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# Media Impact on Fright Reactions and Belief in UFOs: *The Potential Role of Mental Imagery*<sup>1</sup>

*Given the fact that the content of television and movies can be described as a rapidly changing stream of audio and visual information, it is puzzling that little research in mass communication has focused upon the cognitive processes relating to mental imagery. In this study, the potential role of mental imagery for media effects in two different areas is explored: (a) emotional responses to frightening mass media, and (b) the effects of the media on beliefs in UFOs. The results of the study indicate that individual differences in vividness of mental imagery may play a crucial role in moderating both types of media impact. Implications and suggestions for future research are outlined.*

Most media scholars would agree that the essential character of television and movies can be described in terms of a rapidly changing stream of audio and visual information. It seems obvious that researchers who study media impact should be concerned with how people perceive, store, and retrieve such information, and the role that cognitive processes might play in media effects. Curiously, however, there has been little, if any, investigation among media effects scholars related to the construct of mental imagery, an important area of the cognitive literature (but see Burns, Biswas, & Babin, 1993; Newhagen & Reeves, 1992).

This lack of concern is especially puzzling given the vast literature in psychology that is devoted to various aspects of mental imagery. This literature includes work on mental imagery and the brain (Farah, 1988; Goldenberg, Artner, & Podreka, 1991; Kosslyn, 1991; J. Richardson, 1991), the structural features of the mental imagery system (Morris & Hampson, 1983), the

COMMUNICATION RESEARCH, Vol. 22 No. 1, February 1995 3-23  
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relationship between mental imagery and memory for emotional events (Christianson & Loftus, 1991; Heuer & Reisberg, 1990), and individual differences in mental imagery (Kosslyn, Brunn, Cave, & Wallach, 1984; Miller et al., 1987; Slee, 1980).

One possible reason for the relative neglect of the mental imagery literature by media effects scholars is that much of this research is conducted on stimulus materials that are relatively impoverished and significantly less complex than the varied and rapidly changing stimuli presented in television and film. For example, research by Kosslyn et al. (1984) employs simple line drawings of geometric shapes to study individual differences in imagery ability. One task presented to subjects in this research was to mentally rotate a line drawing and subsequently identify the correct, rotated, configuration of the original figure. The conceptual link between skill at such tasks and the processing of televised images seems remote.

It is important to arrive at some basic theoretical understanding about mental imagery prior to any examination of its role in studies of media impact. Our view of imagery follows the observations made by Finke (1989) and Bower (1972). Mental imagery has been defined as: “. . . [T]he mental invention or recreation of an experience that in at least some respects resembles the experience of actually perceiving an object or event, either in conjunction with or in the absence of, direct sensory stimulation” (Finke, 1989, p. 2). According to Bower (1972, p. 52), “the function of mental imagery is to put us in direct contact with *how* things looked, or sounded, or felt, or tasted.”

Arguments about the underlying codes and representations related to the storage of sensory information in long-term memory are very complicated and have been waged for quite some time with little overall consensus. For example, there is disagreement about whether perceptual and nonperceptual information is stored in common or different formats in memory (see Anderson, 1978; Finke, 1989; Kosslyn, 1975; Marschark & Cornoldi, 1991; Paivio, 1971; Pylyshyn, 1973). For our purposes it is merely necessary to assume that there can be an elaborate and detailed store of sensory/perceptual information in long-term memory whether or not one conceives of this information as stored propositionally or analogically.

It is also important to distinguish between an emphasis on a mental image as a representation in long-term memory from a mental image that is created when it is needed in short term (working) memory (see A. Richardson, 1983). Several researchers have focused on the function of conscious imagery, that is, imagery in working or short-term memory. Some treat mental images as internal stimuli that have a functional role in problem solving (Shepard &

Cooper, 1982) and as having other behavioral or emotional consequences (Horowitz, 1978; White, 1978). There is evidence that imagery and perception seem to function equivalently (Farah, 1988; Shepard and Cooper, 1982). Images and external stimuli can be considered to have some functional equivalence in the sense that they are responded to in the same ways (Morris & Hampson, 1983).

One property of images that is important for our purposes is their level of “vividness.” As Start and Richardson (1964) have noted, a conscious image that is vivid appears to function differently from one that is not vivid. Individual differences in the level of imagery vividness are well documented. One widely used measure of individual differences in mental imagery is the Vividness of Visual Imagery Questionnaire (VVIQ) (Marks, 1972; 1989), a 16-item, self-report measure that purportedly assesses the extent to which individuals experience vivid images. Marks (1972, p.83) defined vividness as “. . . a combination of clarity and liveliness. The more vivid an image, therefore, the closer it approximates an actual percept.”

The primary purpose of this paper is to explore the potential link between media impact and individual differences in the tendency to experience vivid imagery. Two different areas of media impact were selected for this exploration. One of these areas, the impact of frightening mass media, has been a focus of media effects research for the past 10 years. The second area is one that has been investigated recently: the impact of the media on paranormal beliefs. This article explores the potential relevance of individual differences in mental imagery for each of these research areas. Each research area is outlined and some tentative hypotheses are proposed. An experiment that sought evidence on these hypotheses is presented subsequent to this discussion.

The two areas selected for investigation in this study—emotional reactions to frightening media and the impact of media on paranormal beliefs—were chosen because we believed that, in each case, imagery vividness might affect the impact that a media stimulus has on subjects. In one case we were interested in the degree to which individuals reacted in fear (frightening media stimulus); in the other case, we were interested in the extent to which people endorsed beliefs in the objects depicted in the media (belief in UFOs).

## Emotional Effects of Frightening Media

In recent years, a number of studies have been devoted to understanding emotional reactions to frightening mass media. Some of these studies reflect a developmental perspective and report research on children’s responses to scary media (Cantor & Sparks, 1984; Hoffner & Cantor, 1985; Palmer,

Hockett, & Dean, 1983; Sparks, 1986a; Sparks & Cantor, 1986; Wilson, 1989; Wilson & Cantor, 1985). Other studies focus upon the factors that may contribute to either enjoyment or dislike of frightening media (Mundorf, Weaver, & Zillmann, 1989; Sparks, 1986b; Sparks, 1989; Sparks & Spirek, 1988; Tamborini & Stiff, 1987; Tamborini, Stiff, & Heidel, 1990; Tamborini, Stiff, & Zillmann, 1987; Zillmann, 1980; Zillmann, Weaver, Mundorf, & Aust, 1986).

One phenomenon that is commonly reported in the literature on emotional reactions to frightening media is that many individuals report that they occasionally experience very intense fright reactions that last anywhere from minutes to years after initial exposure to the stimulus. Although this theme is common, few studies have examined the phenomenon directly. However, Cantor (1991) and Sparks (1989) have noted that some of the symptoms associated with such fright reactions include sleep disturbances (e.g., bad dreams, nightmares, difficulty going to sleep), or the experience of flashbacks of film images that cause one to avoid particular situations that are reminiscent of the film's content (e.g., not wanting to baby-sit after seeing a film about a baby-sitter who is terrorized). Johnson (1980, p.786) reported that in response to certain films, almost 20% of a random sample of adults "had experienced for at least two days, a 'significant stress reaction' of the type identified by Horowitz (1976) and Lazarus (1966) as constituting a stress response syndrome." In another recent study (Sparks, Spirek, & Hodgson, 1993), 44% of adult respondents indicated that they had "often felt nervous for quite a while after watching a scary show or movie" (p. 469). Moreover, 43% of the sample said that they "sometimes experience trouble getting to sleep after watching a scary show or movie," and 51% of the sample reported that they have sometimes been so scared by a show or movie that they "have actually been afraid to go into certain rooms in their house." In discussing these results, the authors of this study argued that such intense emotional reactions need to be understood more fully.

### Imagery and Lingering Fright Reactions to Mass Media

One idea that guides the present investigation is that individual differences in mental imagery may also play a role in the experience of lingering fright reactions to mass media. That is, it may be that individuals who experience high levels of vividness in their mental imagery may be more likely to suffer from the lingering negative emotions that many report after watching frightening media presentations. Some data collected from informal interviews (Sparks, 1993, unpublished research) suggest that a person's desire to

either view or avoid frightening films may be related to a tendency to experience images vividly. For example, in describing her relative invulnerability, and her husband's extreme sensitivity to frightening movies, one woman noted that immediately after such a movie, she tended to forget all of the images. Her husband, in contrast, who tended to remember visual details of any type for long periods of time, remained troubled by film images for days and weeks after exposure. The woman noted that these contrasting tendencies produced entertainment desires that were incompatible with those of her husband. Of particular interest in this anecdotal report is the explicit connection made by the respondent between the vividness of the after-film images and the experience of postviewing emotional distress.

What factors may underlie the possibility that individuals high in mental imagery may be more likely to suffer lingering fright reactions to media? First, it is important to note that fright reactions to media stimuli occur as a function of the individual's tendency to perceive the depicted events as a personal threat to their sense of well-being. This perceptual tendency is more likely when the depicted threatening events are felt to be real or possible in the real world. This view is consistent with Frijda's (1988, p. 352) third law of emotion: "the law of apparent reality." Frijda would argue that the magnitude of one's fright reaction to a media stimulus should vary as a function of the degree to which the media stimulus is perceived as real.

According to our view of imagery articulated earlier, if viewing a film is enough to induce a fright reaction, then the experience of postviewing *images* of the film's content is also likely to induce fright. That is, our view suggests that, in general, imagery may function very similarly to actual perceptions. Consistent with this view, Wilson and Barber (1983) note that in a study of fantasy-prone subjects, people "... react to their memories and fantasies with feelings and emotions that would be appropriate if what they were remembering and fantasizing were actually occurring in the present space and time" (p. 352). Interestingly, some of Wilson and Barber's subjects reported that their vivid fantasies were "like a really good movie" (p. 352). Almost by definition, the more vivid a mental image, the more the mental image is like an actual perception. Therefore, the magnitude of fright experienced as a result of post-viewing mental images from a scary movie should be greater if the mental images are particularly vivid. There is some direct evidence that variation in vividness of mental images can produce variation in affective responses, with more vivid images having a different effect than less vivid images. In one study, vividness of mental images of food was related to subjects' ability to increase or decrease salivation (White, 1978).

Up to this point, we have emphasized the *function* of the *conscious* experience of mental images. We have proposed that a vivid image (with its perceptlike quality) is more likely to stimulate the responses normally associated with an actual media experience than a less vivid or less perceptlike image would. As stated earlier, conscious mental images are assumed to be constructed from sensory information that is stored in long-term memory (Kosslyn, 1980). We turn now from an emphasis on conscious imagery as *causal* in terms of its effects on fear responses to a discussion of the importance of the ability to form vivid images on ability to recall media stimulus material. Several imagery studies document a relationship between vivid imagery and memory. Findings from studies by Delaney (1978), Finke (1980), Finke & Kosslyn (1980), Gur & Hilgaard (1975), and Marks (1973), all converge around the fact that individuals who are high vivid imagers consistently outperform low vivid imagers on recall tasks for information about the physical appearance of objects. We suggest that the vivid imagery ability helps with the encoding of sensory data, thereby making them more easily recalled (see Paivio, 1971).

The potential application of this body of research to studies on media fright reactions should be clear. If individuals who are high on vivid imagery are more likely to remember concrete details of the various scenes and characters from a frightening movie, then it might be expected that in the days and weeks following movie exposure, these same individuals may also be more likely to experience the emotional upset associated with thinking about the movie.

Another important point is suggested and confirmed by Swann and Miller (1982). People with vivid mental imagery may remember nonsensory/perceptual details of a situation because of their "facility in using visual stimuli in encoding and/or retrieving factual information" (Swan & Miller, 1982, p. 477). In one study vivid imagers were more accurate in remembering details from an interview about a woman's background, preferences, and attitudes (Swann & Miller, 1982). Evidence was provided demonstrating that this effect was not just due to other individual differences such as intelligence. Possibly, people with more vivid imagery, after exposure to a media stimulus, may remember more of the frightening conceptual details of the stimulus along with basic sensory information.

In summary we suggest three points (not necessarily contradictory) in theorizing how vivid mental imagery might relate to lingering fear responses: (a) A conscious mental image affects responses similarly to the way in which a perception would. The conscious mental image, according to this view, is

causal, that is, the image is an internal stimulus functioning in some ways like an external stimulus would. (b) Those with vivid imagery ability have more detailed sensory information available in long-term memory to be recalled and potentially scared by; and (c) those with vivid imagery ability have better retrieval cues to access other nonsensory information that, when recalled, may also contribute to fear. It is important to note that in the first study we report, we do not attempt to distinguish among these ideas. We suggest the possibility of all three processes contributing to lingering fear responses.

Given this theoretical analysis, the following hypothesis was tested:

*Hypothesis 1:* Individuals who tend to experience high levels of vividness in their mental imagery will be more likely to experience lingering fright reactions to mass media than will those who tend to experience low levels of vividness.

## Imagery and Media Impact on Paranormal Beliefs

Differences in mental imagery may also be relevant to the potential impact of the media on paranormal beliefs. Unlike the research on frightening media, studies of media impact on paranormal beliefs are scarce. In one study (Sparks, Hansen, & Shah, 1994), an experiment revealed that the presentation of a disclaimer before an episode of *Beyond Reality* (a 30-minute drama on the USA network), significantly reduced the tendency for viewers to endorse beliefs in the paranormal events that were depicted in the program. Because beliefs in unsubstantiated paranormal claims are so widespread (Gallup & Newport, 1991), and the media are often blamed for this state of affairs (Feder, 1984; Kurtz, 1985; Randi, 1992), it seems important to understand precisely what role the media may play in encouraging viewers to accept paranormal claims.

One type of paranormal claim that receives regular attention in the media involves the existence of unidentified flying objects (UFOs), which are usually assumed to be from outer space. Often, when the media covers accounts of UFOs, visual simulations of the various flying saucers are presented. This practice raises two interesting questions that the present study sought to investigate. First, will individual differences in vivid mental imagery have any impact on the believability that viewers ascribe to UFO accounts in which visual simulations that are added to create realism are either present or absent? Second, do these visual simulations of flying saucers make it more likely in general that viewers will find the accounts believable?

Existing theories that might address these questions suggest competing hypotheses. In response to a program that contains UFO simulations that have been added to create realism to an account, viewers high in vivid imagery might find it easier than viewers who are low in vivid imagery to retain the visual images of UFOs, and these images will be more perceptlike for the high imagers than the lows. This "information retention" hypothesis follows directly from the theoretical analysis suggested for the earlier hypothesis about lingering fright.

How should these more retainable and more perceptlike images of UFOs affect judgments about the reality of UFOs? According to Shedler and Manis (1986, p. 35), "vivid information may have a disproportionate influence on human judgment because it evokes a rich associative network, which (in turn) is readily available when judgments are made." Emphasizing this same idea, Nisbett and Ross (1980, p. 45) noted that ". . . firsthand, sensory information, and even secondhand information, if it is concrete and imagery provoking, will have more effect on inferences that occur at some temporal remove than more pallid and abstract information will have."

If this view is correct, then we would expect that regardless of one's level of vivid imagery, there should be a tendency for viewers who saw the program with UFO simulations to endorse UFO beliefs more than viewers who saw no simulations. Moreover, after viewing a program containing UFO simulations, high vivid imagers, who have even more rich and vivid information about UFOs available to them, would tend to endorse beliefs in UFOs more than the low vivid imagers. This expectation is due to the fact that the presence of the UFOs should generally result in more vivid images to draw upon in making judgments after the program is over. This view does not predict differences between high and low vivid imagers who viewed a program containing no UFO simulations.

An alternative "image construction" hypothesis also seems plausible. Drawing upon the research by Ernest (1977), Morris and Hampson (1983) noted that ". . . high imagers surpass low in the identification of fragmented words and pictures" (p. 101). Apparently, high imagers are able to better visualize the missing information and fill it in so that the entire image or word can be more easily identified. In the case in which UFO simulations are absent from a program about UFO accounts, high vivid imagers might have a superior ability to fill them in.

More specifically, in contrast to the information retention hypothesis, the difference between high vivid imagers and low vivid imagers might emerge in a situation in which the program to be viewed did not contain UFO simulations that are added to create realism. That is, it may be that high

vivid imagers in such a viewing condition would rely upon their heightened imagery abilities and retain images of UFOs that are more vivid and percept-like than those retained by the low vivid imagers who viewed the same program. For a program that contained UFO simulations, it may be that high and low vivid imagers, having access to the same media stimulus, would tend to be similar in the UFO images retained after exposure. This can be thought of as a sort of “ceiling effect”. That is, in the context of the presentation of stimuli that are concrete and inherently quite vivid, with responses asked for soon after exposure, those with high levels of vivid imagery would not retain a significant advantage over those with low levels.

Following the earlier logic about the influence of images on judgments, the more vivid and perceptlike images of UFOs experienced by the high vivid imagers who viewed a program with no UFO simulations may tend to make the claims associated with such a program more believable. The two alternative theoretical positions presented above lead to a research question that was examined in the following study: Will the presence or absence of UFOs in a video about UFO reports have a differential effect on UFO beliefs among high and low vivid mental imagers?

## Method

### *Participants*

Students enrolled in an introductory communication class at a large mid-western university were recruited for the study. All were female volunteers ( $N = 63$ ) who participated to fulfill a course research requirement.<sup>2</sup> Participation in the study was one of several ways in which this requirement could be met.

### *Equipment*

The television program was played on a Panasonic Omnivision, VHS-format VCR (model #PV-4114). The program was viewed on a Sharp, 25-in. color monitor (model #25MT17) at a distance of 5 feet.

### *Procedure*

The initial phase of the study called for participants to complete a preliminary questionnaire during class. This questionnaire was designed to collect data pertinent to Hypothesis 1, as well as to disguise the purpose of the

laboratory phase of the investigation. In addition to a number of irrelevant items that asked about how frequently the respondents engaged in a variety of activities during a typical month, each respondent was encouraged to indicate the title of a movie or television program that "scared or frightened you more than any other that you have seen." Following their identification of this title, respondents indicated the extent to which they agreed or disagreed with a number of statements about their emotional reaction to the movie or show. These items served as a measure of lingering emotional reactions and were used to test Hypothesis 1.

Over the 2-week period following completion of the initial questionnaire, participants signed up for the laboratory phase of the investigation. Following the 2-week sign-up period, participants reported to the laboratory at their assigned time and signed an informed consent statement. Participants were run through the laboratory phase of the study in groups that ranged from two to five. Upon arriving at the laboratory, participants were instructed to sit in one of five desks that were separated by visual barriers to prevent any interaction during the session. Each participant read and signed an informed consent statement, which explained that the investigators were interested in their reactions to different types of media content. Participants were instructed to relax and enjoy the television program and the commercials that they were about to see, but to be sure not to interact with each other during the program. Commercials were mentioned in an attempt to disguise the true purpose of the experiment. Observations through a one-way window indicated that no interaction took place between any of the participants.

During each viewing session, participants watched one of two different videotapes that had been randomly assigned to the various viewing sessions prior to the arrival of the participants. In one of the conditions, participants viewed a 20-minute segment from the program, *Unsolved Mysteries*, including the commercial messages as they were originally broadcast. This segment featured a summary of various UFO reports that had received wide publicity over the years, including one report of a saucer crash in the desert of New Mexico. The main portion of the segment focused on a series of UFO sightings in Virginia. As these accounts were narrated, dramatic reenactments of the events were depicted. These reenactments contained dramatic special effects that included shots of flying saucers and, in the case of the saucer crash in New Mexico, shots of space aliens being loaded into an ambulance.

In the second video condition, the participants viewed the identical video, except the scenes of space aliens and flying saucers were removed. The narration remained unchanged. This editing was accomplished by replacing the scenes of flying saucers with other footage from the same video that

seemed natural, given the events that were being reported. In some cases, certain scenes from the original video were simply extended while the narrator told of the UFO report. The edited video was shown to a sample of adults and, on direct questioning, no one indicated that they had suspected that the tape had been edited in any way. Moreover, in the debriefing that occurred after the experiment, no participant who viewed the edited video voiced any suspicion about the fact that it had been edited.

Following the video, participants were requested to respond to some questions contained in a booklet. The first portion of the questionnaire asked about the various commercials that had appeared in the program. These questions were designed to disguise the true purpose of the investigation. Following these questions, participants responded to 16 different items by indicating the extent to which they agreed or disagreed with various statements about the events that were depicted in the video. They also indicated whether they had ever seen this particular episode of *Unsolved Mysteries* prior to the experiment. Participants also completed the 16-item measure of vivid mental imagery (VVIQ, Marks, 1972) and then were requested to provide their best guess as to the purpose of the study. No one was able to correctly identify the hypotheses under investigation. Finally, participants were fully debriefed and dismissed.<sup>3</sup>

## MEASURES

The VVIQ (Marks, 1973) was used to operationalize vivid mental imagery. This instrument is a 16-item questionnaire that has been shown to be reliable in past studies (test-retest: .74; split-half: .85). Cronbach's alpha for this measure in the present study was .88. For each of the 16 items, an image is summoned to mind by the respondent and rated on a 5-point Scale of Vividness. Each of the items and the rating scale appear in Appendix A.

A measure of *lingering fright response* was constructed by summing the responses to seven different statements about the movie that respondents identified as the one that had frightened them more than any other they had seen. For each statement, respondents indicated the extent of their agreement on a 7-point scale, with 7 = *strong agreement* and 1 = *strong disagreement*. Cronbach's alpha on these six-items was .88. The statements are listed in Appendix B.<sup>4</sup>

Three items that participants responded to after viewing the program formed a measure of the *overall believability* of the events that were depicted. Once again, for each statement, respondents indicated the extent of their

agreement on a 7-point scale, with 7 = *strong agreement*, and 1 = *strong disagreement*. Cronbach's alpha for these three items was .79.

Five items that participants responded to after viewing the program formed a measure of specific beliefs in the existence of flying saucers and space aliens depicted in the program. Responses to these items were also made on 7-point scales as described above. Cronbach's alpha for these items was .70. These items, as well as the ones for overall believability are listed in Appendix C. Means and standard deviations for each of the four major measures used in this study appear in Table 1.

## Results

The first hypothesis predicted that high vivid imagery would be related to reports of lingering fright reactions to mass media. To test this, a Pearson correlation was computed between the 6-item measure of lingering fright response and the VVIQ. The result of this analysis was a significant positive correlation between the measures ( $r = .29, p < .05$ ).

To answer the research question about the potential impact of viewers' imagery on UFO beliefs after watching one of the two versions of the UFO video, a  $2 \times 2$  ANOVA for unequal cell sizes was performed on the measure of overall program believability and the measure of belief in UFOs and space aliens. The first factor in these analyses was level of vivid imagery (high vs. low). Participants were assigned to one of these levels based on their score on the VVIQ. Scores above the median ( $MD = 66$ ) were considered to be high; scores below the median were considered to be low.<sup>5</sup> The second factor was the version of the video (UFOs vs. no UFOs).

For overall program believability, no main effects emerged (tape version:  $F[1, 59] = .37, p = .54$ ; vivid imagery:  $F[1, 59] = 1.12, p = .29$ ). However, a significant interaction effect did emerge between level of vivid imagery and the tape version,  $F(1, 59) = 11.92, p < .001$ ;  $\omega^2 = .16$ . This effect was due to the fact that among the participants who saw the edited version of the tape (no UFOs), high vivid imagers ( $M = 15.47, n = 19$ ) found the program more believable than did low vivid imagers ( $M = 10.62, n = 16$ ). In contrast, among the participants who viewed the unedited version of the tape (with UFOs), high vivid imagers ( $M = 11.11, n = 9$ ) and low vivid imagers ( $M = 13.68, n = 19$ ) did not differ in the extent to which they believed the program. All means were compared using the Scheffé procedure. Table 2 displays the results of this analysis.

For the measure of belief in flying saucers and space aliens, similar results emerged. Once again, there were no significant main effects (tape version:

Table 1  
Means, Standard Deviations, and Cronbach's Alpha for Major Measures

Measure	Mean	SD	Alpha
Vividness of Visual Imagery Questionnaire (VVIQ)	64.6	9.3	.88
Lingering fright responses	22.7	9.6	.88
Believability of program events	13.0	4.4	.79
Belief in flying saucers and space aliens	19.5	5.4	.70

Note:  $N = 63$  for all statistics displayed above.

Table 2  
Cell Means for ANOVAs on Program Credibility and UFO Beliefs

Overall Program Believability	Video Version	
	With UFOs	No UFOs
Low vivid imagers	13.7 <sub>ab</sub>	10.6 <sub>a</sub>
High vivid imagers	11.1 <sub>ab</sub>	15.5 <sub>b</sub>
Belief in Flying Saucers and Space Aliens	Video Version	
	With UFOs	No UFOs
Low vivid imagers	19.8 <sub>ab</sub>	17.1 <sub>a</sub>
High vivid imagers	18.4 <sub>b</sub>	21.9 <sub>b</sub>

Note: Means with no common subscript differ at  $p < .05$  by the Scheffé procedure. Cell sizes are provided in text.

$F[1, 59] = .07, p = .79$ ; vivid imagery:  $F[1, 59] = 1.65, p = .20$ ), but there was a significant interaction between level of vivid imagery and version of the tape,  $F(1, 59) = 5.18, p < .03$ ;  $\omega^2 = .08$ . This effect was due to the fact that among the participants who saw the edited version of the tape (no UFOs), high vivid imagers ( $M = 21.89$ ) expressed more belief in flying saucers than did low vivid imagers ( $M = 17.06$ ). In contrast, among the participants who viewed the unedited version of the tape (with UFOs), high vivid imagers ( $M = 18.44$ ) and low vivid imagers ( $M = 19.78$ ) did not differ in the extent to which they believed in flying saucers. Again, all means were compared using the Scheffé procedure. Table 2 displays the results of this analysis.

## Discussion

The first hypothesis was supported by the fact that scores on the VVIQ were positively correlated with the measure of lingering fright responses to a scary show or movie. Of course, these data are correlational and should be regarded

as merely suggestive of the potential impact of vivid imagery on fright responses. Future research needs to explore this possibility with more rigor and studies need to be designed that permit stronger statements about the causal role that vivid imagery might play in lingering fright responses. One aspect of the methodology employed in this study that might be improved on in future investigations is to control stimulus exposure so that verbal reports of film details could be compared across subjects. In the present study, each participant responded to the questions about lingering fright on the basis of a self-selected movie that was recalled as frightening.

The test of the research question yielded support for the image construction hypothesis rather than the information retention hypothesis. High vivid imagers were more influenced by the program's claims about UFOs when no UFOs were depicted. In contrast, low vivid imagers were not influenced differentially by the two versions of the video. This finding is important because it highlights the potential role that individual differences in mental imagery may have for the study of media effects. More specifically, it shows that the way the media depict paranormal claims may not be trivial in terms of affecting some people's beliefs. The addition of special effects (adding UFOs) to claims about the existence of UFOs did not appear to enhance the overall believability of the story. However, when such visual details were discussed, but not shown, the story was more believable among the individuals with high vivid imagery.

This finding, like the earlier one, must still be regarded as tentative and in need of additional support. Future studies should seek to replicate this effect. More important, future research needs to document direct evidence in favor of the fact that high vivid imagers really did construct their own images of UFOs. In addition, the specific role of such construction on the persuasive process needs careful investigation. On the basis of the present data, the process of image construction is an inference based on a theoretical analysis. The research reported here should also be extended to other subject populations to strengthen ecological validity. The present study was limited to female college students.

The literature in mental imagery might be characterized as anything but neat and tidy at the present time. In one sense, the choice to focus on vividness of mental imagery and to employ the VVIQ in this study was one that ignored many complex issues in the imagery research. There are ongoing debates about the usefulness of the many self-report measures of mental imagery. However, the practical benefit of this choice was to be able to show the possible relationship between mental imagery and the study of media

effects. It is the task of future research to develop this area in a way that brings conceptual precision and clarity to our understanding of mental imagery processes and media effects.

## Conclusion

This study was designed to investigate the role of a new variable in media effects. Evidence in favor of the role of individual differences in vivid mental imagery emerged in two different domains of media impact: lingering fright responses and paranormal beliefs. Hopefully, future studies will be able to build on this one and increase our understanding of how the impact of the mass media may be, in part, a function of individuals' mental imagery.

### *Appendix A*

#### *Vividness of Visual Imagery Questionnaire (VVIQ)(Marks, 1973)*

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##### Rating Scale

- 5 Perfectly clear and as vivid as normal vision
- 4 Clear and reasonably vivid
- 3 Moderately clear and vivid
- 2 Vague and dim
- 1 No image at all, you only "know" that you are thinking of the object

For the first four items, think of some relative or friend whom you frequently see (but who is not with you at present). Rate the following aspects of the picture that comes before your mind's eye:

1. The exact contour of face, head, shoulders and body.
2. Characteristic poses of head, attitudes, of body.
3. The precise carriage, length of step, etc. in walking.
4. The different colors worn in some familiar clothes.

Visualize a rising sun. Consider carefully the picture that comes before your mind's eye:

5. The sun is rising above the horizon into a hazy sky.
6. The sky clears and surrounds the sun with blueness.
7. Clouds. A storm blows up, with flashes of lightning.
8. A rainbow appears.

Think of the front of a shop that you often go to. Consider the picture that comes before your mind's eye.

9. The overall appearance of the shop from the opposite side of the road.
10. A window display including colors, shapes and details of individual items for sale.
11. You are near the entrance. The color, shape and details of the door.
12. You enter the shop and go to the counter. The counter assistant serves you. Money changes hands.

*Appendix A: Continued*

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Finally, think of a country scene that involves trees, mountains and a lake. Consider the picture that comes before your mind's eye.

13. The contours of the landscape.
14. The color and shape of the trees.
15. The color and shape of the lake.
16. A strong wind blows on the trees and on the lake causing waves.

*Appendix B*

*Items Used to Assess Lingering Fright Response*

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1. The movie or program caused me to have unpleasant thoughts several DAYS after I viewed the movie.
  2. The movie or program caused me to have unpleasant thoughts several WEEKS after I viewed the movie.
  3. The movie or program caused me to have unpleasant thoughts several MONTHS after I viewed the movie.
  4. The movie or program caused me to have unpleasant thoughts several YEARS after I viewed the movie.
  5. I can still remember the scary parts of the movie very vividly.
  6. Sometimes, specific scenes from the movie will "pop into my mind" from out of nowhere.
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*Note:* Respondents indicated the extent to which they agreed or disagreed with each item on a 7-point scale (7 = strong agreement and 1 = strong disagreement).

*Appendix C*

*Items Used to Assess Overall Program Believability*

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1. I think that most of the events depicted in this program probably NEVER ACTUALLY HAPPENED.
2. In general, I found little in this program to convince me that flying saucers from outer space have actually visited earth.
3. I found this program to be a pretty convincing argument for the fact that flying saucers from outer space have actually visited our planet.

*Items Used to Assess Belief in Flying Saucers and Space Aliens*

1. I believe that the bodies of space aliens were actually recovered from a flying-saucer crash in the desert of New Mexico.
2. I do not believe that the photos taken by the radio DJ in the parking lot of a shopping mall in Virginia are pictures of flying saucers from outer space.
3. I think the reason that the radio DJ and his friend failed to get pictures of the flying saucer when they were out in their car was because the experience of seeing a UFO was so overwhelming that they simply forgot to photograph it.
4. I believe the children who were in the school bus that was shown on the shopping mall parking lot actually saw flying saucers from outer space.

*Appendix 3: Continued*

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5. The incident reported in this program about a flying saucer crashing in New Mexico was probably nothing more than a weather balloon or something else from our own planet.
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*Note:* Respondents indicated the extent to which they agreed or disagreed with each item on a 7-point scale (7 = strong agreement and 1 = strong disagreement). Items 1 and 2 on the first measure and items 2 and 5 on the second measure were reverse-scored so that belief in flying saucers was associated with high scores.

## Notes

1. An earlier version of this manuscript was the co-winner of the first place paper award in the debut category at the 1994 meeting of the Broadcast Education Association, Las Vegas, Nevada. This study was partially supported by a grant awarded to the first author by the School of Liberal Arts, Purdue University. The authors are grateful for the assistance of Matt Slayton and Brandon Lisinicchia in preparing the experimental videos.

2. Because of the disproportionate number of females enrolled in the class from which participants were recruited, males were not included in the study. Although 102 females participated, the final *n* size for the experimental portion of the study was reduced to 71. This was due to the fact that 31 of the participants viewed a video unrelated to UFOs for another purpose. The questions asked about the UFO video were consequently irrelevant for this group. Of the 71 participants in the experiment, 8 people were dropped from the analysis because they reported that they had seen the video on a prior occasion. The final *N* size for the experiment was 63.

3. All of the procedures used in this investigation received prior approval from a University Human Subjects Committee who rated our participants at "no risk." No participant in the study expressed any regret as a result of participation and no one complained about any aspect of the procedure. Given these things, we are reasonably confident that no aspect of the study placed any of our participants at risk.

4. Although the first four items on this measure appear to progress in a fashion similar to a Guttman scale, the actual measurement procedure we used did not treat these items as a Guttman scale, but as separate items that were each measured and then combined in an additive index. Our assumption was that in reference to a frightening movie that had been recalled from the past, it was reasonable to assume that the experience of immediate fright would be related to the experience of lingering fright. The results confirm that this expectation was a reasonable one.

5. We followed the suggestion of an anonymous reviewer to use all of the information in the measure of imagery and to analyze the data with a multiple regression procedure rather than perform the median split and use ANOVA. The results of this procedure revealed the same interaction effect that emerged with the ANOVA and the data were not curvilinear. Because we preferred to show the interaction effect in a table of means, the ANOVA was chosen for presentation here. The substantive conclusions drawn from the ANOVA were identical to the ones that would be drawn from the regression approach. The reader should note that the labels "high" and "low" used to describe scores on the measure of vivid imagery should not be extrapolated beyond this particular sample of participants.

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