potentially undermine the message's effectiveness. Further research should attempt to identify the mechanisms by which vividness congruency has its impact. Either motivational or ability-related explanations can account for the present data, and it would be helpful to understand which of these processes are driving the observed vividness effects.

These findings can be applied in real persuasion contexts by following two rules. First, message arguments should be pilot tested to be certain that they elicit favorable cognitive responses in the absence of vivid imagery. Second, the vivid elements should be pretested to ensure that the mental images formed by respondents are consistent with the message itself. For example, an ad for safe sex that includes imagery would be far better off if the images elicited were of disease-infected individuals than if the images were of people having sex in a cavalier manner with multiple partners. If the arguments in a message are strong and the message contains vivid elements that illustrate the points one is trying to make, then message recipients will be more likely to think about and remember the message arguments than if a pallid presentation or one containing vivid images that are inconsistent with or irrelevant to the theme of that message was used.

## APPENDIX A
## Messages Used in Experiment 1

*Pallid Version*

Research shows that of all the choices you make regarding your health, the most important ones have to do with smoking, drinking, and weight control.

As far as smoking goes, recent studies indicate that smoking cigarettes diminishes lung capacity. Furthermore, this loss of breathing capability can lead to stress on the heart as well as the depletion of the immune system. Repelled by the smell of cigarette smoke, people become annoyed and withdrawn from the smoker. Recent surveys indicate a decrease in the smoking population due to intolerance of a largely nonsmoking country. Quality of life is better for nonsmokers. Smoking undermines success and happiness in life by adding to sick days, increasing likelihood of hospitalization and treatment. Finally, research has shown that the smoker can harm others through secondhand smoke. Every day, smokers put their family, friends, and coworkers at risk because of their personal habit.

Alcohol use yields a variety of negative outcomes. First, alcohol causes severe liver problems when used over long periods of time. Alcohol also causes bad judgments that have negative repercussions. Finally, alcohol reduces reaction times, which, if driving, causes an increase in the probability of an accident.

How well you manage your weight also is crucial. Research indicates that poor diet and little or no exercise can lead to various heart diseases. The overweight individual experiences an increase in both physical and emotional illness. Furthermore, studies in social psychology have shown that overweight individuals face discrimination in everyday life. They are considered to be "out of control" and physically deteriorating. Finally, through surveys and case studies, researches have found that overweight individuals experience a significantly lower quality of life than do healthy individuals, primarily because of their lessened activity level.

In sum, avoid cigarettes, alcohol, and obesity and the odds are good that you will stay healthy and happy for a very long time.

*Vivid, Congruent Version*

Research shows that of all the choices you make regarding your health, the most important ones have to do with smoking, drinking, and weight control.

As far as smoking goes, recent studies indicate that smoking cigarettes diminishes lung capacity. If you are a smoker, your daily life consists of strenuous climbs from the chow hall to class. You arrive at your destination gasping desperately for air. When the smoker enters any social situation, people can only reel back in disgust from the smoker's putrid odor. The revolting smell of cigarettes acts like a social repellent. The sickened smoker can only lie in bed, pale-faced and sweating for weeks on end, vomiting because of the weakened status of his or her immune system due to smoking. Finally, the smoker punishes loved ones with noxious and poisonous fumes from burning tobacco. Each cancer stick not only damages the smoker but drains the life from friends, family, and loved ones.

Alcohol use yields a variety of negative outcomes. Alcohol leads to disgusting, purple, bloated livers when used over vast eons of time. Alcohol also turns normal, clear-thinking, handsome young adults into poor decision makers. Finally, alcohol slows reaction time to an unsatisfactory rate, creating a high risk of bloody, bone-crushing accidents.

How well you manage your weight also is crucial. Research indicates that poor diet and little or no exercise can lead to various heart diseases. The rotund individual can barely waddle down the street without cringing from heart pains and muscle aches. Furthermore, the entire beach will gawk at the overweight individual pummeling down the beach. The disgusting site of rippling cellulite repels the sunbathers and leaves the individual isolated. Finally, whereas the normal-weight hero bounds up to the mountaintop for a picnic lunch and an incredible view, the robust person, unable to climb two steps, can only listen to the laughter from the bottom.

In sum, avoid cigarettes, alcohol, and obesity and the odds are good that you will stay healthy and happy for a very long time.

*Vivid, Incongruent Version*

Research shows that of all the choices you make regarding your health, the most important ones have to do with smoking, drinking, and weight control.

As far as smoking goes, recent studies indicate that smoking cigarettes diminishes lung capacity. The nonsmoker's lung capacity is so powerful that the individual has the ability to inflate a balloon the size of a cow. The smoker, on the other hand, can only inflate a balloon the meager size of a golf ball. Your smell as a smoker lingers on all of your clothing. You might as well incinerate them in a towering, flaming bonfire because the smell is permanent. The smoker's immune system becomes so damaged that all he or she can do is lounge lazily in front of the television watching reruns of Oprah and sipping ginger ale. Finally, passive smoke in places such as your favorite restaurant can deplete the health of happy patrons feasting on zesty plates of steaming lasagna or munching on garlic bread.

Alcohol use yields a variety of negative outcomes. Alcohol creates mountain-sized liver problems when used decade after decade. Alcohol also turns people into fumbling idiots who can't think their way out of paper bags. Finally, alcohol reduces reaction time to a snail's pace, causing a momentous increase in the probability of an accident.

How well you manage your weight also is crucial. The overweight person, out on yet another sick day, topples over from the journey from the couch to the refrigerator to retrieve his or her double-nut, fudge brownie ice cream and Sara Lee cheesecake. Furthermore, the fat person soon becomes a social outcast and can only adhere himself or herself to the couch on Friday and Saturday nights, peeling himself or herself off to get to the refrigerator for a high-fat, high-calorie treat of fried chicken. Finally, whereas the active, in-shape person prances from charity to charity, helping those in need with time, money, and charisma, the overweight individual can barely pull himself or herself from out of the cozy warmth of his or her bed.

In sum, avoid cigarettes, alcohol, and obesity and the odds are good that you will stay healthy and happy for a very long time.

## APPENDIX B
## Messages Used in Experiment 2

*Introductory Paragraph*[a]

Terrorist threats and acts of violence against airlines are on the rise. The recent bombing of Pan Am Flight 103, in which 258 passengers were killed in a midair explosion over Lockerbie, Scotland, is an example of such ruthless terrorism. This cold-blooded killing of innocent people raises a vital question: Should airlines inform the public of terrorist threats they receive?

*Vivid, Incongruent*

There are a number of good reasons why airlines should not inform the public of terrorist threats. First, if airlines were to publicize every blood-chilling threat, they would be doing exactly what these foaming martyrs want. The terrorists would then increase the number of their threats. Second, trumpeting these fanatical threats with bold headlines and widespread news flashes would just encourage phony bomb threats. Third, even though most threats are idle, people would be hysterically worried about the fluffed-pillow comfort of air travel and would opt for other, pollution-laden methods of travel that are less safe. Countering terrorist threats will simply not be accomplished by warnings to the public.

*Vivid, Congruent*

There are a number of good reasons why airlines should not inform the public of terrorist threats. First, if airlines publicized every hare-brained threat, they would be doing exactly what these bumbling, drooling idiots want. Terrorists would then increase the number of their threats. Second, announcing threats would just encourage more zit-faced bozos to call in phony threats for a cheap thrill. Third, even though most threats are idle, people would be frantically worried about planes plummeting out of the sky and would opt for other, bloody methods of travel that are less safe. Countering terrorist threats will simply not be accomplished by warnings to the public.

*Pallid*

Terrorist threats and acts of violence against airlines are on the rise. In recent years, a number of commercial flights have been targeted by such terrorism. The bombing of one flight resulted in the deaths of many of its passengers. The question that is being raised by many is whether airlines should inform the public of terrorist threats they receive.

There are a number of good reasons why airlines should not inform the public of terrorist threats. First, if airlines were to publicize every incoming threat, they would be doing exactly what these pranksters want. Second, disclosure of these threats would encourage phony threats. Third, even though most threats are idle, people would be worried about air travel and would opt for other methods of travel that are ultimately less safe. Countering terrorist threats will simply not be accomplished by warnings to the public.

NOTE: Only strong argument versions are presented; weak argument versions are available from the authors.

a. This was the same for both vivid versions.

NOTES

1. Vivid information has been defined as information that is "likely to attract and hold our attention and to excite the imagination to the extent that it is (a) emotionally interesting, (b) concrete and imagery-provoking, and (c) proximate in a sensory, temporal, or spatial way" (Nisbett & Ross, 1980, p. 44). The present research focuses on the second component—the extent to which the information is concrete and imagery provoking.

2. Four participants failed to complete this item and were dropped from the analyses.

3. One participant failed to complete one of the three attitude items and was dropped from the analyses.

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