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The effects of forewarning of a threatening event and its successful resolution on children's emotional responses to a televised film sequence

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THE EFFECTS OF FOREWARNING OF A THREATENING EVENT AND ITS SUCCESSFUL RESOLUTION ON CHILDREN'S EMOTIONAL RESPONSES TO A TELEVISED FILM SEQUENCE

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ABSTRACT

THE EFFECTS OF FOREWARNING OF A THREATENING EVENT AND ITS SUCCESSFUL RESOLUTION ON CHILDREN'S EMOTIONAL RESPONSES TO A TELEVISED FILM SEQUENCE

Cynthia Ann Hoffner

Under the Supervision of Professor Joanne Cantor

An experiment examined the influence of two types of prior information on children's emotional responses to a frightening program. Children at two age levels (5-7 and 9-11 years) viewed a program that included a threatening scene and a happy resolution. Before viewing, they heard one of four audiotaped introductions that were created by factorially varying information about the threat (forewarning, no forewarning) and the happy outcome (prior knowledge, no prior knowledge). Children reported on their responses either before or after they viewed the happy ending. Predictions were derived from theory and research on the role of cognitive appraisal in responses to threatening events. It was expected that forewarning of a threat would increase fear before and during the threatening scene, and that prior knowledge of a happy outcome would reduce fear. In addition, based on evidence of developmental differences in working memory capacity and other cognitive capabilities, it was expected that both types of prior information would have a stronger influence on older subjects.

Results indicated that forewarning of the threat increased anticipatory fear and worry, but did not affect emotional responses to the threatening scene. Changes in skin temperature and heart rate were consistent with self-reports. The threat forewarning also reduced younger children's reports of happiness in response to the positive outcome. Prior knowledge of the happy outcome tended to reduce anticipatory fear, as indicated by both self-reports and skin temperature. Happy outcome information also tended to reduced fear during the threatening scene, but this effect was not robust. Prior information had little effect on facial expressions (coded using Izard's Affex coding scheme). The expected developmental differences were not observed for either type of prior information. Children's interpretations of program events, reports of coping strategies, and scores on supplementary measures of cognitive ability were considered in interpreting the results. Reasons for children's enjoyment of the program (with and without the happy ending) were also examined.

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CHAPTER ONE

Introduction

During recent years, children's responses to frightening mass media presentations have been the focus of much research (see Cantor, in press-a, in press-b). Interest in this topic has been motivated partly by concern about the negative effects of scary programs on children. Recent evidence regarding the prevalence and intensity of fright reactions to media presentations indicates that fear reactions are quite common among children, and often endure beyond the viewing situation (e.g., Cantor & Reilly, 1982; Palmer, Hockett, & Dean, 1983; Wilson, Hoffner, & Cantor, 1987; see Cantor, in press-a, for review). Long-term effects frequently mentioned by children include nightmares, sleep disturbances, and regret about having seen a particular program.

Despite the fact that unwanted emotional disturbances often arise from viewing scary programs, many children report that they enjoy scary shows and do not want to be prevented from viewing them. In one study, adolescents who reported experiencing enduring fright reactions liked scary shows as much as their peers who did not report long-term effects (Cantor & Reilly, 1982). Sparks (1986b) found that one-fourth of a sample of children (aged 5 to 11) said that they both enjoyed and disliked scary programs.

Cantor (in press-a: Cantor & Wilson, 1988) points out that the positive relationship between fright reactions and enjoyment presents a problem for adults who are concerned about children's emotional well-being. Children want to watch frightening programs, and would undoubtedly seek them out even if parents or other caregivers attempted to prevent children from viewing such fare. Furthermore, the expansion of cable and subscription services has made graphic, horrifying presentations easily accessible to children in their own homes, or in the homes of friends. Even children who do not enjoy frightening films may choose to watch them occasionally if encouraged by their peers. Thus, other approaches are needed to help prevent or reduce children's media-induced fright reactions.

Current Research on Fear Responses to Mass Media

During the past several years, Cantor and her associates have undertaken a program of research to study children's emotional responses to media presentations (see Cantor, in press-a, in press-b; Cantor & Wilson, 1988). The research has been conducted within a cognitive developmental framework, and has been based on two primary assumptions. The first assumption has been that cognitive processes such as attention, perception, and interpretation of stimuli influence emotional responses. Most current theories of emotion recognize that cognitive processes play an important role in the generation of emotion (e.g., Lang, 1984; Lazarus & Folkman, 1984; Leventhal, 1980; Mandler, 1984). Theories of cognitive development have been useful in predicting differences in children's emotional responses to media presentations. The second assumption that has guided the research is that emotions are complex phenomena that involve multiple response systems, including subjective, physiological, and expressive components (e.g., Izard, 1982; Lang, 1984; Leventhal, 1984). Measurement of responses in all three domains (verbal report, physiological arousal, and facial expressions) is advantageous because the measures differ in terms of the types of information they can best provide (e.g., the valence or intensity of emotion; change over time). In addition, the use of nonverbal measures permits the validation of self-reports obtained from young children who may have difficulty with verbal report (Cantor, in press-b).

The research conducted by Cantor and her colleagues has focused on fear responses to media presentations, and has been concerned with two major issues. One group of studies has examined the characteristics of media content that frighten children at different ages (Cantor & Sparks, 1984; Cantor, Wilson, & Hoffner, 1986; Sparks, 1986b; Sparks & Cantor, 1986; Wilson & Cantor, 1985; see also Hoffner & Cantor, 1985). Other studies have attempted to identify methods for preventing or reducing children's fear responses (see Cantor & Wilson, 1988, for review). Because the cognitive requirements for different coping strategies vary, these studies have focused on age differences in the effectiveness of various techniques. The present study was designed to investigate further the approaches that can be used to help children cope with frightening media presentations.

In all of their studies on coping methods to date, Cantor and her colleagues have included some type of verbal intervention, often in addition to another strategy. The focus on verbal methods of fear reduction or prevention is undoubtedly due, in part, to practical concerns. First, such techniques are versatile and easy to apply, at least compared to interventions that require visual supports. Furthermore, they are commonly used by parents. Wilson and Cantor (1987) found that 80% of a sample of parents reported that they used some type of verbal discussion technique to help reduce their children's fear responses to media. Finally, although other techniques, such as physical comfort or distraction, can also be implemented with relative ease in many situations, these strategies are generally therapeutic rather than preventive. As the studies to be reviewed below demonstrate, verbal interventions prior to viewing can reduce fear responses during a subsequent program.

Several studies have attempted to reduce fear by altering children's perspective on the frightening events. Cantor and

Wilson (1984) found that instructions to focus on the unreality of the witch in a scene from *The Wizard of Oz* was effective in reducing fear responses among 9- to 11-year-olds, but had no effect on the responses of preschoolers. It was hypothesized that the younger children may have had difficulty keeping the unreality instructions in mind while viewing the movie scene. In addition, although the younger children were able to use the term "make-believe" appropriately, they may have had a more superficial grasp of the meaning of the concept.

In another study (Cantor & Hoffner, 1987), 5- to 9-year-olds viewed a frightening scene from the movie *The Blob* after hearing information about the probability of encountering the depicted threat in the local area. The manipulation of children's beliefs was relatively unsuccessful, possibly due to children's difficulty in understanding verbal probability information (Hoffner, Cantor, & Badzinski, 1987). However, children who thought an encounter with the threat was unlikely were less frightened by the program than those who thought an encounter was likely. This finding suggests that probability information may be effective in reducing fear responses to unlikely events (e.g., being attacked by a shark), if the appropriate mode for communicating such information can be identified.

In a study involving 3- to 11-year-olds, Cantor, Sparks, and Hoffner (1988) found that videotaped information about the positive aspects of the monstrous Incredible Hulk, supported by visual depictions of his helpful behavior, reduced children's fear responses to a subsequent scene featuring the Hulk. Character ratings supported the expectation that the videotape would alter subjects' perception of the Hulk character's intentions and motivations. Fear responses to the scene involving the Incredible Hulk were also reduced by prior exposure to a videotape that showed the actor being made up to play the Hulk. This effect was attributed primarily to a visual desensitization process, although the videotape may also have enhanced children's understanding of the character's fictional status. There were no age differences in the effectiveness of the interventions.

Other studies have examined the effect of providing factual information designed to reduce the perceived danger of a frightening media stimulus. In a study by Wilson and Cantor (1987), 5- to 9-year-olds were exposed to a documentary about snakes (or a control tape) before they viewed the "snake pit" scene from *Raiders of the Lost Ark*. The visual component of the documentary included scenes of snakes at increasingly close range and the verbal component consisted of narration about the habits and beneficial characteristics of snakes. Exposure to the visual and verbal components of the tape was varied factorially. The results showed that the verbal information about snakes tended to reduce fear among 8- and 9-year-olds, but actually increased fear among 5- to 7-year-olds. The authors noted that the narration included complex grammatical forms that could have been misinterpreted by children in the younger group. For example, because young children have difficulty understanding negations and quantifiers, statements such as "although a few snakes are poisonous, most of them are not" may have seemed to convey the message that snakes are poisonous (Badzinski, Cantor, & Hoffner, 1987). The results also showed that exposure to the visual component of the documentary reduced fear responses to the subsequent snake pit scene in both age groups. This effect of visual exposure was attributed to a desensitization process.

A subsequent study by Wilson (1987) found that children's negative affect in response to a scene from *Kingdom of the Spiders* was reduced by prior rehearsal of a verbal explanation that unambiguously (and accurately) described tarantulas as harmless. Negative affect was also reduced by prior exposure to a replica of a tarantula. Only the rehearsed explanation reduced children's perceptions of the dangerousness of tarantulas, however. Wilson attributed the beneficial effects of the verbal explanation to a conscious process of reinterpretation. In contrast, she argued that prior exposure to the replica influenced emotional responses through an automatic process that altered the perceptual representation of the fear object.

The studies reviewed above found that verbal coping techniques were sometimes difficult for younger children to utilize. However, when additional supports were provided, such as visual illustrations or rehearsal of the information, even young children benefited from certain types of interventions. Despite these encouraging results, there is still much to be learned about the ability of verbal interventions to reduce the fear responses of children at different age levels. Many factors limit the choice of information in particular situations, including the objective reality of the content (e.g., news vs. fiction), the probability that a fictional event could actually occur, and the nature of the frightening stimulus. For example, Wilson (1987) selected a film about tarantulas as a stimulus because, contrary to popular belief, tarantulas are harmless to humans. However, parents could not honestly tell a child that an animal such as a shark is harmless. More needs to learned about the kinds of information that are effective in reducing fear associated with different types of content.

One technique that adult viewers seem to consider an effective means of reducing emotional responses involves providing advance information about the events in a program, so the viewer "knows what to expect." Although viewers often avoid hearing or reading about the events in suspenseful media presentations (because prior knowledge would ruin suspense), people sometimes seek out information about potentially upsetting programs.

apparently as a form of coping strategy. Similarly, parents may try to lessen the impact of scary shows on their children by describing in advance the events that will occur. The rationale for this technique seems to be that prior knowledge of events allows the child to prepare emotionally for the frightening scenes, rather than being shocked by sudden, unexpected happenings. In other words, there seems to be a general belief that "forewarned is forearmed." This approach is applicable to a wide variety of media content, but the evidence regarding its effectiveness is equivocal at best. In fact, a recent study found that introductory descriptions of scary film scenes increased adults' feelings of fear and upset while viewing the scenes (Cantor, Ziemke, & Sparks, 1984).

A potentially more effective variation of the "forewarning" strategy involves reassuring a child that the frightening events will eventually be resolved in a happy outcome. When parents are relatively certain that a frightening event will be happily resolved (e.g., when a regular character in a series is in jeopardy), they seem motivated to reassure their children that "everything will turn out OK." Such knowledge is thought to reduce the negative emotional impact of frightening scenes, possibly by casting the events in a less threatening light.

The practical implications of research on these types of coping strategies are evident. If prior knowledge about the events in a scary program or their resolution effectively reduces fear responses, then this type of information could be utilized by both parents and the children themselves. In other words, parents could prepare their children to view a potentially upsetting program by providing information about the events, or children could seek out such information on their own from friends, advertisements, reviews, or other sources (cf. Gantz & Eastman, 1983). Understanding how prior information about a threatening event affects the responses of children of different ages has theoretical implications as well. Several researchers have considered the emotional consequences of prior knowledge about threatening narrative events and/or the outcomes of those events (e.g., Brewer & Lichtenstein, 1981, 1982; Cantor et al., 1984; Comisky & Bryant, 1982). The primary theoretical concern motivating research on this topic has been an interest in how the structure of information in narratives influences emotional arousal and suspense. Little is known, however, about how prior knowledge affects children's responses to threatening events, or how developmental changes in cognitive abilities relate to the effects of prior knowledge.

The present study investigated the ways in which children's emotional reactions to frightening media presentations can be modified by prior information about the depicted events. Before describing this research, an overview is presented of the theoretical perspective that guided the development of ideas about responses to threatening media events. Specifically, Lazarus' theory of stress, appraisal, and coping (Lazarus, 1966; Lazarus & Folkman, 1984) offers a useful framework for understanding how viewers may interpret threat-related information before and during scary scenes, and how prior information may influence their responses.

Cognitive Appraisal and Emotional Responses to Mediated Threats

In media presentations, responses of fear or suspense typically arise when the viewer expects or witnesses dangers, injuries or other negative events involving the characters (Zillmann, 1980; Cantor, in press-a). Zillmann (1980), for example, characterizes suspense as "the respondent's acute, fearful apprehension about deplorable events that threaten liked protagonists (p. 140)." Because the experience of fear seems most closely linked with the possibility of a negative outcome, a viewer should feel frightened when a character is recognized as being in danger (e.g., a killer is approaching), as well as during a disturbing experience (e.g., an attack) when the outcome of the event is uncertain. Information about an upcoming threat or the outcome of a suspenseful program should influence how viewers interpret these events.

Interpretation or appraisal is a central concept in many theories of emotional response (e.g., Arnold, 1960; Bowlby, 1973; Epstein, 1972; Lazarus & Folkman, 1984; Leventhal, 1980; Leventhal & Nerenz, 1983; Zillmann, 1978). Emotion theories that include cognitive appraisal as a central construct seem to have great utility for understanding emotional responses to media content, and the role prior information can play in modifying such responses. In general terms, these theories contend that a cognitive analysis of the meaning or significance of stimuli gives rise to the experience of emotion, although the theories differ regarding the mechanism involved. The importance of cognitive appraisal in theories of emotion was recently noted by Campos and Sternberg (1981): "The recent history of the study of emotion has been dominated by approaches stressing cognitive factors. In theories of adult emotional responses, cognitive appraisal now functions as the central construct" (p. 273). They note that during the past two decades, theories of emotion have come to recognize the importance of how an individual makes sense of stimuli. Rather than assigning primary significance to properties of stimuli and prior learning (e.g., in behaviorist theories), cognitive theories focus on appraisal processes. Prior learning and experiences are important in cognitive appraisal, but the critical factor is how this information is applied in the process of interpretation.

An emphasis on interpretation may seem to preclude the controlled study of the influence of environmental factors on emotional responses. Lazarus (Lazarus & Folkman, 1984; Lazarus, DeLongis, Folkman, & Gruen, 1985), for example, argues for the importance of considering the relationship between environmental input and appraisal processes, rather than focusing on either one independently. Yet despite much individual variability in interpretations, there is much evidence that external factors influence people's interpretations in predictable ways (see Bandura, 1986). This view does not seem to be in opposition to Lazarus' position, since he recognizes the importance of specific types of environmental influences in the development of stress (e.g., Kanner, Coyne, Schaefer, & Lazarus, 1980; Lazarus et al., 1985). Paterson and Neufeld (1987) recently argued for the continued study of environmental determinants of appraisals of threat. They state that "the emphasis on readily observed and manipulated stimuli reduces measurement difficulties and the danger of circularity that can make research on appraisal quite difficult" (p. 404).

Several theorists have given special attention to the role of cognitive appraisal in the development and control of psychological stress, anxiety, and fear (e.g., Epstein, 1972; Lazarus & Folkman, 1984; Leventhal & Nerenz, 1983). The theory developed by Lazarus has been widely applied not only in the area of stress and coping, but also in the area of viewers' responses to vicarious threats depicted in media presentations.

Lazarus' Theory of Stress, Appraisal, and Coping

Lazarus' theory (Lazarus, 1966; Lazarus & Folkman, 1984) focuses on how individuals recognize and respond to situations that threaten their well-being. According to Lazarus, the process of primary appraisal involves perceiving and evaluating environmental cues in terms of their personal implications. A situation may be appraised as irrelevant, benign-positive, or stressful. Stress appraisals involve the recognition of harm/loss, threat, or challenge. Of particular relevance to the present research is the notion of threat, which is defined as "harms or losses that have not yet taken place but are anticipated" (p. 32). Thus, a threat implies that the consequences of an anticipated event are physically or psychologically harmful for the individual. Threat appraisals are typically associated with the emotions of anxiety, fear, or anger. If a situation is appraised as threatening, an individual will evaluate both his or her potential for coping with the threat and the nature of the expected outcome of coping efforts. This process of secondary appraisal may interact with primary appraisals to alter the individual's emotional reaction.

A situation can be appraised as threatening before a feared stimulus is observed, because cues in the environment can signal events prior to their occurrence. Lazarus and Folkman (1984) identify three stages of stressful events: anticipatory, impact, and post-impact. The first two stages are of principal concern here. Lazarus and Folkman (1984) contend that during the anticipatory stage, "the issues to be appraised include whether [the event] will happen, when it will happen, and what will happen" (p. 147). The actual impact of a stressful event may include elements of threat, because the outcome and future consequences of the event are as yet unknown. Appraisals of the threatening event during the anticipatory and impact stages can influence emotional responses during these periods.

Although Lazarus and Folkman emphasize appraisal processes, they identify situational factors that may be expected to affect threat appraisals, including event uncertainty (i.e., whether it will happen) and temporal uncertainty (i.e., when it will happen). Threat appraisals should also be affected by "person" factors such as the importance of the outcome to the individual and his or her ability to influence or control the outcome. Although Lazarus and Folkman (1984) do not address developmental issues, they recognize that developmental changes in cognitive abilities may also influence appraisals and emotional responding. In general, the greater the perceived degree of threat in a situation, the greater stress or anxiety the individual should experience.

Coping efforts during the anticipatory and impact stages include strategies to regulate emotion and strategies to alter or control the situation itself. Emotion-focused coping strategies include attention regulation (e.g., distraction) and reappraisal of the meaning of the situation. Problem-focused strategies involve active interventions directed at altering the environment. Because viewers cannot influence the outcomes of events depicted in movies or television programs, emotion-focused strategies are generally the only techniques available for coping with mediated threats.

The Role of Prior Information in the Arousal and Reduction of Fear

A closer examination of Lazarus' theoretical views can provide a better understanding of how prior information would be expected to influence emotional responses to a frightening media presentation. Two fundamental questions need to be considered in more detail: 1) To what extent can prior information influence appraisal processes and subsequent emotions? and 2) To what extent can prior information influence reappraisals and thereby reduce ongoing emotional reactions? The first question relates to the initial appraisal of events as they transpire, whereas the second question deals with responses after a threat appraisal has been made (e.g., during the depiction of a threatening event). The answers to these questions depend, in part, on whether the information must be consciously applied or can influence responses without conscious effort (once the information has been stored in memory).

To address these questions, several principles dealing with appraisal processes and emotion were derived from Lazarus' work. These principles have implications for understanding how prior information may be able to influence emotional responses. Each principle is identified and discussed below, and relevant empirical evidence is summarized.

1. Prior information can influence appraisals of environmental cues. Lazarus and Folkman (1984) contend that prior knowledge related to an event, or "what the individual might have seen, read, heard, or otherwise inferred" (p. 83), influence appraisals of the event. In general, they endorse the widely held view that experiences are interpreted in terms of what is already known (e.g., Schank & Abelson, 1977). If prior information is understood and stored in memory, then this knowledge should influence appraisals of subsequent events.

1a. Appraisals can elicit anticipatory emotional responses. This point was discussed earlier. Environmental cues that are appraised as threat-related (e.g., because they are known to signal danger) may elicit emotional responses in anticipation of the actual occurrence of the threat. Consistent with this view, Bandura (1986) states that emotions arise when people "foresee from predictive cues what is likely to happen and...summon up anticipatory reactions" (p. 193). There is much empirical support for the existence of anticipatory emotions. Related studies have shown that the expectation of negative outcomes, in the absence of any objective threat, can induce feelings of depression, anxiety, or fear (Bandura, 1986; Beck & Emery, 1985). In addition, people who are afraid of particular situations or objects become anxious and physiologically aroused simply by thinking about actual exposure or by observing the threat object from a distance (Lang, 1984; May, 1977; Sarason, 1978; Tesser, 1978).

1b. Appraisals that evoke emotions may be relatively automatic. Lazarus (1982; Lazarus & Folkman, 1984) contends that the appraisal of meaning and significance can sometimes occur instantaneously, without conscious awareness. In discussing the role of cognition in emotion, Lazarus & Folkman (1984) state that people "respond early in the processing sequence to partial cues, sometimes with such speed that meaning and emotion seem to occur simultaneously with perception" (p. 277). They point out, however, that further processing of emotion-laden information involves conscious appraisal.

Other emotion theorists have also argued that emotions may be activated without conscious thought (e.g., Lang, 1984; Leventhal, 1980; Leventhal & Mosbach, 1983; Mandler, 1984; Zajonc, 1984). Leventhal, for example, contends that emotional processing is generally automatic and not fully accessible to conscious awareness, and he reviews a large body of research supporting this view. Contextual cues and nonverbal expressions, for example, can evoke emotional responses without the individual's awareness of the source of emotion.

Lewicki and Hill (1987; see also Lewicki, 1986) review research suggesting that environmental cues can recruit emotional responses without conscious awareness, and that these responses may conflict with an individual's conscious views or knowledge. They provide the following illustration: "When watching movies like *Love Story* or *Lassie Come Home*, people often recognize a primitive manipulation designed to affect viewers' feelings, but they still feel touched and they cannot stop their tears" (p. 358). This observation suggests that the emotion-arousing properties of stimuli may be stronger than the emotion-reducing properties of conscious thought. This notion will be addressed shortly.

1c. The influence of information on appraisals is stronger when cues are ambiguous. Lazarus and Folkman (1984) contend that people can appraise harm or threat when there is little evidence for such appraisals, or can fail to recognize indications of threat. They state that "in general, the greater the ambiguity, the more room there is for a mismatch between an appraisal and what eventually transpires" (p. 187). Because information stored in memory can influence appraisals, this information should partially determine how ambiguous cues are interpreted. There is some evidence that prior information can influence interpretations of ambiguous social stimuli (Bargh & Pietromonaco, 1982; Jacoby & Kelley, 1987). Thus, it seems likely that prior information can enhance (or reduce) recognition that certain cues in a situation portend danger, and can thereby facilitate threatening (or benign) interpretations of ambiguous cues.

2. Cognitive reappraisals can reduce ongoing emotional responses. There are several ways an individual can cope with negative emotional responses (e.g., distraction, denial), but the process of reappraisal relates most closely to the expected effects of information about an eventual happy outcome. Lazarus and Folkman (1984) define reappraisals as "cognitive maneuvers that change the meaning of a situation without changing it objectively" (p. 151). Other theorists (e.g., Leventhal & Mosbach, 1983) also recognize that reinterpreting threatening stimuli as benign or positive can reduce the intensity of negative emotions. There is much evidence that prior information can be used to redefine a threatening event in nonthreatening terms, and can thereby reduce feelings of fear and distress in a variety of situations (e.g., Blitz & Dinnerstein, 1971; Langer, Janis, & Wolfer, 1975; Lazarus & Alfert, 1964; see also Folkman & Lazarus, 1985).

2a. Reappraisal processes must be consciously employed. Lazarus and Folkman (1984) contend that the emotion-focused coping strategy of reappraisal requires conscious effort. In their discussion of coping processes, they define coping as an "effortful" process, and specifically exclude what they term "automatized behaviors or thoughts." They point out, however, that environmental stimuli are constantly being appraised and reappraised as new evidence emerges, and they limit their discussion of coping to self-generated reappraisals. Leventhal and Mosbach (1983) also contend that reinterpretations of emotion-relevant stimuli are effective only if actively used. The contrast between the nearly automatic arousal of emotion (under some conditions) and more effortful attempts to reduce emotion is a phenomenon that has long been observed in attempts to treat phobias and other affective disorders. Rachman (1981) recently noted that efforts to reduce emotional responses by cognitive means are much less successful than efforts to induce emotions in a similar manner.

Summary

To summarize, Lazarus' theory of stress, appraisal, and coping provides a useful framework for understanding the potential influence of prior information on emotional responses to a threatening media event. Briefly, the principles outlined above suggest that prior information can influence anticipatory emotions by eliciting thoughts about expected events, or by influencing initial appraisals, especially when cues are ambiguous. In addition, information may prompt conscious reappraisals of events recognized as threatening.

The present investigation focused on the role of prior information in regulating emotional responses to media presentations. Specifically, the study examined the separate and combined effects of prior information about a threatening media event and its happy resolution on children's emotional responses. Children's fear and worry during the program, as well as their happiness in response to the presentation of a happy outcome, were assessed. As noted above, the threat forewarning was not expected to reduce fear. However, because of the perceived utility of this strategy, there is practical value in obtaining empirical verification of its ineffectiveness (or countereffectiveness). Furthermore, both the threat forewarning and prior knowledge of the happy outcome were expected to produce theoretically interesting findings regarding children's responses to suspenseful presentations. Because both types of prior information were expected to alter suspense and enjoyment of the frightening program, a secondary purpose of this study was to examine the relationships among prior information, suspense, and enjoyment.

The relevant literature is reviewed in the next two chapters. In Chapter Two, research on the effect of prior information is reviewed from the perspective of Lazarus' theory. The first section of Chapter Two addresses the effect of prior information about the intensity, probability, and timing of threatening events. The second section deals with prior knowledge of a happy outcome. Potential interactions between a threat forewarning and prior knowledge of a happy outcome are also considered. Most of the relevant studies have focused on the role of information in modifying responses to direct threats, such as shock or surgery, rather than threats witnessed in media presentations. Thus, the implications of the research for responses to media presentations are also considered. In addition, because nearly all the research involves adults, developmental predictions are based on inferences about the abilities that may underlie the effects of each type of prior information. Finally, the conclusions from each area are summarized, and hypotheses and research questions are presented.

Chapter Three considers how prior information about the events in a program should influence suspense. Research on the relationship between suspense and enjoyment, involving both children and adults, is reviewed and discussed in relation to the present study.

CHAPTER TWO

The Effect of Prior Information on Responses to a Threat

This chapter reviews research on the emotional effects of information about a threatening event and its outcome. Within the theoretical framework proposed by Lazarus (e.g., Lazarus & Folkman, 1984), information about a threatening event should influence primary appraisals regarding the degree of threat posed by the event, and thus the degree of fear or anxiety experienced. Information about a happy resolution is more closely related to the cognitive coping strategy of reappraisal, which can be used to reduce emotional responses to a threat. Most of the relevant research, especially regarding information about a threat, has been done within the domain of stress and coping.

There are two major difficulties associated with using this research to generate hypotheses about the effect of prior information on children's emotional responses to media presentations. First, because the research has been concerned primarily with understanding real-life stresses, most studies have focused on responses to physical threats or other experiences that had personal consequences for the subjects (e.g., taking exams). Laboratory studies have typically used physically aversive stimuli such as shock and noxious noise, and field experiments have examined responses to more serious real-life threats such as surgery and painful medical treatments. In contrast to such direct threats, media presentations deal with threats experienced by characters, which are only indirectly experienced by the viewer. Anticipating and observing the aversive experiences of someone else is clearly not the same as experiencing, or expecting to experience, the events personally. Lazarus (1966; Lazarus & Opton, 1966) presented some tentative evidence that responses to direct and vicarious threats are similar, and proposed that viewers respond to mediated threats through a process of identification with the characters. There is much evidence that viewers become involved with media characters, and respond emotionally to the experiences they undergo (see Hoffner & Cantor, in press; Zillmann, 1980). It appears that viewers may experience the events vicariously, by sharing an endangered character's viewpoint, or that they may respond as though the character were of personal importance to them. Thus, fear or anxiety may arise from expecting that harm may befall a character, or from anticipating the "loss" of the character if he or she were killed (Cantor, in press-a). In either case, exposure to such depictions seem to be consistent with Lazarus and Folkman's (1984) definition of a threat.

A second problem with using the literature on prior information to generate hypotheses about children's responses to mediated threats is that very little research on this topic has used children as subjects (Melamed, Siegel, & Ridley-Johnson, 1988). Virtually no laboratory research has studied the role of information in children's responses to threatening events, undoubtedly due to ethical considerations associated with inducing pain or psychological stress in children. Field studies have examined the use of prior information to help children cope with impending medical treatment (see Melamed et al., 1988, for review). Unfortunately, however, these studies are limited by the fact that the messages usually involved many components, and because they frequently combined data from children across a wide age range (e.g., Faust & Melamed, 1984). Because of the limitations of current research, the literature review focuses on research with adults, and developmental predictions are based on an analysis of the cognitive abilities needed to utilize prior information.

This chapter includes two major sections, one dealing with information about a threat, and one dealing with prior knowledge of a happy outcome. Each section is organized in the same way. The research with adults is reviewed first, and various theoretical explanations for the findings are considered. Implications of the research for media presentations, and reasons for expecting developmental differences are then discussed. A third section considers possible interactions of the two types of prior information. Finally, an overview of the present study is provided. Before the research is reviewed, a brief discussion of terminology and ways of measuring of "stress" is necessary.

Researchers have used a variety of terms to characterize emotional responses to threatening stimuli. Stress appears to be the most general term used to describe responses to threatening events. Not surprisingly, there has been a great deal of debate over the meaning of the concept of stress (Engel, 1985; Lazarus & Folkman, 1984; Leventhal & Nerenz, 1983). The stress response has been characterized generally as a reaction that follows some type of environmental demand or disruption (Mandler, 1984). More specifically, stress has been conceptualized as a physiological and subjective response to a physical or psychological threat. Physiological arousal, usually measured in heart rate and skin conductance, has frequently been used as an indicator of stress. The subjective component of stress has been measured in ratings of nervousness, tension, distress, anxiety, fear, and other negative states. The fact that such a wide variety of states are used as indicators of stress highlights the fact that there is little agreement on the specific meaning of the concept.

Other research on responses to threatening stimuli has focused on the more specific emotions of anxiety and fear, although the meanings of these terms have also been a matter of debate. Some researchers describe anxiety as an emotion that accompanies threatened separation or danger (i.e., an anticipatory emotion), but consider fear to be a response to a specific, concrete stimulus (e.g., Mandler, 1984). Others contend that fear may arise in anticipation of harm, as well as in response to a specific experience. Izard (1977), for example, states that fear is caused by "internal and external events, conditions, or situations that signal danger. The threat, as well as the potential harm, may be physical or psychological (p. 356)." Beck and Emery (1985) also emphasize "the essential future orientation of fear" (p. 11). Many researchers, however, have used the terms fear and anxiety interchangeably (Beck & Emery, 1985).

There also appears to be little consistency in the media literature in the use of terms related to stress, anxiety, and fear (Cantor, in press-a). Several studies have described "stress" reactions to frightening films (e.g., Johnson, 1980; Lazarus, 1966; Sparks & Spirek, in press), but researchers have typically assessed responses to such films by asking subjects how scared, frightened, anxious, tense, or worried they felt while viewing.

The present research was not designed to clarify the conceptual meanings of these terms. However, it seems that when research involves obtaining self reports, the critical factor in the choice of emotion labels should be the participants' understanding of the terms. All of the emotion-related terms used to assess negative responses to horror or suspense films seem to be loosely linked to the emotion of fear (Izard, 1977). A recent study of adults' understanding of emotion concepts supports this view (Shaver, Schwartz, Kirson, & O'Connor, 1987). Shaver et al. (1987) had subjects sort 135 emotion terms into an unrestricted number of categories. A cluster analysis revealed that the words anxiety, nervousness, tenseness, apprehension, worry, and distress (among others) were clustered together and were associated with the more fundamental emotion of fear. To avoid misrepresentation, the research to be reviewed in this chapter will be discussed in terms of the specific measures employed in each study.

Forewarning of a Threat

There is a large body of literature that addresses the emotional impact of information about a threat. Prior information can provide knowledge about several aspects of an impending threat: 1) the *characteristics* of the threatening event; 2) the *probability* that a threat will occur -- or whether a threat will occur; and 3) the *timing* of occurrence of the threat (Epstein, 1972; Lazarus & Folkman, 1984; Miller, 1981; Paterson & Neufeld, 1987). Information about the characteristics of a threatening event can include descriptions of what an individual can expect to experience (response information), or descriptions of the event itself in either threatening or nonthreatening terms (stimulus information). Information about the occurrence of an event can convey absolute knowledge of whether an event will occur (e.g., you will [or will not] have surgery tomorrow), or can indicate the probability of occurrence (e.g., there is a 25% chance that the tumor will recur). Finally, information can influence two factors related to the timing of a threat: knowledge of the time of occurrence, and the length of the anticipatory period. Research has examined the effects of prior information on responses during both anticipation and impact (Lazarus & Folkman, 1984; Miller, 1981).

Review of Theory and Research

Characteristics of the expected threat. Prior information about the nature of an aversive event is commonly thought to reduce fear or distress by letting people "know what to expect." This view is consistent with the concept of "stress inoculation" (Janis, 1983; Meichenbaum, 1977), which refers to the ability of prior information to inoculate people against adverse emotional responses to a stressful event. Prior information about what to expect, according to Janis (1983), permits an individual to build up "cognitive defenses" by mentally rehearsing the anticipated experience and developing reassuring thoughts. However, it appears that the information about the event itself is not the most important factor leading to stress tolerance. The inoculation procedure typically involves "realistic warnings, recommendations, and reassurances to prepare [people] to cope with impending dangers" (Janis, 1983, p. 67), and the benefits of treatment appear to derive more from the provision of coping strategies than from the "warnings" about what to expect (Langer et al., 1975).

The notion that accurate expectations should reduce fear is also consistent with the theory advanced by Berlyne (1960). Berlyne argued that uncertainty or the lack of information induces conflict and physiological arousal, and that people seek information to reduce uncertainty. For example, he states that specific expectations about an upcoming event "may diminish stress by making adjustment less abrupt and by obviating the increment of arousal that is contributed by surprisingness" (p. 184). Thus, in Berlyne's view, information about an upcoming threat should reduce uncertainty and surprise, and lead to lower levels of arousal during the impact of a stimulus.

Controlled research has examined the separate and combined effects of prior information about several aspects of threatening events, including the sensations or responses an individual can expect to feel, the procedures or equipment to be used, and the stimuli involved. In one study (Staub & Kellett, 1972), subjects expecting to receive electric shock heard a description of the sensations they would experience (e.g., you'll feel a "slight tingle") and/or a description of the safety features of the shock apparatus. Both types of information, separately, reduced subjects self-reported worry about the effects of shock, but not their fear. Furthermore, when sensory information was combined with assurances of safety, subjects were able to tolerate more intense shocks than subjects who received no information. The authors argued that the sensation information produced accurate expectations and that the safety information minimized the danger subjects expected. The greater effectiveness of the combination of the two was attributed to an increase in the credibility of the safety assurances when combined with the apparently accurate sensation information.

Johnson (1973) gave subjects accurate information either about the sensations they would feel during ischemic pain (produced by a blood pressure cuff), or about the procedures. Subjects who received sensation information reported less emotional distress during the experience than those who heard procedural information, although the two groups did not differ in their ratings of the stimulus intensity. Johnson concluded that the congruity between expectations and experience (i.e., the lack of surprise) was the primary factor underlying the observed effects. Subsequent research, in both laboratory and hospital settings, found that preparatory information about the physical sensations associated with a noxious stimulus reduced emotional distress, physiological arousal, and the perceived impact of the stimulus (e.g., Johnson, 1975; Johnson & Leventhal, 1974; Sime, 1976). One study, involving children aged 6 to 11, found that sensation information was more effective than no preparation in reducing children's overt expressions of distress during removal of a plaster cast; procedural information did not reduce distress (Johnson, Kirchhoff, & Endress, 1975).

There is evidence, however, that some types of information increase anxiety, even if they produce accurate expectations. Epstein (1973), for example, reported that warnings about the painfulness of a stimulus increased distress. Leventhal and his colleagues argued that pain warnings lead subjects to interpret a stimulus as a threatening event by "stimulat[ing] expectations and uncertainty about possibly harmful outcomes" (Leventhal, Brown, Shacham, & Engquist, 1979, p. 690). In a study involving exposure to ischemic pain (a cold pressor treatment), they found that the beneficial effects of sensory information were eliminated by a pain warning ("the sensation of pain will begin to get very strong"). The accuracy hypothesis, derived from Berlyne's work, cannot account for this finding, because subjects who heard both the sensation information and the pain warning had the most accurate information about what they would feel. Based on this and other evidence, Leventhal (et al., 1979; 1980) argued that sensation information reduces distress by leading subjects to form a schema of the objective, informational aspects of the stimuli. In other words, emphasizing the sensory properties of a stimulus leads individuals to focus on the nonthreatening aspects of their experience, rather than on the painful, emotional aspects.

The work that has focused on sensation information indicates that communications that minimize danger or suggest a nonthreatening interpretation reduce distress during a painful experience. Conversely, the data suggest that information that magnifies the threatening nature of an event (e.g., a pain warning) increases distress. These studies are limited in their generality, however, because they have focused primarily on responses during physical pain. Response information, such as the sensations produced by a painful stimulus, is relevant only to stimuli that produce physical effects. In addition, these studies examined the effect of prior information on distress only during impact; they did not consider its effect on anticipatory responses.

Other research has studied the effects of information about the intensity of threatened events on responses during anticipation and/or impact. Paterson and Neufeld (1987) propose that variations in the physical or perceptual intensity of a stimulus influence appraisals of the severity of a threat. Several investigators have manipulated the expected intensity of a noxious physical stimulus. Overall, the evidence supports the hypothesis that the greater the anticipated intensity of the threat, the greater the stress experienced during the anticipation and impact. In one study, Epstein and Clarke (1970) manipulated the level of anticipated threat by varying the expected volume of an aversive tone (low, medium, or high) through verbal description. The data showed that skin conductance and heart rate during the anticipatory period increased as the degree of threat increased. In addition, the high threat group reacted most strongly to the impact of the tone, which was actually the same intensity for all groups.

Consistent with Epstein and Clarke's (1970) results, Deane (1969) found greater heart rate acceleration for subjects expecting to receive a strong shock than for those expecting a mild shock. Elliot (1966) found no differences in heart rate or self-reports of tension associated with expected shock intensity (mild or strong). However, subjects in both groups in Elliot's study had received a "sample" shock beforehand, which was described as the shock intensity that would be delivered. Subjects who knew nothing about the nature of the upcoming shock (i.e., had not received a sample) had higher anticipatory heart rate than the two other groups. It seems likely that subjects with no information may have imagined that the shock would be much more intense than it actually was, and that the "sample" shock had demonstrated the tolerable nature of the stimulus. In another study (Franzini, 1970), subjects rated the aversiveness of an anticipatory period while expecting to receive mild, moderate, or strong shock. Aversiveness increased with the expected intensity of the shock.

With regard to media presentations, the expected intensity of threatening events may be manipulated verbally by the use of adjectives or emotion-relevant words, or by the use of linguistic intensifiers (e.g., Cantor et al, 1984; Neufeld, 1976). A series of studies by Lazarus and his colleagues examined the effects of information designed to alter subjects' appraisals of distressing films (Lazarus & Alfert, 1964; Lazarus, Opton, Nomikos & Rankin, 1965; Speisman, Lazarus, Mordkoff, & Davison, 1964). The films showed adolescents undergoing ritual circumcision or workers experiencing traumatic injuries in a woodworking shop. Information that described the events as painful and/or damaging to the participants increased subjects' skin conductance and heart rate during the stressful scene, relative to subjects who did not hear information designed to magnify the intensity of the threat. In contrast, messages that emphasized the positive or nonthreatening aspects of disturbing events reduced arousal (and self-reports of distress in Lazarus & Alfert [1964]), relative to control conditions. These results are consistent with the view that information about the nature of a threat can either increase or decrease fear, depending on the interpretation suggested by the information.

In a recent study, Cantor et al. (1984) manipulated the explicitness of the descriptions subjects heard before viewing four scenes from a horror movie about vampires. The scenes were preceded by vague descriptions of the upcoming events (e.g., "he must kill her"), explicit descriptions (e.g., "he hammers the stake into her heart as she screams wildly"), or no information at all. Subjects' self-reports of fear and upset (experienced while viewing the last two scenes) increased with the explicitness of the introductions. A similar pattern was found for heart rate during the climactic scene in which the protagonist is attacked by his wife-turned-vampire.

Overall, the research indicates that accurate expectations about a threatening event do not necessarily reduce emotional responses to the event. In the studies reviewed above, prior information that encouraged a positive or nonthreatening interpretation of a stressful event reduced subjective and physiological indicators of fear. In contrast, information that magnified perceptions of danger or the perceived severity of the event increased arousal and fear responses, both before and during the threatening event. The studies of mediated threats (e.g., Cantor et al., 1984; Speisman et al., 1964) demonstrated that relative to no information, a description of the threatening elements of a media event should enhance rather than reduce fear.

Probability of occurrence. The most basic information about the occurrence of an event is whether or not it will happen. Not surprisingly, several studies found that subjects expecting a threat showed greater anticipatory arousal and anxiety than subjects expecting a nonthreatening event such as visual stimulation (Holmes & Houston, 1974; Solomon, Holmes, & McCaul, 1980; Spacapan & Cohen, 1983). Although none of these studies actually administered the threatened event, Spacapan and Cohen (1983) found that expecting an aversive stimulus produced the same psychological aftereffects (e.g., decreased tolerance for frustration) as those usually observed among subjects who were actually exposed to the stimulus. Thus, it appears that expecting a threat is more aversive and arousing than not expecting a threat. However, it is not clear whether uncertainty about the possible occurrence of a threat is more or less stressful than knowing that the threat will occur.

Two alternative hypotheses have been advanced regarding the relationship between the probability of an event's occurrence and anticipatory stress. The first hypothesis is that the greater the probability of an aversive event, the greater the anticipatory stress. Paterson and Neufeld (1987) reasoned that the degree of threat should be a multiplicative function of the probability of the threat and its severity. Thus, the greater the probability of a threatening event, the more aversive it will seem. The second hypothesis is that a 50% probability should be associated with the greatest stress because it is the condition of least certainty (cf. Berlyne, 1960). The data regarding these competing hypotheses are inconsistent, however (Lazarus & Folkman, 1984; Paterson & Neufeld, 1987).

Several studies manipulated the expected probability of receiving a shock at a known time, and examined physiological arousal during the anticipatory period. Epstein and Roupenian (1970) told subjects there was a 5% chance, a 50% chance, or a 95% chance that they would receive a shock at a specified time. On the first trial, no subjects received a shock, and on the second trial, all subjects received a shock. The group with a 5% expectation had the highest heart rate and skin conductance levels during both anticipatory periods, and reacted more strongly to the shock administered on trial 2. There was little difference between the responses of the other two groups, with the exception that the 50% group showed an increase in heart rate in response to the shock that resembled that of the 5% group. Based on comments from the subjects, the authors reasoned that the 50% group had subjectively inflated the probability of shock (i.e., they assumed they would receive a shock) in order to reduce the element of surprise. The 5% group, on the other hand, remained uncertain and thus experienced more stress. A similar study was conducted by Monat, Averill, and Lazarus (1972). The probabilities of receiving shock were described as 5%, 50%, or 100%. They found no group differences during anticipation on measures of heart rate, skin conductance, or self-reported tension.

Another study (Gaines, Smith, & Skolnick, 1977) examined heart rate as a function of the stated probability of receiving a loud blast of noise (5%, 50%, or 95%). The effect of the probability information varied according to subjects' cognitive style (i.e., field dependence), and was generally difficult to interpret. In fact, as Paterson and Neufeld (1987) noted, the authors relied on different explanations for the results associated with each level of probability. In addition, the small number of subjects involved ($\underline{N}$ = 24) calls into question the reliability of the results.

Paterson and Neufeld (1987) reviewed studies on attitude change that included information about the probability of personally experiencing aversive events. The impact of probability on compliance with persuasive messages about threat-related behaviors (e.g., smoking, reckless driving) was inconsistent, and depended to some degree on the availability of an effective coping strategy (e.g., Rogers & Mewborn, 1976; Mewborn & Rogers, 1979).

Finally, Comisky and Bryant (1982) manipulated subjects' expectations about the outcome of a suspenseful film sequence. They found that the lower the stated probability of a positive outcome (the protagonist's escape from a firing squad), the more suspenseful the film was judged to be, as long as the possibility of a positive resolution remained. Unfortunately, subjects' emotional responses to the film were not obtained. The results, however, are consistent with a third hypothesis, which deals with the relationship between probability of occurrence and suspense. Zillmann (1980) proposed that suspense (and "fearful apprehension") increases as the probability of a tragic outcome increases, with the exception that suspense is eliminated by the certainty of a negative outcome. In other words, greater danger is associated with increased fear, but a viewer who knows that a tragic outcome is inevitable should feel sadness or disappointment rather than fear. This hypothesis is intuitively plausible as a description of responses to mediated threats.

Overall, the results regarding the probability of an aversive experience are inconclusive. Lazarus and Folkman (1984) argue that in real life, maximum uncertainty is most stressful, because it has an immobilizing effect and interferes with coping processes. They note, however, that some degree of ambiguity about an outcome may be beneficial in some cases, because it permits an individual to maintain hope for a positive resolution. This latter view is consistent with the proposal advanced by Zillmann, and may be closer to describing short-term emotional responses to media presentations. The relationship between probability and stress may depend on factors such as whether the threat is physical or psychological and whether it has short-term or long-term consequences.

Temporal factors in threat forewarning. Two important temporal aspects of a threatened event are knowledge of when the event will occur (temporal predictability), and the length of the anticipation interval. In research on the effects of temporal uncertainty, the occurrence of an event has typically been signalled either by the presence of a predictor (e.g., a warning light) or by specifying the time at which the event will occur and making the time cues salient (e.g., watching a clock). Information about an event's occurrence has often been interpreted as providing a form of psychological control over the event, and there is ample evidence that people generally prefer to know when an aversive event will occur (Miller, 1981).

Several theories have been concerned with explaining the beneficial effects of knowledge about the timing of an aversive event. The safety signal hypothesis focuses on the total amount of time a subject spends fearing the onset of an aversive event (Seligman, 1975). According to Seligman, subjects exposed to predictable events are afraid only when a predictor indicates that the threat is imminent, whereas subjects exposed to unpredictable events are always afraid. The most important aspect of signals, therefore, seems to be their ability to predict safe periods when no threat is possible. The most convincing support for the hypothesis has come from studies with animals (Abbott, Schoen, &

Badia, 1984). With humans, cognitive mediation (e.g., the use of cognitive coping strategies) becomes an important factor in determining stress during anticipation periods (Lazarus & Folkman, 1984). Berlyne's (1960) theory of information seeking, discussed above, also suggests that uncertainty about the timing of an event should induce conflict and thereby increase arousal and distress. Conversely, temporal certainty should be associated with less arousal and distress. Finally, according to the preparatory response hypothesis (Perkins, 1968), knowledge of the timing of an impending threat can permit physical preparation through such activities as tensing one's muscles or initiating avoidance behaviors (Pervin, 1963; Woodworth, 1958).

Research has produced inconsistent findings regarding the emotional effects of knowing when a threat will occur. Some studies have shown that temporally predictable events are associated with lower levels of anticipatory arousal and stress then temporally unpredictable events (e.g., D'Amato & Gumenik, 1960; Epstein, 1973; Katz & Wykes, 1985; Klemp & Rodin, 1976; Pervin, 1963). Katz and Wykes (1985), for example, found that shocks that predictably occurred at the end of specified trial periods (ranging in length from 9 to 15 seconds) were associated with fewer electrodermal responses (indicating lower arousal) and lower self-reported distress than shocks that occurred at an unpredictable time during the trial periods. They argued that knowing when a shock would occur allowed subjects to prepare for the shock and thereby reduce its aversiveness. They also found that subjects who received unpredictable shock experienced the shock as more intense, despite the fact that the shock was objectively the same for both groups.

Other studies, however, show that knowing when an aversive event will occur is associated with greater anticipatory arousal and/or more subjective fear or anxiety (e.g., Geer & Maisel, 1972; Mansueto & Desiderato, 1971; Monat, 1976; Monat et al., 1972; Miller, 1979). Most of the relevant studies either did not administer the threatened event, or failed to find impact differences (Miller, 1981). Monat et al. (1972) pointed out that one of the reasons for the conflicting results may be due to differences in the length of the anticipation period. Researchers who found that temporally predictable shocks were less aversive than unpredictable shocks generally used short waiting periods of one minute or less. Monat et al. (1972) reasoned that with longer periods, subjects may be able to initiate coping strategies, and thereby lower their level of stress. In their study, they used a waiting period of 3 minutes, and obtained over-time response measures. They found that under conditions of temporally uncertain shock (to occur any time during the waiting period), subjects initially reported high levels of tension, but engaged in more avoidant thoughts as time progressed, and showed a corresponding reduction in arousal and tension. Under conditions of temporally certain shock, subjects thought more about the shock as the specified time approached, showed greater physiological arousal, and reported greater tension. Differences between the groups occurred primarily during the last minute of the anticipation period. Monat (1976) found similar results for waiting periods of 3 and 12 minutes, but not for a waiting period of one minute. In discussing their findings, Monat et al. (1972) stated that:

> although temporal uncertainty conditions initially may be appraised as more threatening than time-locked conditions, they allow a pattern of coping (attention deployment) [to develop]....[U]nder conditions in which a person knows exactly when the aversive event is to occur,...his thoughts turn increasingly toward vigilant examination of the anticipated event as it grows imminent; and this increased vigilance is accompanied by an increase in [affective] arousal. (p. 250)

In a similar argument, Miller (1981) proposed that knowledge of timing increases the salience of the threat and makes it more difficult to engage in distraction, especially as time progresses. In contrast, not knowing when a threat will occur makes it easier to "tune out" the threat and divert attention to other thoughts (cf., Folkins, 1970; Lazarus, 1975). Thus, the conflicting findings can be reconciled if the appraisals and coping strategies of subjects are considered (Miller, 1981; Lazarus & Folkman, 1984).

To summarize, an unpredictable event, over the short term, may be viewed as more threatening and uncontrollable than a predictable event, perhaps because the harm seems more imminent. But with longer anticipation intervals, avoidant coping strategies can be implemented, and their use is facilitated by the absence of cues signalling the occurrence of a threat (i.e., under conditions of temporal uncertainty). In the presence of such cues (i.e., as the occurrence of a temporally certain threat approaches), attention is directed toward the threat. Focusing on an imminent threat should highlight the potential for harm or danger, and should increase the event's perceived aversiveness (Lazarus & Folkman, 1984). The presence of a cue signalling an aversive event is reliably associated with increased anticipatory arousal and stress.

A related aspect of the timing of a threat is the length of the anticipatory period. Research has examined anticipation periods of different lengths, preceding threats with known times of occurrence. In general, when a threat is anticipated, anxiety and arousal build up as the event approaches, or becomes more imminent (Paterson & Neufeld, 1987).

In one study, Breznitz (1967) warned subjects that they would receive a strong shock at the end of a 3, 6, or 12 minute waiting period. Subjects were instructed to attend to a clock while waiting. After an initial reaction to the warning, heart rate decreased, and then increased as the event became more imminent. The longer the anticipation period, the higher the peak heart rate. Although self-reports of emotion were not obtained, when subjects were given the choice of waiting 1, 2, or 3 minutes for a shock, the majority chose the shortest delay. In a subsequent article, Breznitz (1971) attributed the increase in arousal over time to the cognitive component of "worrying." Franzini (1970) reported similar findings for subjects' estimates of the aversiveness of the waiting period preceding shock: longer intervals were considered more aversive. It seems reasonable to expect that since subjects who are forewarned have more time to "worry," and to build up anticipatory arousal, they should be more worried and aroused than subjects who are not forewarned. Breznitz (1967) pointed out that this effect would be expected only if subjects are prevented from distraction (i.e., by attending to threat cues).

Folkins (1970) varied the length of the anticipation period during which subjects waited for a shock (5 s, 30 s, 1 min, 3 min, 5 min, or 20 min). Although a clock was present, subjects were not required to attend to it. She found that heart rate and skin conductance increased during the anticipation period for the three shortest intervals, with the highest level of arousal recorded during the 1 minute interval. For the three longer intervals, physiological responses were consistently low until approximately one minute before the expected shock, at which point they showed a sharp increase. Self-reports of tension and anxiety (for the entire session) were highest for the 30 second and 1 minute intervals. Follow-up interviews suggested that, during the longer intervals, subjects were able to initiate effective cognitive coping strategies (e.g., minimizing the potential harm).

One study on stress and anticipation time used a film as a stimulus. Nomikos, Opton, Averill, and Lazarus (1968) showed subjects one of two versions of an industrial safety film that depicted serious accidents in a wood shop. In the "suspense" version of the program, each accident was preceded by several scenes (lasting approximately 22 seconds) that suggested that an accident was about to occur (e.g., shots of a worker's fingers near the blade of a saw). In the "surprise" version of the film, the anticipation time was very short (approximately 5 seconds). The authors found that subjects who saw the suspense version experienced greater physiological arousal (as indexed by heart rate and skin conductance) than those who saw the surprise version, both before and during the accident scenes. Both groups showed greater increases in arousal during the anticipatory period than during the actual viewing of the accidents. Self-reports of stress or tension, however, were not different for the two groups.

Overall, the results indicate that the longer a threat is awaited, the higher the levels of arousal and stress. Consistent with this view, Tesser's (1978) work on self-generated attitude change shows that thinking about a stimulus intensifies feelings about it. Thus, thinking about expected events that are initially appraised as threatening should make the events seem more threatening. However, the use of coping strategies to divert attention or minimize the threat may be effective in reducing stress. Many factors undoubtedly influence coping behaviors, including the nature of the anticipated threat and the motivation an individual has to attend to threat-relevant information.

Application: Forewarning of a Threatening Media Event

Several important factors that influence appraisal of threat were reviewed above. These factors, which can be manipulated by the provision of prior information, include the intensity, probability of occurrence, and timing of a threat, as well as the length of the anticipation period. A brief analysis of the typical structure of suspenseful media presentations, in terms of these factors, will provide a basis for evaluating the potential effects of prior information about a mediated threat.

In media presentations, the characteristics of potentially threatening events are often ambiguous. In many cases, disturbing events may be regarded as possible or even likely (based on the genre of the program, for instance), but their occurrence is nonetheless uncertain. In some cases, viewers may know that a particular event is going to occur (e.g., an event in a well-publicized film), but they rarely know exactly what the event will be like (such as how graphic a depiction will be). The precise timing of threatening events in media presentations is usually unknown as well. Even if viewers know that a certain event will occur, and have heard detailed descriptions of what will happen, it is difficult to predict the exact moment when the event will occur. Yet events rarely take viewers completely by surprise. Scary events, in particular, are often preceded by narrative cues indicating that the events are imminent. Cues may precede the events they signal by long periods of time, however, apparently in an effort to increase suspense and fear among viewers (Norden, 1980).

An analysis of the ways in which a threat forewarning would affect interpretations of threat-related media events suggests that prior knowledge of a threat should be an ineffective fear-reduction strategy. First, a description of the details of a scary event, without information designed to minimize danger, would tend to emphasize the threatening aspects of the event and increase the perceived severity of the threat. Second, a threat forewarning would make the occurrence of the threat certain, rather than possible or completely unexpected. Assuming that the threat has an unknown outcome, a negative outcome should seem more likely if a threatening event is certain to occur than if it is merely possible. Thus, within the context of a suspenseful media presentation, an anticipated threat should engender more fear if it is certain rather than uncertain (Zillmann, 1980). Third, knowledge of a scary event may lead viewers to interpret ambiguous cues as indications of the upcoming threat. This could lengthen the anticipation period by leading to the recognition of threat cues earlier in the program. Since viewers have little way of knowing precisely when an expected event will occur, narrative cues that signal the imminence of a threat should act in much the same way as a warning signal that predicts the occurrence of shock; although the exact timing of the actual event is unknown, threat-related cues could repeatedly suggest that the event is about to occur. Thus, the research reviewed in the preceding sections suggests that prior information about a mediated threat would lead to more fear, earlier in the program.

It is possible that prior knowledge of a threat could allow viewers time to prepare that would be unavailable to those without prior knowledge (cf., Folkins, 1970). However, in the context of viewing a media presentation, it seems unlikely that a threat forewarning would substantially increase the use or effectiveness of either physical or psychological coping strategies. Physical strategies for regulating fear, such as looking away from the screen or gripping the arm of a chair, must be enacted at the exact moment that a frightening event transpires. Knowing *that* a threat will occur (but not precisely when it will occur) is unlikely to improve viewers' use of such strategies.

With regard to cognitive strategies, there is much evidence that viewers are capable of modifying their emotional responses to media presentations through cognitive means (Cantor & Wilson, 1984; Koriat, Melkman, Averill, & Lazarus, 1972; Lazarus & Alfert, 1964; Lazarus et al., 1965). However, the fact that subjects who are instructed to use coping strategies are generally less emotionally aroused than uninstructed subjects indicates that most viewers do not use such strategies effectively on their own. This may be because viewers are usually motivated to attend to entertaining media presentations, especially when they are concerned about characters in jeopardy. Thus, people should be less likely to distract or distance themselves from frightening media events than to use similar strategies in real-life stressful situations.

To summarize, the research reviewed above indicates that forewarning of a threatening media event should increase anticipatory fear and arousal. In addition, some evidence indicates that a threat forewarning may enhance emotional responses to a threatening event. As noted above, studies of stressor expectation typically show large increases in physiological arousal during anticipation periods, especially when threatening events seem imminent (Breznitz, 1967; Epstein & Clarke, 1970; Folkins, 1970; Nomikos et al., 1968; Spacapan & Cohen, 1983). Much theory and research indicates that emotions associated with higher levels of arousal are experienced more intensely (Zillmann, 1978). Thus, the build-up of physiological arousal during anticipation may intensify the impact of the frightening scene when it occurs (cf. Katz & Wykes, 1985).

This "excitation transfer" hypothesis has also been extended to predict responses to the happy ending. Zillmann (1980) has argued that high levels of suspense (and associated arousal) intensify viewers' happiness in response to satisfying narrative resolutions. Thus, the arousal associated with increased fear may intensify happiness in response to the happy ending. However, the transfer of arousal requires a cognitive switch from fear to happiness, which may not occur as readily among children, especially younger ones, as it does among adults (Barden, Garber, Duncan, & Masters, 1981; Barden, Garber, Leiman, Ford, & Masters, 1985). Moreover, among children (and perhaps some adults), the compelling depiction of a threatening event may produce persistent fear-related thoughts that even a happy outcome cannot entirely dispel. Previous research showing the transfer effect among children used relatively mild suspenseful presentations, which undoubtedly produced low levels of fear (Zillmann, Hay, & Bryant, 1975). Based on this reasoning, an alternative expectation is that a threat forewarning may not intensify, and may even interfere with, happiness in response to a successful resolution of the threat. The design of the present study permits an evaluation of these possibilities.

Reasons for Expecting Developmental Differences

A forewarning that deals with the endangerment of a media character would be expected to increase fear to the degree that the viewer is able to anticipate the occurrence of a verbally presented threat and imagine the possible consequences (e.g., death or injury to a character). In addition, the more general capacity for utilizing prior knowledge should be related to the influence of forewarning on subsequent emotions.

Anticipating events. There seems to be little research specifically dealing with the development of children's ability to anticipate events or to experience anticipatory emotions. There is evidence that much cognitive activity depends on expectations about future events and experiences (Piaget, 1971; Schank & Abelson, 1977), and that emotions may arise in response to expectations (e.g., Spacapan & Cohen, 1983). Even infants are able to anticipate simple environmental events (Haith, Hazan, & Goodman, 1988), and young children regularly experience anticipatory emotions (e.g., distress as mother or father prepares to leave; Izard, 1977; Sroufe, 1979). Sroufe (1979) argues that as children develop cognitively, they become better able to anticipate outcomes before they occur. The anticipatory emotions of young children seem to be emotions that have occurred repeatedly in response familiar, self-relevant events. It is undoubtedly a much more difficult process to imagine a novel, vicarious situation in sufficient intensity to elicit an anticipatory emotional response. For example, Ultee, Griffioen, and Schellekens (1982) found that desensitization through imagining a feared situation was unsuccessful in reducing fears in a group of children aged 5 to 10 (relative to actual exposure). They reasoned that children in this age range had difficulty imagining themselves in the situation, and anticipating the consequences of the situation. There is much evidence that children become more proficient with age at generating and manipulating mental imagery (see Mandler, 1983, for review).

In a related area of research, Hoffman (1982) discusses the development of anticipatory guilt, or guilt about something that has not yet been done. He contends that anticipatory guilt requires the capacity to visualize both an act that has not yet been performed and the other person's probable distress response. Hoffman describes this process as highly cognitively demanding. Similarly, Derryberry and Rothbart (1984) contend that as the child's representational capacity develops, he or she becomes better able to anticipate the consequences of events. Emotional responses are thus freed from control by the immediate context, and may be elicited by "events ranging across broad time frames (p. 150)." Thus, although there is no clear indication of when children should begin to experience emotions in anticipation of novel events, the evidence suggests that the fear-inducing effects of a threat forewarning should increase with age.

Use of prior knowledge in comprehension. It is well established that what one knows affects what will be understood from passages (see Anderson & Pearson, 1984). Generally knowledge is considered to be the semantic base that children have acquired, and studies have examined how level of knowledge about a topic influences what children understand and remember. A few studies have also experimentally manipulated preexisting knowledge to see how prior knowledge influences comprehension. This has been done with children (Brown, Smiley, Day, Townsend, & Lawton, 1977) as well as with adults (e.g., Bransford & Johnson, 1972; Owens, Bower, & Black, 1979; Pichert & Anderson, 1977).

Research with adults has clearly shown that prior information influences how subjects interpret and remember passages. In one study, Owens et al. (1979) had subjects read a dull story about a character engaging in five neutral activities. However, subjects first read one of two prefaces that revealed a problem/concern of the character. Both recall and recognition memory for the story content was strongly influenced by the preface subjects had read. Subjects interpreted "neutral" events in terms of their relevance to the character's problem. In another study, Pichert and Anderson (1977) had subjects read a story about a boy showing a friend around his house. Subjects were instructed to read the story from the perspective of either a burglar or a home buyer, and their recall of the events in the story clearly reflected the perspective they had adopted.

Research suggests that differences in the performance of younger and older children on a variety of tasks may be due not only to knowledge differences between the two groups, but also to differences in the ability to access and apply knowledge that both groups possess. Having knowledge that is relevant to a task does not necessarily mean the child will apply it effectively (see Brown, Bransford, Ferrara, & Campione, 1983). The tendency for children to access relevant information spontaneously increases developmentally (Brown & Campione, 1981).

There is some evidence that the influence of prior knowledge on children's comprehension also increases with age. Brown et al. (1977) found that provision of a prior framework for interpretation influenced comprehension and memory for prose among children as young as second and third grade. In two separate studies, children at three grade levels (between grades 2 and 7) heard one of two introductions before reading and recalling a story. The story contained ambiguous phrases that could be interpreted according to the prior information provided about the events. The proportion of intrusions relevant to the orienting framework increased with age. However, the recall protocols of subjects at all three grade levels showed the influence of prior information. Despite the developmental trends observed in the studies, the authors emphasized that subjects as young as second and third grade used prior information to interpret ambiguous prose passages. However, they noted that as children mature, they become more flexible in their ability to use knowledge frameworks to make ambiguous texts more comprehensible. This developmental trend was reflected in an increase in theme-related intrusions in recall. It seems likely that children younger than second grade would have been even less affected by the prior interpretive framework.

To summarize, there is some evidence that younger children may be less influenced by a threat forewarning than older children. With development, children become better able to anticipate novel events and respond to situations that are not immediately present. Children's interpretations also increasingly reflect the influence of prior information. Thus, although even young elementary school children seem to have some degree of competence in anticipating events and applying stored information to new situations, the data suggest that their performance improves with age.

Prior Knowledge of a Happy Outcome

Intuitively, it seems likely that prior knowledge of a positive resolution would reduce fear during a threatening sequence, possibly by casting the events in a less threatening light. A "happy outcome" generally refers to a resolution that has significant positive consequences for a liked character or negative consequences for a disliked character (Zillmann, 1980). There is no distinct body of literature that deals with how prior information about this type of resolution may be able to modify responses to a threat. However, by considering the process by which knowledge of a happy outcome should affect fear responses to a media presentation, it is possible to identify related areas of research.

There seem to be three classes of relevant research. First, some of the studies reviewed in the previous section bear directly on how positive information about a threat may influence appraisal processes and emotional responses. Knowledge of a positive outcome may alter how a potentially threatening event is initially appraised. Furthermore, a threat appraisal may be modified if happy outcome information is used to reappraise the event. A second area of research is less directly related, but indicates that outcome expectations influence emotional responses. This research deals with expectations about life experiences that have the possibility of ending in either success or failure (e.g., a speech, surgery). Finally, a few media studies have examined the role of a happy ending in modifying responses to suspenseful films.

Review of Relevant Research

In general, prior knowledge of a happy outcome could function in much the same way as any type of information that suggests a positive interpretation of a threatening event. Research reviewed in the previous section showed that information that reduced the threatening aspects of an event, such as knowledge of safety features of shock apparatus, reduced fear responses (Epstein, 1973; Leventhal et al., 1979). In Lazarus and Folkman's (1984) terms, individuals who heard this information may have appraised the upcoming event as less threatening.

In addition, if viewers know that a frightening program will end happily, they may be able to use this information to reappraise threatening events (as less threatening). This use of happy outcome information is consistent with Lazarus and Folkman's (1984) description of reappraisal as an emotion-focused coping strategy. Many studies have shown that altering one's perspective on media events can reduce negative emotional responses to frightening or disturbing depictions (e.g., Cantor & Wilson, 1984; Koriat et al., 1972; Lazarus & Alfert, 1964; Lazarus et al., 1965; Speisman et al., 1964). For example, in the study by Lazarus and Alfert (1964), subjects were told that an apparently painful circumcision rite was actually an important rite of passage that was enjoyed by the participants. This introduction reduced viewers' skin conductance and heart rate, as well as their reports of negative mood.

In a related study, Langer et al. (1975) examined the effects of two pre-surgical communications. One message encouraged patients to reinterpret the unfavorable aspects of hospitalization and to concentrate on positive consequences (e.g., extra attention, the opportunity to relax). The other message described the procedures and discomforts the patient would experience. Patients who were encouraged to reinterpret their experience in positive terms showed less preoperative anxiety (nurses' ratings) and made fewer requests for drugs after surgery, compared to a control group and the group that received the preparatory information.

Some support for the beneficial effect of prior knowledge can also be drawn from research on expectations about life experiences. There is much evidence that the expectation of positive or negative outcomes is related to emotional responses in a variety of real life situations (e.g., Greene & Sparks, 1983; Manning & Wright, 1983). Fear associated with medical or dental procedures or phobias can be reduced by exposure to successful models, and one of the factors underlying this effect seems to be the change in outcome expectations: fear is reduced when positive outcomes seem likely (Bandura, 1986). Most of the research in this area deals with outcomes that are contingent on the individual's behavior, and thus the effect of expected outcome is closely related to feelings of self-efficacy. As noted above, viewers are incapable of altering the outcome of threatening media events. However, knowledge of the outcome should still contribute to reducing emotional responses, and may actually allow viewers to feel some minimal degree of cognitive control over the events (cf. Weisz, 1986).

Research on responses to the mass media provides some additional information regarding the potential benefit of prior knowledge of a happy outcome. Freidson (1953) argued that the knowledge that "good guys" typically triumph over villains tends to reduce emotional responses to suspenseful programs. Although he presented no relevant data, he suggested that the ability to predict the outcome of a program interferes with tension and excitement. Support for this hypothesis is provided by what appears to be the only study that manipulated prior knowledge of the outcome of a media presentation. In this study (Comisky & Bryant, 1982), which was discussed above, subjects received different information regarding the probability that a threatened film character would escape harm. Subjects who were told that the character was certain to escape rated the program as less suspenseful than subjects who were told that his chances of escaping were moderate or low. Although emotional responses to the film were not assessed, it seems likely that subjects who viewed the less suspenseful sequence also experienced less worry or anxiety about the character's fate.

There is some evidence that actual exposure to a happy ending reduces adults' negative emotional responses to upsetting films. In one study, Tannenbaum and Gaer (1965) exposed subjects to a segment from a film in which the protagonist undergoes a disturbing experience (he is about to be hanged). Subjects then saw one of three endings (happy, sad, or ambiguous) or no ending at all. All subjects experienced an increase in stressful mood state following the disturbing sequence. Relative to these ratings, the happy ending significantly reduced stress, and the sad ending significantly increased stress. However, even in the happy-ending condition, subjects were in a more negative mood state than they had been prior to viewing the movie. Thus, the happy ending reduced subjects' negative affect, but not enough to return them to their pre-viewing state.

In another study, Zillmann, Johnson, and Hanrahan (1973) exposed adult subjects to an aggressive film that either had a happy ending or had no ending. The happy ending induced relaxation, and resulted in significantly less aggression against a confederate who had previously angered subjects. The authors note that the happy ending both resolved all conflicts and produced an outcome that satisfied the main protagonists in the film. They speculate that an ending that resolves conflict, regardless of whether it is happy, may have the same relaxing effect.

Overall, there is little research that directly pertains to the emotional consequences of prior knowledge of a happy outcome. Research indicates that information that suggests a positive interpretation of a threat can reduce fear and arousal, perhaps by encouraging reinterpretation of the event. In a related area, the expected outcomes of real-life experiences have been shown to influence emotional responses. Finally, there is evidence that knowledge of a positive outcome reduces suspense, and that actual exposure to a happy ending reduces negative affect. Overall, the research in several related areas is consistent with the expectation that knowledge of a happy outcome will reduce fear responses to a frightening media sequence.

Application: Prior Knowledge of a Happy Outcome

In many circumstances, viewers may regard positive outcomes as very likely. The weekly episodes of most dramatic television series, for example, typically conclude with positive resolutions in which the liked characters succeed or at least emerge from danger without permanent injury. Movies are more likely to feature characters who experience significant harm, and the provision of unhappy endings appears to be quite frequent in horror films (Tamborini & Stiff, 1987). Nonetheless, Zillmann (1980) points out that even in predictable presentations such as television series, the possibility for injury or other harms exists. Furthermore, the eventual happy outcome may not be salient to viewers while they are witnessing the events. Prior knowledge of a happy ending would assure viewers that the characters will sustain no significant harm, and would also make the eventual happy resolution salient.

Lazarus and Folkman's (1984) discussion of appraisal and reappraisal provides some insight into how happy outcome information would be expected to influence emotional responses to a media presentation. Early in a program, before threatening cues have been recognized, knowledge of the outcome may influence viewers' interpretations of both ambiguous and threat-related cues (Jacoby & Kelley, 1987). For example, knowing that the program will end happily may make cues signalling an impending danger seem less threatening. In this way, prior knowledge should reduce anticipatory fear and arousal. Once threat appraisals have been made (e.g., while actually witnessing a frightening scene), prior knowledge of the happy outcome should enable viewers to consciously alter their interpretation of the events, thereby reducing fear.

In discussing the potential effects of a threat forewarning, it was suggested that transferred arousal (from fear) may intensify happiness in response to the positive outcome. Consistent with this view, if prior knowledge of a happy outcome reduces fear, then the corresponding reduction in arousal may lower happiness in response to the subsequent resolution. On the other hand, the experience of less intense negative affect may facilitate the cognitive switch from negative to positive thoughts.

Reasons for Expecting Developmental Differences

The ability to redefine or reinterpret events in new ways seems closely related to the ability to effectively apply information about a happy outcome. Research on a variety of tasks requiring cognitive redefinition shows that children's skill in this area improves with age. One of the factors that may underlie this development is an increase in children's working memory capacity. In addition, the ability to understand temporal relationships seems to be an important requirement for recognizing the implications of information about a program's conclusion, provided before the start of the show.

Cognitive redefinition. As noted above, adults and older children are able to view a media event from different perspectives, simply by being instructed to do so (Cantor & Wilson, 1984; Lazarus & Alfert, 1964; Lazarus et al., 1965; Speisman et al., 1964). However, younger children's emotional responses are not as easily modified by instructions to view a frightening event from a particular perspective. For example, in the study by Cantor and Wilson (1984), described above, instructions to focus on the unreality of the witch in a film scene reduced fear responses among older children, but not preschoolers. It is unclear whether the lack of effect among the preschoolers was due to their lack of understanding of the notion of unreality (although they could use the verbal label appropriately) or to their inability to keep the notion in mind while viewing the program.

In a related area, research has shown that mitigating information provided before an upsetting event reduces emotional responses to the event among adults (Johnson & Rule, 1986; Ziilmann & Cantor, 1976). However, there is evidence suggesting that young children's emotional responses may not be affected by such prior information. Pazer, Slackman, and Hoffman (1981) examined whether children's anger could be modified by knowledge of extenuating circumstances. Children were asked to indicate how mad they would be at someone who behaved in a harmful manner toward them (e.g., stole their cat). Some children heard extenuating information (e.g., the boy's cat had run away and his parents wouldn't get him another one) and some did not. Children who were 8 or older, but not younger children, reported that they would be less angry if they had heard the extenuating circumstances.

Research on methods for coping with chronic fears has also shown that verbal strategies suggesting a new perspective on a scary stimulus are generally less effective than other approaches among young children. In one study (Kanfer, Karoly, & Newman, 1975) 5- and 6-year-olds who were afraid of the dark were trained to rehearse one of three types of statements: sentences about the positive aspects of darkness (e.g., "the dark is a fun place to be"), sentences emphasizing personal competence (e.g., "I can take care of myself in the dark"), or neutral sentences. Both treatments increased the length of time the children tolerated total darkness, relative to children who rehearsed neutral statements, but the competence treatment was much more effective than the "positive thoughts" treatment. At a post test, children in the competence group stayed in the dark longer than those in either of the other groups. Siegel and Peterson (1980) successfully reduced preschoolers' fears of the dentist by teaching them to repeat positive phrases (e.g., "Everything is going to be alright") during treatment, but this strategy was used in conjunction with training in relaxation and positive imagery. Thus, its independent contribution to fear-reduction cannot be evaluated. Sheslow, Bondy, and Nelson (1983) compared the effectiveness of a verbal training procedure, graduated exposure to reduced lighting, and a combination of the two in reducing 4- and 5-year-olds' fear of the dark. The verbal training focused on teaching children that things that seem frightening in the dark, such as shadows and sounds, are really not scary. The authors found that tolerance of darkness increased only among children who received the graduated exposure treatment. They noted that Karoly et al. (1975) obtained some success with a verbal redefinition strategy, and attributed the difference between the studies to the fact that the children in their own study were slightly younger. It seems likely that the effectiveness of verbal strategies designed to alter interpretations of a stimulus depends in part on the cognitive capacity required to process the frightening stimulus itself. By the age of 5 or 6, children may be able to redefine a scary stimulus in situations that require very little cognitive involvement (e.g., sitting in the dark), but may not be able to do so when they are simultaneously engaging in another involving activity (e.g., watching TV).

Research on the development of delay of gratification can be interpreted in a similar way. A number of studies have shown that preschoolers are able to delay gratification by thinking about the rewards, which are present, in a nonconsumatory way (e.g., thinking of marshmallows as puffy clouds) (Mischel & Baker, 1975; Mischel & Moore, 1973). These studies suggest that even preschoolers have the cognitive capability to modify or transform objective evidence. However, young children's cognitive capacity is limited, and they may be unable to carry out such transformations when there are other cognitive demands (see Mischel, 1974).

Working memory capacity. The ability to successfully utilize happy outcome information while viewing a media presentation may require more cognitive capacity than young children typically have available. There is much evidence that the functional cognitive capacity of humans increases developmentally (see Brown et al., 1983, for review). The current view of working memory is that storage and processing functions share a limited capacity space. Case and his colleagues (e.g., Case, 1985; Case, Kurland, & Goldberg, 1982) argue that the total processing space remains the same throughout development, and that the increase in functional capacity is due to the increasing efficiency with which cognitive operations are executed. As the amount of operating space required for performance decreases, the amount of available storage space increases, thus effectively increasing capacity. Since younger children undoubtedly need to devote more capacity to processing a narrative, they would be expected to have less capacity for storing potentially important information in working memory. These children should be less likely than older children to make connections between new and previously stored information, because much of the "old" information would be inaccessible, in long term memory. In other words, they should be less likely to make inferences, and less likely to use prior information to help interpret new material.

There is also evidence that the ability to allocate processing capacity to several tasks improves developmentally (Manis, Keating, & Morrison, 1980). The process of reinterpreting an ongoing event on the basis of information stored in memory requires that the child attend simultaneously to internal and external stimuli. In a related task, Mackworth (1976) examined children's ability to use information in memory to guide their search of visual displays. She concluded that the poor performance of the younger children was due to their inability to "maintain inward and outward attention simultaneously" (p. 125).

Based on the above analysis, it seems that it should be difficult for younger children to process a frightening media presentation, and simultaneously 1) keep in mind their knowledge of a happy outcome, and 2) use that knowledge to modify their interpretation of the frightening event. In fact, the emotionally-arousing nature of a frightening show should make the process of modifying an ongoing event with prior information even more difficult.

Understanding of temporal order. Utilizing prior information about the resolution of a story requires not only that the child keep the outcome in mind while viewing, but also that the child understand temporal sequences (e.g., that the resolution follows the attack, even though it is mentioned beforehand) (see Fivush &

Mandler, 1985; Schmidt & Paris, 1978). Story events are sometimes presented in temporal or "real time" order. However, events are often arranged in other ways (e.g., by including flashbacks or flashforwards) for the purpose of creating dramatic interest (Brewer & Lichtenstein, 1982). In order to comprehend a story, it is necessary to infer the "underlying event sequence," which may differ from the order of presentation.

Research has shown that it is more difficult even for adults to make judgments about the underlying order of events in sentences or stories when the presentation order differs from the "real time" order of events (e.g., flashbacks) than when the two orders are the same (see Baker, 1978). However, studies have shown that adults are able to reorganize and understand stories with unconventional or disorganized structures (e.g., Stein & Nezworski, 1978). Young children have difficulty comprehending and remembering stories and television shows when the events are not arranged chronologically (e.g., Buss, Yussen, Mathews, Miller, & Rembold, 1983; Collins, Wellman, Keniston, & Westby, 1978; Poulson, Kintsch, Kintsch, & Premack, 1979).

In one study (Buss et al., 1983), subjects in second grade, sixth grade, and college heard stories in either a standard order or a scrambled order, and were asked to recall the stories either exactly as heard or by making them into "good" stories. There was a clear improvement across grade level in the ability to reorganize the scrambled stories. For sixth graders and college students, recall organization of the scrambled stories was much better under make-a-story instructions than under exact-recall instructions, but for second graders, there was no difference between the two conditions. However, after brief training in how to sequence stories correctly, the second graders were able to do so. The authors argue that children in early elementary school know the categories in an ideal story (e.g., initiating event, consequences), but need prompting to consciously use this knowledge to reorganize a scrambled story. One reason for this finding may be the fact that children have difficulty consciously manipulating the contents of their memory (Piaget & Inhelder, 1973; Salatas & Flavell, 1976). The fact that second graders had difficulty reorganizing story events without special training suggests that young children are unlikely to mentally construct the underlying story structure *while* reading or viewing a narrative with a nonstandard structure.

Thus, it is clear that the ability to understand events that are not presented in the order of occurrence improves with age. Young children, in particular, should have difficulty in recognizing that a frightening event actually precedes the happy resolution if the resolution is presented first. Thus, older elementary school children should benefit more than younger children from hearing that a frightening show will end happily.

Combination of Threat Forewarning and Happy Outcome Information

There is little research to suggest whether the threat forewarning and the happy outcome information should have an additive or interactive effect on fear. It is possible that the two types of information may act independently, with the threat forewarning enhancing fear and knowledge of the happy outcome reducing it. There are also several ways that the two types of information could interact. Of course, an interaction would be expected only if subjects utilize both types of information to some degree.

First, the threat forewarning may overwhelm the fear-reducing effect of the happy outcome information. Certain aspects of a frightening presentation, such as contextual cues, may evoke emotional responses relatively automatically. Thoughts of an upcoming scary event may occur in a similar way. Reduction of emotion through reappraisal, in contrast, requires conscious effort.

Alternatively, the beneficial effect of the happy outcome information may be enhanced by combining it with information about the threat. Knowledge of a happy outcome can reduce fear only if viewers make the connection between the threatening event and the reassurance of a happy outcome. Combining the two types of information may have the effect of placing the happy outcome in context, thus enhancing subjects' comprehension and ability to apply the information (cf. Bransford & Johnson, 1972).

Finally, it seems possible that assurance of a happy outcome may reduce the fear-producing effect of a threat forewarning. In other words, a threatening event may not seem very threatening if it is known in advance that the outcome will be positive. Consistent with this possibility, Comisky and Bryant (1982) found that subjects who were told about the threat faced by a character, but who were assured that he would be able to escape, felt very little suspense during the program. As noted above, however, fear responses were not assessed in that study.

Overview of the Present Study

The present investigation examined the influence of prior information about a threatening media event and its happy resolution on children's emotional responses to a media presentation. Very few studies have examined the effects of either of these variables on fear responses or suspense, and no studies have done so with children. Both forewarning of a threat and prior knowledge of a happy outcome were considered in terms of their ability to reduce or prevent media-induced fear. The review of the literature related to forewarning of a threat, however, clearly demonstrated that this type of information should increase, rather than reduce, fear responses to a scary media presentation. Research on the development of anticipation and the use of prior knowledge in comprehension suggested that the fear-inducing effect of a threat forewarning may increase with age. Despite the lack of relevant research, prior knowledge of a happy ending seems likely to function as an effective fear reduction strategy. However, the use of such knowledge may be beyond young children's capabilities. Specifically, problems of limited working memory capacity and incomplete understanding of temporal order are likely to reduce young children's ability to redefine ongoing scary events in light of an eventual happy ending. Thus, the fear-reducing effects of prior knowledge of a happy ending should increase with age.

In the present study, children at two age levels heard one of four audiotaped introductions to a film sequence, created by factorially varying descriptions of the threat and the happy outcome: threat only, happy outcome only, threat plus happy outcome, or neither type of information. Children then viewed the program, in which a character confronts a life-threatening situation and eventually escapes unharmed. He is safe and happy as the program ends. The sequence was edited so that the threatening scene was preceded by ambiguous cues that could be interpreted as signalling a threat. Half of the children saw the entire program intact, and half of the children did not see the happy ending until after they reported on their responses to the program. The timing of the ending was varied to obtain children's predictions of the outcome, and to determine the importance of a happy resolution in children's enjoyment of suspenseful films (addressed in Chapter Three).

Children's facial and physiological responses were recorded continuously during the program. After viewing, children reported on their emotional reactions during several scenes, and indicated when during the program they first began to worry about the threatened character. Based on the research reviewed in this chapter, the following hypotheses were advanced:

H_1: Forewarning of the threat will increase fear before and during the frightening scene, and will produce worry earlier in the program (relative to children who are not forewarned). The effects will be stronger among older children than among younger children.

H_2: Prior knowledge of the happy outcome will reduce fear before and during the frightening scene (relative to children who do not know about a happy outcome). The effects will be much stronger among older children than among younger children.

In the discussion of the influence of a threat forewarning on media-induced fear, it was noted that the increased arousal associated with fear may intensify happiness in response to the subsequent happy ending (Zillmann, 1980). This effect would be expected only for subjects who view the ending as a continuous part of the program. However, it was also considered possible that the cognitive switch from negative to positive may not occur as easily among children, especially those in the younger group (Barden et al., 1985). Similar arguments were made regarding the possibility that prior knowledge of the happy outcome would reduce happiness in response to the positive resolution (by lowering fear and associated arousal during the preceding scene). Thus, the following research question was advanced:

> RQ_1: How will forewarning of the threat and prior knowledge of the happy outcome influence happiness in response to the happy ending? Will the effects differ for the two age groups, or according to the timing of the ending?

There was little theoretical or empirical evidence to guide the formation of a specific hypothesis regarding the combined effects of the two types of prior information. Thus, a second research question was advanced:

> RQ_2: What will be the effect of the combination of forewarning of the threat and prior knowledge of the happy outcome? Will the two types of information function independently or will they interact?

CHAPTER THREE

Enjoyment of Suspenseful Presentations

The research reviewed in Chapter Two dealt with the influence of a threat forewarning and prior knowledge of a happy outcome on emotional responses to a frightening media sequence. In addition to altering emotional reactions, prior information about a suspenseful presentation may influence the degree to which viewers enjoy the program. At least among subjects able to utilize prior information, forewarning of a threat should increase suspense by leading forewarned subjects to anticipate the threat earlier in the program than subjects who are not forewarned. Conversely, knowledge of the happy outcome should reduce suspense by making the possibility of a negative outcome effectively zero (Zillmann, 1980). Understanding the relationship between suspense and enjoyment may give some indication of the practical utility of providing prior information as a coping strategy. Specifically, viewers are unlikely to utilize coping strategies that reduce their enjoyment of media presentations. Thus, children's enjoyment of the frightening program was examined as a function of the prior information they received about the events. Before describing the specific questions addressed by the present study, the research on suspense is reviewed, and two studies that have dealt with children are discussed.

Media presentations designed to frighten or horrify viewers are a popular form of entertainment, and survey evidence indicates that such offerings are enjoyed by many viewers (e.g., Cantor & Reilly, 1982; Palmer et al., 1983; Wilson, et al., 1987; see Cantor, in press). Given that fear and terror are dysphoric emotional states, it seems surprising that viewers would enjoy such fare. Several explanations for this phenomenon have been proposed, but the two that have been discussed most frequently in the social science literature have focused on the enjoyment of successful resolutions, and enjoyment of the thrills and excitement provided by frightening presentations.

Satisfying resolutions certainly seem to contribute to viewers' enjoyment of frightening films. Tamborini and Stiff (1987) interviewed people leaving a theatre about their reasons for liking horror films such as the one they had just viewed. The researchers found that one of the main predictors of liking for horror films was the provision of a just resolution ("the good guy wins in the end"). Himmelweit, Oppenheim, and Vince (1958) argued that children like mildly frightening programs because they enjoy the relief that follows the resolution of suspense. Consistent with this observation, a recent study (Cantor & Hoffner, 1988) found that 3- to 11-year-olds frequently mentioned relief from threat or danger as a reason that movies or television programs had made them feel happy.

Enjoyment of successful resolutions has been closely linked to the arousal and reduction of suspense. Zillmann (1980) argues that arousal from suspenseful media sequences carries over and intensifies the positive response to a happy ending, thus producing a highly rewarding, positive emotional experience. The removal of the threat alone should not be sufficient to produce this effect, because some condition must be present to prompt the switch from a negative to a positive state. Conversely, if the resolution is unhappy and produces sadness or disappointment, residual arousal from suspense should intensify dysphoria (Zillmann, 1978). Zillmann (1980) describes several unpublished studies that support the proposed relationship between suspense and enjoyment. The studies manipulated both the degree of suspense and whether or not the threat was resolved satisfactorily. It was found that when the resolution was satisfying, a high level of suspense produced greater enjoyment, but when the resolution was unsatisfying, enjoyment was low for both high and low suspense.

This research supports the view that degree of suspense is an important determinant of enjoyment, with greater suspense associated with greater enjoyment of a successful resolution. There are at least three factors that may influence suspense, and therefore liking, of a program with a happy ending: (1) degree of outcome uncertainty; (2) degree of foreshadowing (e.g., narrative cues signalling an upcoming threat); and (3) degree of liking for the endangered character.

Some degree of outcome uncertainty, usually regarding the possibility of harm or misfortune, appears to be necessary for the experience of suspense (Comisky & Bryant, 1982; Zillmann, 1980). Comisky and Bryant (1982), for example, reported that ratings of suspense were very low when an endangered film character was described beforehand as certain to escape harm. The lower the probability that the character would escape, the more suspenseful subjects found the presentation, as long as some possibility for escape remained. Brewer and Lichtenstein (1981, 1982) made a similar point regarding outcome uncertainty in their structural-affect theory of stories. They reasoned that suspense is aroused as the reader becomes concerned about the outcome of the events, and that if the outcome is revealed early in a narrative, suspense will be reduced or eliminated. In a recent study (Brewer & Lichtenstein, 1981), they tested their ideas by organizing the same story events in different ways. They found that suspense-misarranged narratives, which began by stating the outcome of threatening events, produced less suspense and were liked less than narratives arranged in the standard suspense format (with the outcome at the end).

Foreshadowing of events seems to be a staple of suspenseful films (Norden, 1980). The ability of cues to arouse anticipatory emotions was noted above (Lazarus & Folkman, 1984). Lazarus and Alfert (1964), for example, created suspense in a film by inserting scenes that foreshadowed the occurrence of disturbing scenes of bodily injury. The study by Cantor et al. (1984), reported earlier, found that forewarning of a threat increased fear responses among adults. They concluded that "a frightening event that is strongly foreshadowed earlier in the plot would seem likely to produce a more intense emotional reaction in the audience than a totally unanticipated turn of events" (p. 31).

Brewer and Lichtenstein (1981) also proposed that suspense should be heightened by the foreshadowing of threatening events. In the study reported previously, they included suspense-foreshadowed narratives as well. In these stories, readers were forewarned about complications that the characters would encounter, which might prevent them from escaping an impending threat (e.g., a bomb about to explode). Contrary to predictions, these narratives did not produce greater suspense or liking than narratives in the standard suspense format, but the authors attribute this finding to difficulties in constructing the stories. In general, it seems that cues signalling threat or scenes that foreshadow threatening events increase suspense.

Liking for endangered characters is another important factor determining the degree of suspense (Zillmann, 1980). According to Zillmann, affective responses to media presentations are partially a function of the viewer's disposition or affect towards the characters (Zillmann, 1980; Zillmann & Cantor, 1977). Consistent with this view, research has confirmed that the level of suspense viewers feel depends on how much they like the endangered characters (e.g., Comisky & Bryant, 1982; Zillmann, 1980). Specifically, liking is positively associated with suspense. For example, in Comisky and Bryant's (1982) study, liking for the main character was manipulated by presenting a prologue that depicted him in a neutral, mildly positive, or strongly positive manner. When the character was endangered, the degree of suspense reported by viewers was positively related to their liking for him.

Several factors have been shown to influence suspense. One important consideration, however, is the degree to which enjoyment of suspenseful films depends on a successful resolution of a threat. Although a happy resolution may enhance enjoyment, this explanation cannot account for enjoyment of films that do not end happily. Many current horror films show sympathetic protagonists undergoing severe trauma and dying in brutal, terrifying ways. Tamborini and Stiff (1987) refer to this as the "unhappy-ever-after" format. In their survey of film goers, they found that the desire to see graphic portrayals of destruction was an even stronger predictor of liking for horror films than was the desire to see satisfying resolutions. Other researchers have obtained evidence suggesting that people like frightening films because they provide vicarious thrills and excitement, or because they are novel and unpredictable (Sparks, 1986a; Tamborini, Stiff, & Zillmann, 1987). These characteristics seem to be enjoyed independent of how the presentations are resolved. Thus, it seems that both successful resolutions and characteristics of the frightening events themselves (e.g., destruction, excitement, or novelty) may contribute to enjoyment of frightening media presentations.

Very little research has examined children's responses to suspenseful presentations. In what appears to be the only mass media study of children's responses to suspense, Zillmann et al. (1975) showed 7- and 8-year-olds one of several versions of an animated adventure program about two boys hunting a lion on safari in Africa. The programs differed in level of suspense (low, medium, and high, manipulated by increasing the dangerousness of the lion), and presented either a satisfactory resolution (the boys kill the lion) or an unsatisfactory resolution (the lion escapes). The authors found that liking for the program increased as the degree of suspense increased, and this effect was stronger when the suspense was satisfactorily resolved. Although they had not expected any differences in liking for the program with an unsatisfying resolution, they noted that the concluding events in that version may have been somewhat satisfying because the characters escaped harm at least temporarily.

In a recent study (Jose & Brewer, 1984) children in second, fourth, and sixth grade read or listened to suspense stories and rated them on a variety of variables. Each story involved a significant event, in which the main character was either endangered or lost something valuable. The stories varied in terms of the character's personal attributes (good, bad) and the type of outcome he or she experienced (positive, negative). Suspense was operationalized as the degree of worry subjects reported feeling about the character. Ratings of liking for the character, the ending, and the story were obtained (in addition to other measures). A path analysis showed that, at all three grade levels, liking for the character was positively related to suspense, and to liking for the outcome and the story. Among fourth and sixth graders, degree of suspense also contributed directly to liking of the story, with greater suspense leading to greater liking. For sixth graders, suspense predicted liking for the outcome as well. There was no direct link between suspense and liking among second graders.

The path analysis, however, obscured potentially interesting interactions. Specifically, it seems likely that different patterns of results may have emerged for stories with positive and negative outcomes. For example, liking for a character would be expected to enhance enjoyment of a positive outcome, but not a negative outcome (cf. Zillmann & Cantor, 1977). The influence of suspense would also be expected to differ according to whether the resolution was positive or negative (cf. Zillmann, 1980).

To summarize, it appears that only two studies have examined children's responses to suspense within an experimental framework. Zillmann et al. (1975) manipulated suspense by varying the content of an animated program, and examined liking for versions that included satisfying vs. unsatisfying resolutions. Jose and Brewer used written stories as stimuli. They examined the degree to which enjoyment of the stories could be predicted by suspense and liking for the main character, among other variables. Although they included stories with positive and negative outcomes, they did not examine whether the predictor variables were related to enjoyment of the two types of stories in the same or different ways.

The present study extended this research in several ways. First, the study examined the degree to which children's suspense can be modified by varying two of the variables identified as critical in creating suspense: foreshadowing of threatening events and outcome uncertainty. Second, Jose and Brewer's approach to understanding enjoyment of suspenseful narratives was applied to media presentations. Third, predictors of enjoyment (cf. Jose & Brewer, 1984) were examined for resolved and unresolved endings separately. The importance of considering the nature of the ending was pointed out by Zillmann et al. (1975). Differences between the two types of endings were of particular interest because of evidence that enjoyment of scary films may not depend on a successful resolution of the threat (Tamborini & Stiff, 1987).

To examine the predictors of children's enjoyment, the following additions were made to the design of the main study. The nature of the program's ending was manipulated by eliminating the happy resolution from one version. Thus, half of the children in the study saw the entire program, including the happy resolution, and half saw the ending only after they reported on their responses. For the latter group, the program ended abruptly as the character appeared to be succumbing to the threat. Subjects rated their liking for the ending and for the program. Consistent with Jose and Brewer (1984), suspense was operationalized as degree of worry about the threatened character. To assess evaluations of the threatening nature of the content, independent of concern for the character, subjects rated the dangerousness of the threatening agent. Degree of liking for the character was also obtained.

This aspect of the study was exploratory, but general predictions were made on the basis of previous research. First, different patterns of results were expected to emerge for subjects who viewed the intact vs. the interrupted program. Based on the reasoning that arousal from suspense may intensify affective responses to a subsequent scene, it was expected that worry, danger, and liking for the character would be positively related to liking for the ending and for the program among subjects who viewed the happy ending, but negatively related to liking for the ending and the program among subjects who viewed the abrupt, unresolved ending.

There were also reasons to expect that responses to the two versions would differ for younger and older children. As argued in the previous sections, prior information about the threat and its resolution may have less influence on younger children. This possibility suggests that informing subjects ahead of time about a happy outcome will reduce suspense more for older children than for younger ones. Similarly, forewarning subjects about the threatening event should increase suspense more for older than for younger subjects. In Chapter Two, it was noted that the process involved in "relabeling" negative arousal as positive may not be as flexible in children, especially those in the younger group. However, suspense may be less intensely negative than fear, and therefore may be less likely to interfere with the transfer of arousal.

To summarize, the present study manipulated prior information about a threatening event that was expected to influence subjects' degree of suspense, and consequently to affect their enjoyment of the program. Ratings of suspense (worry), liking for the threatened character, and perceived dangerousness of the threat were obtained, and the relationships of these variable to enjoyment of a resolved and an unresolved program were compared. Possible age differences were also considered.

CHAPTER FOUR

Creation and Pretesting of Experimental Materials

A number of films were viewed in an effort to find one that could be edited to meet the requirements of the study. First, to examine the effects of forewarning of a threat, the film had to include a frightening scene that could be described verbally. In addition, the frightening scene had to be preceded by several nonthreatening scenes, so that the forewarned viewer would have an opportunity to anticipate the upcoming threat. Finally, the threat had to be resolved happily, and in a way that would allow the threat and the resolution to be separated through editing. *The Swiss Family Robinson* (Disney, 1960) included scenes that could be edited to meet these experimental requirements.

All of the material in the edited version was in the original film, but the scenes were selected and organized to meet the requirements of the study. The entire experimental film lasts 4 min 50 s. In the initial scene, two teenaged brothers, Fritz and Ernest, are shown swimming and playing in a waterfall with other family members. This scene (the "playing" scene, 56 s) was selected to interest subjects in the program and to familiarize them with the characters. Everyone in the scene appears to be having a good time. The boys are next shown as they prepare to leave on a trip with a friend in a small boat (the "leaving" scene, 54 s). The boys seem to enjoy the preparations for their journey, and the other members of their family seem happy as well. The scene ends as the boys bid their parents goodbye and the mother warns the boys to be careful. There is nothing in the scene that could be interpreted as threatening or dangerous. The next scene (the "sailing" scene, 52 s) shows the boys sailing calmly on several bodies of water. This sequence contains no overtly threatening events, and is accompanied by relaxing background music. However, the mother's warning, the lull in activity, and the fact that the boys are alone on an open sea could suggest that a dangerous event may be imminent. This scene ends as the boys arrive on a beach and begin walking inland. In the next scene (the "wading" scene, 26 s), the boys and their friend are shown wading through a dark, swampy river. They appear cautious and the scene is accompanied by suspenseful music. Suddenly, a large snake surfaces and begins to attack Fritz. In this scene (the "snake" scene, 42 s), the snake wraps itself around Fritz's neck and body and repeatedly pulls him under the water. The original film includes the reactions of the other characters to the attack, but these were eliminated from the edited sequence. In addition, to lengthen the snake scene, several shots of Fritz struggling with the snake were included in the scene twice. Because the sequence is edited rapidly and shows the struggle from many angles, it is not obvious that several shots are repeated. Finally, in the concluding sequence (the "homecoming" scene, 1 min), Ernest rushes over and quickly helps Fritz escape from the snake. The boys are then shown arriving home safely. They are greeted by their younger brother and their parents, who are overjoyed to see them. The scene ends happily as everyone exchanges hugs. One version of the videotape includes this entire sequence of events, uninterrupted. The other version is interrupted just before Ernest helps Fritz escape.

The manipulation of prior information was accomplished by developing different introductions to the film. The Control message introduced the characters and described the setting of the program, but made no reference to the snake or the happy outcome. The Threat message included both the "control" information and a description of the boys' encounter with the snake. No reference was made to the happy ending. The Happy Outcome message included the "control" information, as well as an assurance that the boys were capable and would be safe at the end of the show. This message did not specifically refer to any threat, but was intended to provide information that viewers would be able to relate to the snake scene as they viewed it. The Threat/Happy Outcome message included the "control" information, as well as both a description of the encounter with the snake and an assurance of a happy ending. The texts of the four messages are presented in Appendix A.

The introductory information was recorded by the author on reel-to-reel audiotape, and then transferred to videotape. To ensure that any condition differences could not be attributed to variations in vocal tone or word emphasis, each introductory component (control, threat, happy ending) was recorded only once. The four messages were created by editing the relevant components together in the appropriate order, with the exception that one transition sentence was recorded separately for the Threat/Happy Outcome version. The video component of the introductions consisted of a solid blue background.

Pretest of the Experimental Film

Subjects

Subjects were thirteen undergraduate students (M age = 22 years, 6 months) in communications classes at the University of Wisconsin-Madison.

Procedure and Dependent Measures

Subjects participated in small groups of 3 to 4 people. They were told that they would view a short television program and would then fill out a questionnaire about the show. Seven subjects viewed the entire program, and six subjects viewed the program without the happy outcome. Subjects were asked to refrain from making comments during the session. Before starting the videotape, the experimenter (a male graduate student) read a slightly modified version of the "control" introduction, to place the scenes in context.

When the program ended, subjects completed the questionnaire. First, subjects were asked to summarize what had happened in the program. They were instructed to mention all of the major events in the order in which they occurred. On the next page of the questionnaire, subjects evaluated the ending of the program. They were asked to indicate how successful the boys had been in overcoming the snake, and how satisfying they felt the ending of the program had been. Responses to these questions were made on 7-point scales, ranging from (1) not at all successful/satisfying to (7) very successful/satisfying. Subjects then described how the boys felt at the end of the show.

Results

The recall protocols of all 13 subjects included the following major program events, in the correct order: 1) family members have a good time together, swimming or playing in a waterfall; 2) the boys leave the island; 3) the boys wade in a river or swamp; and 4) one character is attacked by a snake. In addition, all seven subjects who saw the happy outcome noted a fifth event: 5) the boys defeat the snake and return home.

Both rating scales confirmed the effectiveness of the manipulation of the ending. As expected, subjects who saw the happy outcome considered the boys more successful in overcoming the snake ($\underline{M}$ = 5.7) than did subjects who did not see the happy outcome ($\underline{M}$ = 2.5), $\underline{t}$ (11) = 5.33, p < .001. Also as expected, the program that concluded with the happy outcome was judged to have a more satisfying ending ($\underline{M}$ = 4.9) than the program that concluded with the snake attack ($\underline{M}$ = 2.2), t (11) = 3.61, p < .005.

The two groups also differed in their descriptions of the boys' feelings. All seven subjects who saw the happy outcome described the boys' feelings as positive, and four specifically labeled their emotions as happy. Similarly, all six subjects who did not see the happy outcome described the boys' emotions as negative, and four specifically said the boys felt afraid.

Pretest of the Introductions

Subjects

Subjects were thirty-five undergraduates ($\underline{M}$ age = 22:5) drawn from the same population as those in the pretest of the experimental film.

Procedure and Dependent Measures

Subjects participated in small groups, and the sessions were conducted by the same experimenter who ran the first pretest. He told subjects that they would hear an introduction to a television program, and would then complete a questionnaire about their reactions to what they had heard. The number of subjects who heard each version of the introduction was as follows: Control, 10; Threat, 10; Happy Outcome, 7; and Threat/Happy Outcome, 8.

After listening to the introduction, subjects completed the questionnaire. First, they indicated how difficult the introduction had been to understand, using a 7-point scale anchored with the phrases "easy to understand" (1) and "hard to understand" (7). They also judged how interesting it had been, using a similar scale anchored with the adjectives "boring" (1) and "interesting" (7).

Subjects were then asked to make judgments about the types of information that had been conveyed in the introduction. The following instructions were given:

> Please read the following list of events. Decide the degree to which the introduction you heard indicated that each event would occur in the television program.

Judgments about each event were made on the following 5-point scale: *not stated or implied* (1), *weakly implied* (2), *implied* (3), *strongly implied* (4), or *explicitly stated* (5). The events were listed on the questionnaire in random order, but are listed below according to topic:

1. Two boys engage in several activities together.
2. One of the characters encounters some form of physical threat or danger
3. One of the characters is injured.
4. There is a tragic ending.

5. The characters escape from a threatening or dangerous situation.
6. One of the characters receives help from another.
7. The characters are safe at the end of the show.
8. There is a happy ending.

Results

Subjects' evaluations of the quality of the introductions were analyzed using one-way analyses of variance. The analyses revealed that the four introductions differed significantly in ratings of interest-value, $\underline{F}$ (3,34) = 3.37, p < .04, but not in perceived difficulty ($\underline{F}$ < 1). The introductions that included a description of the boys' encounter with the snake tended to be judged more interesting (Threat, Threat/Happy Outcome, both $\underline{M}$s = 3.1) than the introductions that did not refer to the snake (Control, $\underline{M}$ = 1.8; Happy Outcome, $\underline{M}$ = 2.1). None of the subsequent Scheffe comparisons was significant, however.

One-way ANOVAs were also used to compare the four groups' judgments of the degree to which the introduction indicated the occurrence of various events. The results of the analyses are presented in Table 1. The higher the score, the more explicit the reference to the event was judged to be.

The boys' activities were mentioned in all four versions of the introduction, and the item dealing with this event was the only one for which condition differences did not emerge.

Table 1

Pretest: Explicitness of Reference to Various Events in the Four Introductions

	Introductions				
Event	Control	Threat	Happy Outcome	Threat/ Happy Outcome	F value
Activity	4.4	4.5	4.6	3.9	.74
Threat	1.1_a	4.4_{bc}	3.7_b	4.9_c	47.53 ***
Injury	1.5	3.0	1.7	2.0	3.16 *
Tragic End	1.1_a	2.2_b	1.0_a	1.0_a	6.89 ***
Escape	1.4_a	2.2_{ab}	3.4_{bc}	4.5_c	14.17 ***
Help	1.7_a	2.2_a	4.3_b	4.9_b	18.01 ***
Safe	1.8_a	1.6_a	4.7_b	4.9_b	27.56 ***
Happy End	1.5_a	1.4_a	3.7_b	4.0_b	17.18 ***

* $p < .05$ *** $p < .001$

Note. ANOVAs were conducted for each event separately. Scores could range from 1, *not stated or implied*, to 5, *explicitly stated*. Means in the same row having no letter in their subscripts in common differ at $p < .05$ by the Scheffe test.

In general, the ratings confirm that the manipulation of prior information about the threat was successful. As expected, reference to a threat was judged to be most explicit in the Threat and Threat/Happy Outcome conditions. However, the Happy Outcome version was also seen as suggesting the occurrence of a threat, although to a lesser degree. This finding indicates that the notion of a threat was implicitly conveyed as a function of describing the happy ending. The adequacy of the threat manipulation was supported by the items dealing with injury and a tragic outcome. As expected, references to these events were judged to be more explicit in the Threat condition than in any of the other conditions. However, comparisons among conditions were significant only for judgments regarding a tragic outcome. The fact that subjects who heard the Threat/Happy Outcome version expected a threat but not a tragic outcome indicates that the information about the happy ending was conveyed successfully.

The item dealing with escape was the only one that combined both the notion of a threat and the assurance of a happy outcome. As expected, reference to escape was considered more explicit in the Threat/Happy Outcome version than in the Control or Threat versions. However, the relatively high score on this item in the Happy Outcome version again suggests that reference to a happy ending implies the likelihood of a threat.

The success of the Happy Outcome manipulation was strongly supported by ratings of the three items dealing with help, safety, and a happy ending. All three of these events were rated as significantly more explicit in the Happy Outcome and Threat/Happy Outcome versions than in the other two versions of the introduction.

Overall, the ratings indicate that the four introductions conveyed the intended information, although the suggestion of a threat was stronger than desired in the Happy Outcome version. Apparently, subjects felt that there would be no reason to mention a positive outcome unless some type of threat was present. Thus, it seems that the implication of a threat in the Happy Outcome version is unavoidable. However, children may be less likely than adults to make such an inference. In any case, the suggestion of a threat was perceived as significantly less explicit by subjects who heard the Happy Outcome version than by those who heard the Threat/Happy Outcome version.

CHAPTER FIVE

Method

Subjects

One hundred and eighty-six children at two age levels (88 5-7-year-olds and 98 9-11-year-olds) participated in the experiment. The younger group (*M* age = 6 years, 6 months; range = 5 years, 0 months to 7 years, 9 months) was composed of kindergartners and first graders, and the older group (*M* age = 10 years, 6 months; range = 9 years, 0 months to 11 years, 11 months) was composed of fourth and fifth graders. The majority of the children (167) were White, 12 were Black, 5 were Hispanic, and 2 were Asian. The children attended one of two elementary schools or a day care center, all in Madison, Wisconsin.

Within each age level, males and females separately were randomly assigned to conditions. The number of males and females was approximately equal for both age groups. All subjects received written parental permission before participating.

Design

Male and female subjects at two age levels (5-7, 9-11 years) viewed a movie sequence that depicted two teenaged boys' encounter with a large snake. One of four introductions preceded the film. The introductions were created by factorially varying two types of information: forewarning of the threatening event (forewarning, no forewarning) and prior information about the happy outcome (prior knowledge, no prior knowledge). In addition, some subjects saw the happy ending as a continuous part of the program (Intact version), whereas other subjects did not see the happy ending until after they had completed the dependent measures dealing with their responses to the program (Interrupted version). Thus, the study employed a 2 x 2 x 2 x 2 x 2 design, with the following factors: age level, sex, forewarning of the threat, prior knowledge of the happy outcome, and time of exposure to the happy ending. Table 2 presents the ns for each cell of the design.

Procedure

Prior to the experiment, parents received two copies of a permission letter that briefly described the purpose of the study, the content of the videotape, and the dependent measures to be employed (See Appendix B). The letter also invited interested parents to attend a meeting at the school, where they would have the opportunity to view the videotape, see the equipment, and discuss the study with the experimenter. It was emphasized that parents should not discuss the details of the experiment with their children until the study was completed. Parents who wanted their child to participate were to return a signed copy of the permission letter to the experimenter, either through the school or by mail in a stamped, self-addressed envelope.

Orientation. Before testing began, each class that was to participate attended an orientation session designed to

Table 2

Distribution of Subjects by Age Level, Sex, Program Version, and Condition

	Condition			
	Control	Threat	Happy Outcome	Threat/ Happy Outcome
5- to 7-year-olds				
Male				
Intact Version	5	5	5	5
Interrupted Version	5	5	5	5
Combined	10	10	10	10
Female				
Intact Version	6	6	6	6
Interrupted Version	6	6	6	6
Combined	12	12	12	12
9- to 11-year-olds				
Male				
Intact Version	5	6	5	6
Interrupted Version	6	5	6	6
Combined	11	11	11	12
Female				
Intact Version	7	6	7	7
Interrupted Version	7	7	6	6
Combined	14	13	13	13

Note. Table values represent the number of subjects per cell.

familiarize the children with the experimenter and the physiological equipment. The experimenter explained that the equipment she had brought along could help tell how children feel while watching TV. She then described the purpose of both physiological instruments in simple language and, to reduce feelings of apprehension, encouraged the children to touch the sensors. Finally, the procedures were demonstrated with a volunteer while the class watched a short scene from a television program. On a nearby video monitor, children could see a graph depicting the volunteer's moment to moment bodily responses.

Experimental procedure. On the days of testing, each subject was brought individually to the testing room located within the school building. The subject was seated beside a low table approximately 10 feet from a television monitor and was asked to rest his or her left arm on the table. As the experimenter attached the physiological sensors to the fingers of the subject's left hand, she reminded the subject of the purpose of each of the measures. The subject was encouraged to keep the left arm very still while watching TV. When the subject seemed comfortable in the experimental situation, the experimenter started the videotape and the other experimental equipment. She then sat a few feet behind the subject, and attended to the television as much as possible. During the session, she used a remote control device to operate an unobtrusive video camera.

which was used to record the subject's facial expressions while viewing. Small video monitors linked to the physiological equipment and to the camera allowed the experimenter to continuously monitor the collection of physiological and facial data.

The videotape contained several programs in succession. The appropriate introduction preceded the experimental program on the videotape. Just before the introduction was to begin, the experimenter told the subject:

> Now you're going to hear a short introduction about the next program. I recorded the introduction myself, because I wanted you to know what the next program is about. Listen carefully so you can remember what is going to happen on the show.

To ensure that the subject attended to and comprehended the information in the introduction, the experimenter asked the subject to repeat what had been said about the events in the upcoming program. If the subject failed to repeat critical information, or made any errors in recall, the experimenter supplied the correct information. Specifically, when necessary, she reminded subjects that "Fritz is attacked by a big snake" and/or that "Ernest helps Fritz, and the boys are safe at home by the end of the show."

At the conclusion of the experimental segment (before or after the happy ending, depending on the condition), the experimenter stopped the videotape, detached the physiological measures, and asked the subject some questions about his or her responses to the show. Additional questions dealt with the subject's memory for the content of the introduction, personal preferences, and previous media exposure. If the subject had not yet seen the happy ending, this segment of the program was then shown, the subject's facial expressions were videotaped, and responses to the segment were assessed. The experimenter then asked the subject to join her at a nearby table, where supplementary measures of cognitive ability were administered. Before returning to class, each subject was permitted to choose a sticker, and was given a paper graph that depicted his or her physiological responses during the viewing session. The experimenter also asked each subject to promise not to discuss any aspect of the study with classmates until all children had had a chance to participate.

Materials and Equipment

The videotape viewed by subjects lasted 10 min 3 s. The content of the videotape is summarized in Appendix C. The first three segments on the tape were short sequences that had appeared on public television. The first sequence depicted nature in Wisconsin (47 s); the second sequence showed Wisconsin farmers cultivating the land and displaying their produce at a farmers' market (1 min 41 s); and the third sequence showed additional scenes of nature (50 s). These segments were intended to relax subjects and accustom them to the experimental setting.

The introduction to the experimental film was presented next. Subjects heard one of four introductions, which were designed to manipulate viewers' prior information about the program events (see Appendix A). Each introduction was preceded by a pause (black screen) that gave the experimenter time to instruct the subject to listen carefully to the upcoming message. The introductions are described more fully in Chapter Two. The Control message (16 s) contained introductory information but made no reference to the snake or the happy outcome. The Threat message (33 s) described the boys' encounter with the snake, but did not refer to the outcome of the attack. The Happy Outcome message (33 s) emphasized that the conclusion of the program would be happy, but did not specifically refer to any threat. The Threat/Happy Outcome message (50 s) included both a description of the encounter with the snake and an assurance of a happy ending.

The collection of physiological and facial data required that the experimental program begin at the same time on all four versions of the videotape. Since the introductions necessarily differed in length, the pause between the end of the last nature sequence and the beginning of the introduction varied according to condition. The pause preceding the introduction (rather than following it) was varied so that the length of time between the end of the introduction and the beginning of the experimental film was constant across conditions. The introduction was followed by a 40 s pause (blank screen) to allow time for the subject to repeat the message and receive any necessary corrections.

The final segment on the videotape was the edited sequence from *The Swiss Family Robinson*, which is described in greater detail in Chapter Two. During the segment, two teenage brothers, Fritz and Ernest, engage in a number of activities. The boys are shown playing in a waterfall with family members, leaving home in a boat, sailing through several bodies of water, and wading in a dark, swampy river. While wading in the river, Fritz is attacked by a large snake. He struggles with the snake, but appears unable to escape. Finally, during the happy outcome, Ernest rescues Fritz, and the boys return home safely to their parents. The Intact version of the film featured the entire program, uninterrupted (4 min 50 s). The Interrupted version had a short section of blank tape inserted just before Ernest rescues Fritz. Thus, in that version, the initial sequence (3 min 50 s) ends as Fritz appears to be succumbing to the snake's attack. The happy outcome is depicted in the concluding sequence (1 min). The blank tape enabled the experimenter to stop the videotape before the concluding sequence began.

The videotape was shown on a 19-in. Sony color monitor (model

CVM-1900), using a Panasonic VHS videocassette recorder (model PV-1720).

Subjects' facial expressions were recorded on a Panasonic portable videocassette recorder (model PV-A860), using a Panasonic color video camera (model WV-3240/12X) with a 10 to 120 mm zoom lens. The recordings were made on Scotch brand T-120 Color Plus professional videocassettes, in the SP (120 min) mode. The camera was mounted on a tripod next to the monitor that was used to present the experimental programs. A stereo microphone connected to the camera allowed the soundtrack of the videotape to be recorded along with the child's facial expressions. The camera featured a built-in digital stopwatch that recorded time in hundredths of seconds and could be superimposed on the videotape. The facial recordings were monitored by the experimenter on a 9-in. Ball Brothers Miratel black-and-white video monitor, which was placed out of the subject's view.

The physiological responses (heart rate and skin temperature) were measured with a Biolab 21 Computerized Physiological Monitoring System manufactured by the Cyborg Corporation (now owned by Autogenic Systems, Chicago, IL). The system is controlled by a built-in Apple II micro-computer.

To synchronize the facial and physiological recordings with the experimental sequence, two 5-second segments of color bars were presented at the beginning of the videotape, separated by 5 s of black screen. The offset of the first segment of color bars signalled the experimenter to start the digital clock on the video camera, and the offset of the second segment signalled her to start the Biolab computer. Both the digital clock and the computer ran continuously during the viewing session, although facial and physiological responses were recorded only during certain segments of the videotape.

Dependent Measures

Subjects' emotional reactions to the experimental segment were assessed using self-reports, physiological measures, and facial expressions. Additional questions were included to assess subjects' liking for and perceptions of the program content, and to evaluate the success of the manipulations. Measures were also obtained of subjects' affect toward snakes and toward scary media presentations, and their previous media exposure. Subjects who saw the intact version completed all of the self-report measures at the conclusion of the program; subjects who saw the interrupted version completed the self-report measures prior to viewing the happy ending, with the necessary exception that subjects reported on their responses to the happy ending after viewing it. The form used to obtain self-reports for the interrupted version of the program is presented in Appendix D. Finally, after the ending was shown and all self-report measures were completed, supplementary measures of various cognitive abilities were administered.

Self-reports of emotional response. Immediately following the experimental segment, subjects were asked to report on their emotional reactions to the film. Subjects were first asked how they felt "right now, just when the show ended." At this point, subjects who saw the Intact version reported on their reactions to the happy ending, and subjects who saw the Interrupted version reported on their reactions to the scene in which Fritz was attacked by the snake. Subjects' descriptions of how they felt were recorded verbatim. If the subject specifically reported feeling happy, sad, or scared (using either those terms or an obvious synonym such as glad, unhappy, or frightened), he or she was asked to indicate the intensity of the emotion. The experimenter presented a laminated board (14 x 52 cm) with the emotion label and a series of modifiers in progressively larger type: *a little bit, pretty, very, and very very.*[1] Above each choice was a schematic drawing of a child's face expressing the indicated level of the emotion (see Figures 1, 2, and 3).[2] The child was asked to point to the chosen response. If the subject did not spontaneously report feeling one of the above emotions, the experimenter produced a picture board (10 x 52 cm) that featured schematic drawings of happy, sad, scared, and neutral facial expressions (see Figure 4). As she pointed to the appropriate expression, she asked the subject if he or she felt happy, sad, scared, or just OK. A latin square was used to

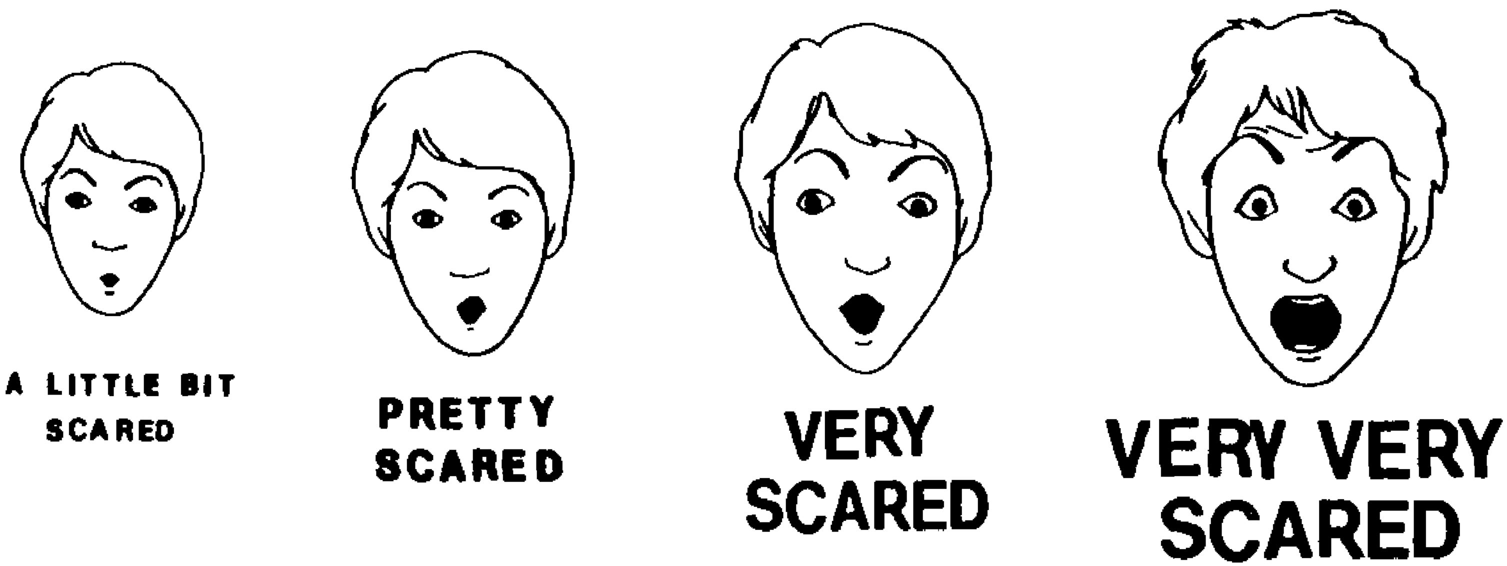

Figure 1. Rating scale for self reported degree of fear.

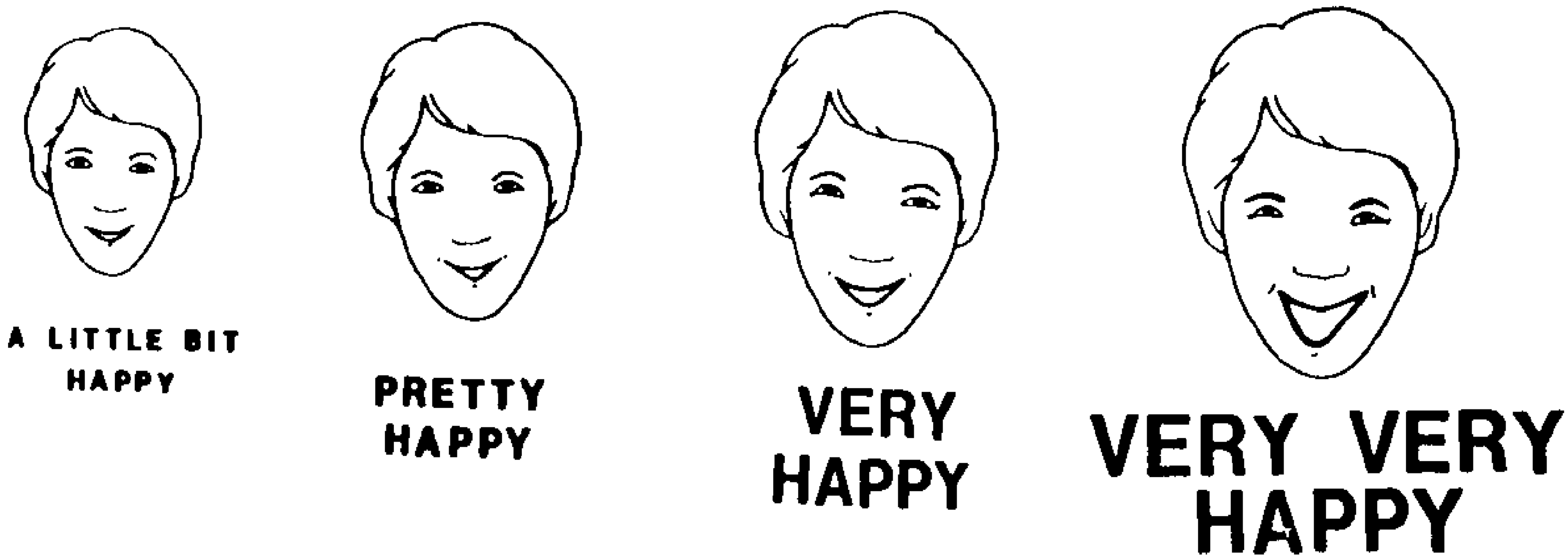

Figure 2. Rating scale for self reported degree of happiness.

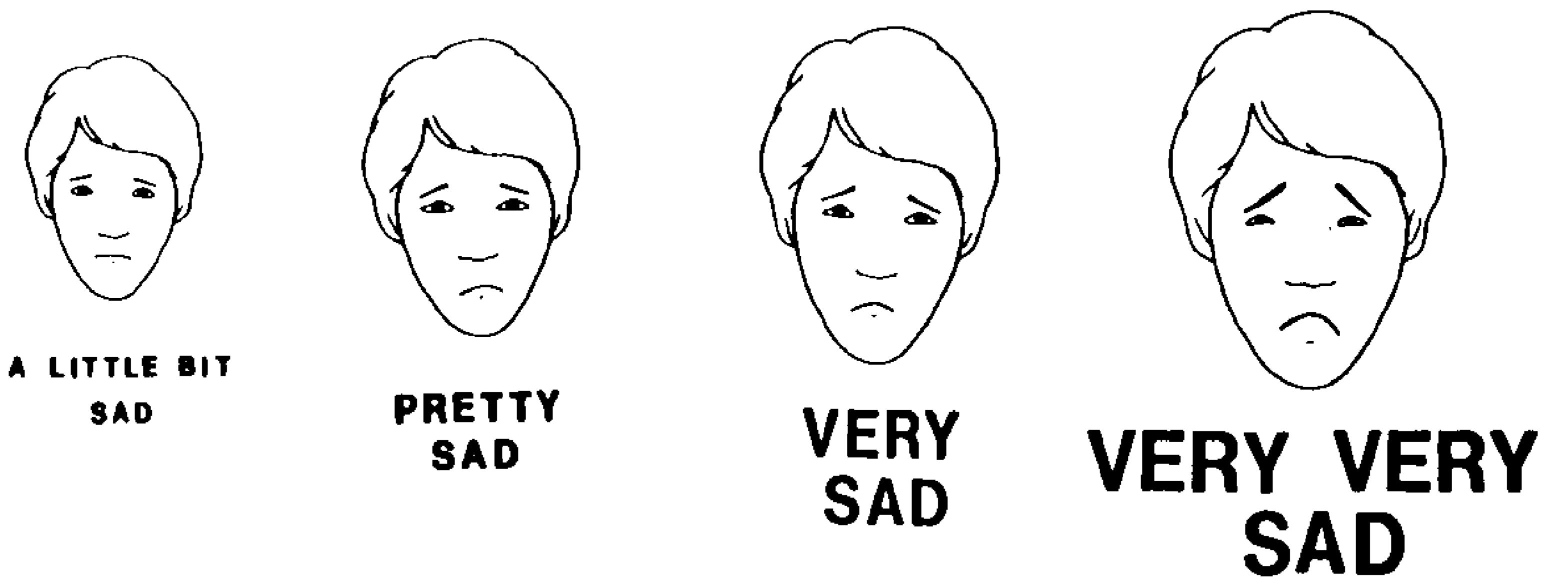

Figure 3 Rating scale for self-reported degree of sadness.

Figure 4. One of the picture boards used to present emotion labels.

construct three different orders for the first three emotion labels (happy, sad, scared; sad, scared, happy; and scared, happy, sad). The term "just OK" was always presented last. Separate picture boards were created for the three presentation orders, which were counterbalanced across subjects. If the subject reported feeling happy, sad, or scared, he or she was then asked to rate the intensity of the emotion, as described above.

After subjects reported on their responses to the final scene of the program, they were asked how they had felt during several other scenes: 1) when the boys were shown playing in the waterfall, 2) when the boys left on their trip, and 3) while the boys waded in the river, just prior to the appearance of the snake. Subjects who saw the Intact version were also asked how they had felt while watching Fritz struggle with the snake. Subjects who saw the Interrupted version reported on their response to the happy ending immediately after viewing it. While asking questions dealing with emotional responses to specific scenes, the experimenter displayed photographs depicting the indicated scene. For each scene, two 9 x 12 cm photographs were arranged vertically on a 14 x 20 cm piece of lightweight white cardboard and laminated. The pages were inserted into a looseleaf notebook to simplify their presentation.

Subjects were also asked how worried they had been about Fritz during the scene in which he was attacked by the snake: *not* *at all worried, a little bit worried, pretty worried, very worried*, or *very very worried*? These phrases were displayed, in increasingly larger type, on a laminated board (10 x 57 cm). Subjects who reported feeling worried about Fritz were asked to indicate the scene during which they first began to worry. Specifically, the experimenter showed the subject a 12 x 76 cm laminated board that featured a series of six 9 x 12 cm photographs, each taken from an important scene in the program. She pointed to the photographs in sequence as she said the following:

> These are pictures from the TV show, starting at the very beginning of the show. In this picture, Fritz and Ernest are playing in the waterfall. Here the boys are leaving in their boat. Here the boys are sailing on the ocean. Here the boys are first wading in the river. Here the snake comes up out of the water. And here Fritz is fighting the snake. Point to the picture that shows the scene where you first started to worry about Fritz.

As an indication of the degree of danger subjects perceived, they were also asked how dangerous they thought the snake was: *not at all dangerous, a little bit dangerous, pretty dangerous, very dangerous*, or *very very dangerous*. Again, the response alternatives were displayed, in progressively larger type, on a laminated board (10 x 57 cm).

Finally, subjects were asked to describe the strategies they used (if any) to reduce their fear or prevent themselves from becoming frightened as they watched the program. Responses were recorded verbatim.

Additional affective responses. Subjects' liking for various aspects of the program was also assessed. First, subjects were shown a photograph of Fritz, and were asked whether they liked or disliked him. Depending on the subject's response, the experimenter then asked "How much did you like(dislike) him? Did you like(dislike) him *a little bit, pretty much, very much,* or *very very much*?" The experimenter presented a laminated board (10 x 52 cm) with the appropriate response alternatives displayed in progressively larger type. Subjects' degree of like or dislike for "the way the program ended" and for "the program overall" was assessed using the same procedure.

Manipulation checks. The effectiveness of the introductory messages was assessed in several ways. Immediately after hearing the introduction, subjects were asked to repeat what the message had said would happen in the program. The experimenter recorded whether or not the subject spontaneously reported the critical information. If the subject had been told about the threat, some mention of the snake attack was required for "spontaneous recall." If the subject had heard about the happy outcome, some mention of the snake's defeat or the boys' safe return home was required. As noted above, the experimenter supplied any information that the subject failed to recall, and corrected any inaccurate statements.

During the post-viewing session, subjects were asked to recall what the introduction had said would happen in the show. Responses were recorded verbatim.

Finally, before viewing the happy ending, subjects who saw the Interrupted version were asked to predict what would happen next in the program. It was expected that subjects who had been told about the happy ending would be more likely than others to predict that Fritz's encounter with the snake would have a positive outcome. To maintain consistency across conditions, subjects who saw the Intact version were asked to recall how the program had ended. Responses were recorded verbatim. Finally, subjects were directly asked whether Fritz would/did escape safely.

Previous media exposure and personal preferences. Several additional questions assessed subjects' previous media exposure and their personal preferences that might be expected to influence their responses to the experimental program and to the provision of prior information. First, subjects were asked whether they had seen "the show about Fritz and Ernest before today." Subjects who reported having seen the program previously were asked if they could recall the title of the show. As a general indicator of subjects' media exposure, the permission slip included a space for parents to estimate the number of hours, "on the average," their child viewed television each day.

Subjects were also asked about their affective reactions toward snakes and toward scary programs. Following the procedure described earlier, subjects first stated whether they liked or disliked snakes, and then indicated the intensity of their response. Specifically, the experimenter presented the appropriate response board and asked "Do you like(dislike) snakes *a little bit*, *pretty much*, *very much*, or *very very much*?" The same procedure was used to assess the degree to which subjects liked or disliked scary television shows and movies. Frequency of exposure to scary media presentations was obtained by asking "How often do you watch scary TV shows or movies? Would you say you *never* watch them, *almost never* watch them, watch them *sometimes*, or watch them *a lot*?" The frequency terms were printed on a laminated board (10 x 52 cm) in increasingly larger type. The experimenter pointed to the words as she read the associated phrases.

Facial expressions. Subjects' facial expressions were videotaped during the entire edited segment of *The Swiss Family Robinson*. For subjects who saw the Interrupted version, the video recording was made in two parts. To provide a base level of facial behavior, expressions were also recorded during the nature segment that preceded the introduction.

Facial expressions were coded using the Affex facial coding scheme (Izard, Dougherty, & Hembree, 1983). Affex specifies the facial movements associated with ten emotion expressions: interest-excitement (IE), fear-terror (FT), sadness-dejection (SD), disgust-revulsion (DR), enjoyment-joy (EJ), surprise-astonishment (SA), distress-pain (DP), anger-rage (AR), shame-shyness (SS), and contempt-scorn (CS). Trained coders base their emotion judgments on appearance changes in three regions of the face (forehead/brows, eyes/nose/cheeks, and mouth/chin), and record the onset and offset of facial expressions in tenths of seconds. Thus, the Affex system produces data on both the frequency and the duration of emotional expressions. When more than one emotion is expressed simultaneously, Affex also permits the coding of blends. In most blends, the brow and eye regions of the face show one emotion, and the mouth region shows another. Although Affex was designed for use with infants and young children, the instructional materials contain verbal descriptions of how to modify the codes for use with older children.

Two coders achieved at least 80% reliability on Affex training materials. To practice coding the facial expressions of elementary school children, the coders also applied Affex to videotapes of 5- to 8-year-olds that had been obtained as part of an unrelated research project (Cantor & Hoffner, 1987). Their agreement on these practice materials also exceeded 80%.

For coding purposes, the videotapes in the present study were played on a Panasonic VHS videocassette recorder with search, slow motion, and freeze-frame functions, and were viewed on a 19-in. Sony color receiver/monitor. A digital stopwatch superimposed on the video records permitted coders to record the onset and offset of subjects' facial expressions to the nearest tenth of a second. The data for two subjects (a 6-year-old and a 7-year-old) were lost due to equipment failure. One coder coded the videotapes of all 184 subjects. For reliability, the second coder coded a randomly selected subset of 38 subjects (20.7%). Both coders were blind to subjects' condition, with the exception that coders were necessarily aware of whether subjects had seen the program intact or in two parts. Reliability was computed as the percentage of time (in tenths of seconds) that the reliability coder agreed with the codes given by the primary coder. Overall reliability was 96.3%. Reliabilities for the five most frequently observed emotions were as follows: enjoyment, 83.3%; surprise, 56.6%; fear, 72.8%; disgust, 97.0%; and sadness, 83.3%.

Physiological measures. Skin temperature and heart rate were recorded during the entire experimental segment (with the exception of the happy ending for the interrupted version). A 20-second base level was obtained during a nonarousing videotape segment that depicted scenes of nature. A software program designed for the Biolab computer sampled both measures every second and recorded each 2-second average.

Although some specific physiological differences have been found between emotions, such as between anger and fear (Ax, 1957; Ekman, Levenson, & Friesen, 1983; Schwartz, Weinberger, & Singer, 1981; Weerts & Roberts, 1976), there still seems to be no single response or pattern of responses that can reliably indicate the experience of a particular emotion. However, physiological changes may be used to corroborate more specific indicators of emotional state such as self-report or facial expression.

The first measure, skin temperature, decreases as an individual becomes more aroused. The temperature of the skin varies according to the amount of blood flowing near the surface of the skin. Blood flow, in turn, depends on the dilation or constriction of blood vessels under the control of the sympathetic nervous system. Increased sympathetic arousal produces vasoconstriction, which lowers skin temperature, while decreased sympathetic arousal produces vasodilation, which raises skin temperature (Plutchik, 1956).

Several studies have reported drops in skin temperature during aversive emotional states (Mittelman & Wolff, 1943; Schachter, 1957; Wilson & Cantor, 1985). Skin temperature responds more slowly than other physiological measures, such as heart rate, and therefore reflects changes in general state, rather than immediate reactions to stimuli. The fingers and toes are the preferred measurement sites for experimental investigation because they are most sensitive to changes in skin temperature (Plutchik, 1956).

The Biolab M-120 thermal module was used to record finger temperature in degrees centigrade (with resolution to .01 degrees). A small temperature probe (thermistor) was taped to the distal pad of the subject's left pinky finger. The M-120 module tracks skin temperature continuously within a range of approximately 15 to 38 degrees centigrade.

Heart rate, the second physiological measure, is affected by a variety of internal and external factors. Generally, heart rate has been found to increase in response to anxiety- or fear-producing stimuli (Ax, 1957; Hare, 1973; Hare & Blevings, 1975; Klorman, Wiesenfeld, & Austin, 1975; Lazarus, Speisman, Mordkoff, & Davidson, 1962; Schwartz, Campos, & Baisel, 1973). The cardiovascular system is innervated by both the sympathetic and the parasympathetic branches of the autonomic nervous system. Sympathetic arousal accompanies aversive emotional reactions and tends to elevate heart rate. According to Lacey (e.g., Lacey, Kagan, Lacey, & Moss, 1963), heart rate acceleration indicates rejection of external information, as in a defensive reaction to a fear stimulus. There is, however, some controversy over whether changes in heart rate reliably reflect changes in affective state

(Elliot, 1974; Obrist, Light, & Hastrup, 1982). Nonetheless, heart rate was assessed in the present study because this measure has been used successfully in previous research as an indicator of fear or anxiety.

Heart rate was measured in beats-per-minute by the Biolab M-180 heart rate module using a photoplethysmographic technique. The photoelectric device operates in the following way. A light source placed flush against the skin shines into the tissue, and a photocell records the reflected light. Pulse volume, or the amount of blood in the capillaries near the surface of the skin, regulates the amount of reflected light. Momentary changes in pulse volume represent the pumping action of the heart, and are used to calculate beats-per-minute. The sensor was attached to the distal pad of the subject's left ring finger by a velcro band.

Supplementary measures of cognitive abilities. Several additional measures were taken, in an effort to identify the cognitive skills that underlie the ability to utilize different types of prior information.

In order to use knowledge of a happy ending to modify emotional responses to an ongoing media presentation, a child must maintain the prior knowledge in memory while simultaneously processing the program. Measures of working memory capacity should be related to the child's ability to do this successfully. Of course, it is not possible to devise a test that is content-free (Case, 1985). Since the prior information is presented verbally in the present study, a verbal measure seemed most appropriate. However, the use of "happy outcome" information while processing an audiovisual narrative also may be related to the ability to mentally manipulate visual-spatial information, since visualizing the outcome may aid in applying it to a presentation.

In addition, prior knowledge of a happy outcome can reduce fear or worry only if children understand that the outcome described before the show actually follows the threatening scene. Thus, understanding sequences of events should also be an important factor in the effect of prior knowledge about a happy outcome.

It is less clear which specific cognitive abilities are involved in anticipating an event, in this case a threat. It does seem likely that attention to detail, and sensitivity to sequential relations should make children more likely to pick up on narrative cues suggesting that the threat may occur.

Two tests were selected as measures of working memory capacity: The Opposites test and the Mr. Cucumber test (Case, 1985; personal communication, November 10, 1987). One test was selected as a measure of sequencing ability: the Picture Arrangement test from the Wechsler Intelligence Scale for Children, revised version (WISC-R).

According to Case (1985), a valid test of working memory capacity requires subjects to perform a series of similar cognitive operations, and to store a "pointer" to each operation while the next is being performed. Short term storage space (STSS) is measured by the number of successive operations a subject can successfully perform while storing the results of previous operations. Successful completion of the majority of items at a given level of difficulty can be taken as an indication that the child is able to successfully execute and store that number of operations. Both the Opposites test and the Mr. Cucumber test provide information of this type. Case does not have reliability data for the tests, but he has correlated the tests with performance on other measures of memory capacity (Case, 1985; personal communication, November 10, 1987).

The Opposites test (Case, personal communication, November 10, 1987; McKeough, 1987) is a verbal measure of STSS that was devised by Robbie Case and has been used in research by him and his students. Before administering the test, the experimenter familiarizes the child with the eight pairs of opposites used in the test. The experimenter introduces each pair by stating the relationship between the two words (e.g., "Hot is the opposite of cold"), and then asks the child to repeat the information (e.g., "What is the opposite of cold?"). Following this warmup, the test is administered. At level one, the experimenter says one word at a time (e.g., hard), and the child responds by stating the opposite of the word (e.g., soft). The test includes five levels of difficulty, ranging from 1 to 5 words in a series. For series of two or more words, the child is required to listen to the list, and then to state the opposites of the words, in the order in which they were presented. There are five trials at each level, and the test proceeds until the child gets all trials at a level incorrect (i.e., makes at least one error on each trial). The test requires that the child store the words in memory and simultaneously generate the antonym of each. The longer the list of words the child can deal with successfully, the larger his or her STSS is assumed to be.

The CUCUI, or Mr. Cucumber test (Case, 1985), is another measure of working memory. The test is reportedly highly motivating and well-liked by children. The general procedure involves showing children a drawing of a clown-like figure ("Mr. Cucumber") with brightly colored stickers affixed to various body parts (see Case, 1985). The picture is then removed, and children are shown a copy of the drawing with no stickers. They are asked to point to the body parts that were colored in the previous picture. To reduce iconic memory for the location of the stickers, children look at a grid for 2 seconds before being shown the uncolored drawing. The test is composed of a series of pictures of the clown with an increasing number of colored parts.

The number of body parts children are able to remember at one time is considered to be an indicator of their working memory capacity. There are six levels of difficulty (ranging from 1 to 6 stickers), with three trials at each level. As with the Opposites test, the test begins with the first level and proceeds until the child gets all trials at a level incorrect. The Mr. Cucumber test is a nonverbal measure of STSS which differs from the Opposites test both in the modality of the content (visual rather than verbal) and in the organization of the information (spatial rather than sequential).

The Picture Arrangement test is a subset of the Wechsler Intelligence Scale for Children-Revised (WISC-R), an individually administered intelligence test (Wechsler, 1974). The test involves 13 sets of pictures. Each set consists of from 3 to 5 pictures that depict a sequence of logically-related and temporally-ordered events. For example, in one picture set, a burglar raises a window, climbs into a building, steals some money, and is caught as he attempts to leave. Each set is presented to the child in a scrambled order, and the child is asked to put the pictures in the correct order. The sequences increase in difficulty, and the test is stopped after the child fails three times in a row to produce the correct order. After the first four picture sets, the child is asked to work as quickly as possible and his or her performance is timed.

The Picture Arrangement test measures sequencing ability, in addition to other skills that may be relevant to children's utilization of prior information about a television narrative: common sense, understanding of cause/effect relationships, the ability to distinguish essential from nonessential detail, the ability to comprehend a total situation, nonverbal reasoning, and social judgment (Cooper, 1982; Kaufman, 1979). These individual skills may all be involved in children's application of schemas for understanding sequences of actions (cf. Anderson & Pearson, 1984). Thus, it is apparent that successful performance on the Picture Arrangement test requires the coordination of many different abilities. However, it seems that the test should still provide a general index of the ability to understand sequential relations. This test does not require mental manipulation of information, since the pictures are physically in front of the child while he or she attempts to sequence them.

CHAPTER SIX

Results

For the sake of simplicity, forewarning of the threat will be referred to as the Threat factor, prior knowledge of the happy outcome will be referred to as the Happy Outcome factor, and timing of exposure to the ending will be referred to as the Ending factor.

Manipulation Checks

Two measures provided information about the effectiveness of the manipulation of prior information. First, immediately following the introduction, the experimenter noted each subject's ability to recall the gist of the prior information that had been presented. The accuracy of each subject's response was judged "on the spot," because the experimenter then corrected any errors or omissions she noted. The effectiveness of the manipulations was assessed a second time, near the end of the testing session, by asking subjects to recall what program events they had heard about beforehand. Responses were recorded verbatim.

For initial recall, separate analyses examined memory for the threat forewarning and memory for the happy outcome information: each was examined as a function of age level and whether the information was presented alone or in combination with the other type of information (in the Threat/Happy Outcome condition).

Specifically, for each type of introductory information (threat forewarning, happy outcome information), a three-way contingency table was constructed, using the variables Age Level, Condition (one vs. both types of information), and Recall Accuracy, and a loglinear analysis was conducted on the frequencies. When at least one of the variables in a contingency table is a response variable, this method parallels the traditional analysis of variance (Marascuilo & Levin, 1983).[3] The analyses revealed no effects associated with condition. In other words, subjects' recall was unaffected by whether the information was heard alone or was combined with the other type of information. Overall, older subjects were more accurate than younger subjects in recalling the introductory information about both the threat, $\underline{G}^2$ (1) = 7.72, p < .01, and the happy outcome $\underline{G}^2$ (1) = 12.23, p < .001. The threat information was correctly recalled by 68.1% of younger subjects and 100.0% of older subjects, and the happy outcome information was correctly recalled by 61.4% of younger subjects and 91.9% of older subjects. Across both age levels, there seems to be a slight tendency for the threat information to be recalled more accurately than the information about the happy outcome. It should be noted that this measure assesses initial recall of the content of the recorded introduction. Any errors or omissions were corrected by the experimenter.

The second measure of recall for the introduction was obtained after the conclusion of the program. Responses were classified into five categories: (1) mention of general activities only (e.g., "two boys were going to do things together on an island"); (2) reference to the attack only (e.g., a snake would come out of the water and grab Fritz"); (3) reference to the happy outcome only (e.g., "Ernest would help Fritz and they'd live happily ever after with their parents"); (4) reference to both the attack and the happy outcome (e.g., "there'd be a dangerous snake, but they'd come home OK"); and (5) reference to both an indirect threat and the happy outcome, without specific mention of the attack (e.g., "they were going to get in trouble, but they'd survive and come back to their family"). This latter category was included because the pretest had indicated that the Happy Outcome introduction indirectly implied a threat. Two independent coders agreed on 95.7% of the classifications. Disagreements were resolved by a third coder.

The distribution of responses for younger and older children are reported in Table 3. A visual inspection of the data indicates that nearly all subjects, at both age levels, accurately recalled the content of the Control introduction (95.7%, combined across age groups), the Threat introduction (100.0%), and the Threat/Happy Outcome introduction (95.7%). Subjects who heard the Happy Outcome introduction were also quite accurate in recalling that they had been told about the happy ending (84.8%). However,

Table 3

Recall of the Introduction, Assessed After the Program, as a Function of Age Level

5- to 7-year-olds

Recall Content	Control	Threat	Happy Outcome	Threat/ Happy Outcome
	Condition			
Activities only	20	-	4	-
Attack only	1	22	-	2
Happy Outcome only	-	-	13	-
Attack + Happy Outcome	-	-	-	20
Danger + Happy Outcome	-	-	2	-
No Response	1	-	3	-

9- to 11-year-olds

Recall Content	Control	Threat	Happy Outcome	Threat/ Happy Outcome
	Condition			
Activities	25	-	-	-
Attack only	-	24	-	-
Happy Outcome only	-	-	15	-
Attack + Happy Outcome	-	-	-	25
Danger + Happy Outcome	-	-	9	-
No Response	-	-	-	-

Note. Table values reflect the number of subjects in each condition whose recall included the indicated information. To improve readability, zeroes are replaced with dashes.

approximately one quarter of the subjects who correctly mentioned the happy outcome (28.2%) also reported having heard about an indirect threat. Consistent with the findings for adults, older children who heard the Happy Outcome introduction were more likely to infer danger (37.5%) than were younger children in this condition (9.1%).

Overall, the second manipulation check indicates that the communication of prior information was relatively successful, with the exception that information about the happy outcome tended to imply a threat. The pretest had indicated that this latter effect might emerge. The fact that a few subjects were unable to accurately recall the events described in the introduction does not necessarily indicate that these subjects were unaffected by the prior information. Even if subjects understood and remembered the prior information when it was presented, once they viewed the program, they may have found it difficult to distinguish between events that they had vs. had not heard about beforehand (cf. Foley & Johnson, 1985; Lehman, Mikesell, & Doherty, 1985). Finally, the two manipulation checks revealed a striking difference between younger subjects' initial recall (immediately following the audiotaped introduction) and their delayed recall (following the experimenter's corrections). This difference suggests that the younger subjects had difficulty grasping the information when it was initially presented on audiotape. It may be that the audiotaped presentation did not effectively elicit or maintain younger children's attention. In any case, these data demonstrate that an immediate manipulation check and the provision of corrective information can help overcome the difficulties involved in communicating verbal information to young children.

Previous Exposure to the Experimental Program

Forty-seven subjects (25.3%) reported that they had previously seen the experimental program. As can be seen in Table 4, these subjects were distributed approximately equally across the two age levels and across the four conditions. A loglinear analysis of these data revealed no significant effects (all p values > .40). Only 18 subjects (9.7%) were able to identify the title of the movie as *The Swiss Family Robinson*.

Although one quarter of the subjects reported previous exposure to the program, it was considered unlikely that the presence of these subjects in the sample could account for the observed effects. There are several reasons for this conclusion. First, as already noted, subjects who reported having seen the program previously were distributed approximately equally across conditions. Furthermore, the fact that slightly more subjects in the control condition than in the other conditions had seen the show should actually have worked against the hypotheses. Specifically, a higher incidence of previous exposure in the control condition would serve to "dilute" the effects of prior

Table 4

Percentage of Subjects at Each Age Level Who Stated That They Had Previously Seen the Experimental Film

Age (in years)	Condition			
	Control	Threat	Happy Outcome	Threat/ Happy Outcome
5-7	27.3	13.6	22.7	27.3
N	(22)	(22)	(22)	(22)
9-11	40.0	25.0	20.8	24.0
N	(25)	(24)	(24)	(25)
Combined	34.0	19.6	21.7	25.5
N	(47)	(46)	(46)	(47)

Note. Loglinear analysis of these data revealed no significant effects.

It seemed possible, however, that effects of the manipulations might be obscured by the inclusion of previously exposed subjects in all conditions. Therefore, after the initial analyses were completed, the analyses of self-reported emotions, facial expressions, physiological responses, coping strategies, and predictions were rerun, excluding subjects who reported previous exposure to the program. No new effects of the manipulations reached significance in these analyses, but some effects were reduced. The pattern of results, however, generally remained the same. Thus, the changes in significance were most likely due to the loss of power that resulted from the elimination of one-fourth of the subjects. For each major section of results (self-reported emotions, facial expressions, physiological responses, coping strategies, and predictions), any differences between the original analyses and the reanalyses are presented in a footnote at the end of the section.

Self-Reports of Emotional Response

Subjects reported on their feelings in response to five scenes from the program. The initial scene (the boys playing in a waterfall) was included primarily to introduce the characters and to elicit interest in the program. Responses to this scene were obtained primarily to confirm that the scene was enjoyable and did not elicit fear. For the scene that depicted the snake attack, and for the two preceding scenes (the boys sailing on the ocean, and wading through a river), the experimental hypotheses dealt primarily with children's fear reactions. The final scene of the program provided a happy resolution of the dangerous situation depicted in the preceding sequence. For this scene, children's feelings of happiness or positive affect were of primary interest.

Based on the above expectations, reports of positive emotions (open-ended reports and ratings of happiness) were examined for the waterfall scene and the homecoming scene, and reports of fear (open-ended reports and ratings of fear) were examined for the sailing, wading, and snake scenes. The majority of subjects reported feeling the target emotion for each scene, with the exception that the sailing scene elicited few emotional responses of any type. Worry about the threatened character was also assessed. Children reported how much they worried about Fritz as he fought the snake, and at what time during the program they initially began to worry about him.

Subjects' open-ended reports of emotion were coded for reference to (a) positive feelings of happiness or enjoyment, and (b) fear or anxiety. Examples of positive feelings include "happy," "glad," and "good." Examples of fear-related feelings include "scared," "worried," and "nervous." Other responses were coded as indicating neither positive feelings nor fear. Two independent coders agreed on 98.9% of the responses. Disagreements were resolved by a third coder.

Children's ratings of how happy they felt during the waterfall scene and the homecoming scene were given the following codes: *a little bit happy* (1); *pretty happy* (2); *very happy* (3); and *very very happy* (4). Subjects who reported feeling another emotion (sad or scared) or no emotion at all (just OK) were given the code of (0), *not at all happy*. Children's ratings of how scared they felt during the sailing, wading, and snake scenes were given the following codes: *a little bit scared* (1); *pretty scared* (2); *very scared* (3); and *very very scared* (4). Children who reported feeling another emotion (happy or sad) or no emotion at all (just OK) were given the code of (0), *not at all scared*.

Independent variables for self-reports of emotion were Threat, Happy Outcome, Age Level, Sex, and, for responses to the homecoming scene, Timing of the Ending.[4] In some analyses, sex was excluded due to small cell sizes. For categorical data, loglinear analyses were conducted on the frequencies of responses. Post hoc comparisons were calculated using the chi-square analog to the Scheffe method (Marascuilo & Levin, 1983). Intensity ratings were analyzed using unweighted-means analyses of variance (ANOVA). Post hoc comparisons were calculated using the Scheffe method. Percentages or means in the text that have no letter in their subscripts in common differ at $p < .05$ by the appropriate test.

Open-ended reports of positive affect during the waterfall *scene*. The majority of subjects (79.6%) spontaneously reported feelings of happiness or enjoyment in response to the waterfall scene. Reports of fear were very low (3.2%), and children's spontaneous comments indicated that those who reported fear were concerned that the boys would hurt themselves as they slid down the waterfall. The few reports of fear during this scene were unrelated to prior information.

A five-way multidimensional table was constructed, using the variables Threat, Happy Outcome, Age Level, Sex, and Positive Affect (present, absent). A loglinear analysis of the frequencies revealed no significant effects.

Degree of happiness during the waterfall scene. Children's ratings of how happy they felt during the waterfall scene were analyzed in a 2 x 2 x 2 x 2 unweighted-means analysis of variance, with Threat, Happy Outcome, Age Level, and Sex as factors. The analysis revealed only one significant effect: a Sex x Threat x Happy Outcome interaction, $\underline{F}$ (1,170) = 7.39, p < .01. Among girls, there were no significant differences across conditions (control, $\underline{M} = 1.9_{ab}$; threat, $\underline{M} = 2.1_{ab}$; happy outcome, $\underline{M} = 2.2_{ab}$; threat/happy outcome, $\underline{M} = 1.9_{ab}$). Among boys, however, subjects reported more happiness in the Control condition ($\underline{M} = 2.6_{b}$) than in either the Threat condition ($\underline{M} = 1.5_{a}$) or the Happy Outcome condition ($\underline{M} = 1.6_{a}$); happiness in the Threat/Happy Outcome condition held an intermediate position ($\underline{M} = 2.4_{ab}$). This pattern of means does not seem to be interpretable.

Open-ended reports of fear during the sailing, wading, and snake scenes. Fear was reported infrequently during the scene in which the boys sailed on the ocean (15.0%). For the wading and snake scenes, more than half of the subjects reported feeling fearful: 51.6% during the wading scene, and 53.2% during the snake attack. For all three scenes, five-way multidimensional contingency tables were constructed, using the variables Threat, Happy Outcome, Age Level, Sex, and Fear (present, absent). Loglinear analyses were conducted on the cell frequencies.

There were no significant effects associated with reports of fear during the sailing scene. For the wading scene, there was a main effect of forewarning about the threat, $\underline{G}^2$ (1) = 5.22, $p < .03$. Subjects who had been forewarned were more likely to report feeling fearful as the boys waded through the river (60.2%) than were subjects who had not been forewarned (43.0%). No other effects reached significance.

For the scene involving the snake attack, there was an interaction between prior knowledge of the happy outcome and age level, $\underline{G}^2$ (1) = 4.63, $p < .04$. Although none of the subsequent comparisons were significant, knowledge of the happy outcome tended to reduce fear responses among older subjects (prior knowledge, 44.9%; no prior knowledge, 63.3%), but tended to increase fear responses among younger children (prior knowledge, 59.1%; no prior knowledge, 45.5%). The only other significant effect was a main effect of sex, $\underline{G}^2$ (1) = 5.55, p < .02, with fear reported more frequently by girls (61.4%) than by boys (43.5%).

Degree of fear during the sailing, wading, and snake scenes. Children's ratings of how scared they felt during the sailing, wading, and snake scenes were analyzed in a 2 x 2 x 2 x 2 unweighted-means analysis of variance, with Threat, Happy Outcome, Age Level, and Sex as factors.

For the sailing scene, no significant effects emerged. For the wading scene, the expected main effect of happy outcome approached significance, $\underline{F}$ (1,170) = 3.15, p < .08. Subjects tended to report less fear if they had been told about the happy outcome ($\underline{M}$ = 0.9) than if they had not been told ($\underline{M}$ = 1.3). The main effect of age level also approached significance, $\underline{F}$ (1,170) = 2.91, p = .09. Younger subjects tended to report a higher degree of fear ($\underline{M}$ = 1.3) than did older subjects ($\underline{M}$ = 0.9). The only effect that reached significance in this analysis was the four-way interaction among threat, happy outcome, age level, and sex, $\underline{F}$ (1,170) = 4.77, p < .04. The means are presented in Table 5. For subjects who were not forewarned about the threat, prior knowledge of the happy outcome reduced fear among younger boys, and tended to do so among older subjects of both sexes. For subjects who had been forewarned about the threat, information about the happy outcome had no consistent effect on fear.

Table 5

Mean Degree of Fear Reported During the Wading Scene, as a Function of Prior Information, Age Level, and Sex of Subject

5- to 7-year-olds

	Threat Forewarning			
	No		Yes	
Happy Outcome Information	Male	Female	Male	Female
No	1.7_{b}	1.1_{ab}	1.1_{ab}	1.8_{b}
Yes	0.6_{a}	1.4_{ab}	1.6_{ab}	0.8_{ab}

9- to 11-year-olds

	Threat Forewarning			
	No		Yes	
Happy Outcome Information	Male	Female	Male	Female
No	1.0_{ab}	1.6_{ab}	0.5_{a}	1.2_{ab}
Yes	0.5_{a}	0.6_{a}	0.8_{ab}	1.2_{ab}

Note. Means with no letter in common in their subscripts differ at $p < .05$ by the Scheffe method.

information provided in the other three conditions. Second, the scenes from *The Swiss Family Robinson* were not presented in the sequence in which they occurred in the original film. Thus, it should have been difficult for subjects to accurately anticipate events. Third, the experimenter observed that many subjects who said that they had seen the film before showed no signs of recognition until near the end of the edited sequence (during the snake scene), or reported having seen the show only after reflecting on the question. Finally, it seemed likely that the introduction describing the threat and/or the happy outcome would have contributed much more than previous exposure toward making these events salient to subjects. In other words, although previous exposure undoubtedly produced some degree of familiarity with the depicted events, the provision of specific, detailed information about the threat and/or the happy outcome immediately prior to the program should have greatly enhanced the likelihood that subjects would think of these events while viewing (cf. Cantor et al., 1988).

The analysis of fear ratings for the snake scene revealed a main effect of sex, $\underline{F}$ (1,170) = 5.40, p < .03, and an interaction between sex and happy outcome, $\underline{F}$ (1,170) = 4.51, p < .04. Overall, girls reported more fear ($\underline{M}$ = 1.8) than did boys ($\underline{M}$ = 1.3). In addition, the interaction indicated that prior knowledge of the happy outcome significantly reduced girls' degree of fear (no prior knowledge, $\underline{M} = 2.1_b$; prior knowledge, $\underline{M} = 1.5_a$) but did not reduce fear among boys (no prior knowledge, $\underline{M} = 1.1_a$; prior knowledge, $\underline{M} = 1.4_a$). No other effects reached significance. Prior knowledge seems to have brought fear among girls down to the boys' level.

To determine whether forewarning of the threat or prior knowledge of the happy outcome exerted any overall effect on fear across the three scenes, ratings of fear during the sailing, wading, and snake scenes were also subjected to a repeated measures analysis of variance. Because the sphericity assumption was violated, effects associated with the repeated factor were evaluated using the Geisser-Greenhouse correction.[5] The analysis revealed a main effect of age level that approached significance, $\underline{F}$ (1,170) = 3.05, $p < .09$, with higher fear among younger subjects ($\underline{M} = 1.1$) than among older subjects ($\underline{M} = 0.8$). The analysis also revealed a main effect of scene and an interaction between scene and sex. Table 6 shows that, overall, fear increased significantly across the three scenes. The interaction with sex arises from the fact that boys and girls did not differ in their degree of fear during the sailing or wading scenes, but girls reported higher fear during the snake scene than did boys. The only effect associated with the manipulations was a significant five-way interaction among all variables, $\underline{F}$ (2,340) = 3.47,

Table 6

Mean Degree of Fear During the Sailing, Wading, and Snake Scenes as a Function of Sex of Subject

Scene	Male	Female	Combined
Sailing	0.3_a	0.2_a	0.3_A
Wading	1.0_b	1.2_b	1.1_B
Snake	1.3_b	1.8_c	1.5_C

Note. Means in the same row or column with different lowercase subscripts differ at $p < .05$ by the Scheffe method. Means with different uppercase subscripts differ at $p < .05$ by Scheffe.

$p < .04$. The pattern of the means, however, does not seem to be interpretable.

Worry about the threatened character. Fully 85.5% of the subjects reported worrying to some degree about Fritz as he fought the snake. Subjects' reports of how worried they felt were coded as follows: *not at all worried* (0); *a little bit worried* (1); *pretty worried* (2); *very worried* (3); and *very very worried* (4). These data were also analyzed in a 2 x 2 x 2 x 2 ANOVA, with Threat, Happy Outcome, Age Level, and Sex as factors. This analysis produced only a main effect of age level, $\underline{F}$ (1,170) = 16.94, $p < .001$, with more worry among younger subjects ($\underline{M}$ = 2.5) than among older subjects ($\underline{M}$ = 1.7).

Subjects who reported feeling at least a little bit worried ($\underline{N}$ = 159) were asked to identify the scene during which they first began to worry about Fritz. The response board presented photographs of six scenes: (1) the boys playing in the waterfall; (2) the boys leaving on a boat; (3) the boys sailing on the ocean; (4) the boys wading in the river; (5) the snake emerging from the river; and (6) the snake attacking Fritz. Only six subjects indicated that they began to worry before the boys were shown wading in the river. Thus, the first four categories were collapsed, and the scenes associated with onset of worry were classified as follows: (1) before the snake appeared; (2) after the snake appeared, but before the attack; and (3) during the attack. A five-way contingency table was constructed, using the variables Threat, Happy Outcome, Age Level, Sex, and Scene, and the data were analyzed using the loglinear method. The analysis revealed both a main effect of threat, $\underline{G}^2$ (2) = 6.41, p = .04, and a main effect of age level, $\underline{G}^2$ (2) = 24.52, p < .001. As Table 7 shows, subjects who were forewarned about the upcoming threat began to worry earlier in the program than did subjects who were not forewarned. Table 7 also shows that, overall, older subjects began to worry about Fritz earlier in the show than did younger subjects.

Open-ended reports of positive affect during the homecoming scene. Subjects viewed the happy ending either immediately after the snake scene or after they reported on their other responses. Fully 85.5% of the subjects spontaneously reported positive feelings in response to this sequence. A five-way multidimensional table was constructed, using the variables Threat, Happy Outcome, Age Level, Ending, and Positive Affect (present, absent). The variable of sex was excluded due to low cell frequencies. A loglinear analysis of the data revealed a main effect of age level, $\underline{G}^2$ (1) = 4.57, p < .04, with positive emotions reported more often by younger subjects (92.0%) than by older subjects (79.6%). In addition, there was an interaction between forewarning of the threat and age level, $\underline{G}^2$ (1) = 5.97, p < .02. Among younger subjects, those who had been forewarned were

Table 7

Percentage of Subjects Who Began to Worry During Each Sequence, as a Function of Threat Forewarning, and as a Function of Age Level

Threat Forewarning	When Worry Began: Before snake appeared	When snake first appeared	During Attack	N
No	32.5	43.7	23.8	80
Yes	50.6	39.3	10.1	79

Age (in years)	When Worry Began: Before snake appeared	When snake first appeared	During Attack	N
5-7	29.6	39.0	32.4	77
9-11	53.7	43.9	3.4	82

Note. Subjects who reported that they never worried about the threatened characters (n = 27) were excluded from the analysis. Percentages with no letter in their subscripts in common differ at $p < .05$ by the Scheffe method.

less likely to report positive feelings (84.1%) than were subjects who had not been forewarned (100.0%). Among older subjects, forewarning of the threat did not significantly affect reports of positive affect (forewarning, 83.7%; no forewarning, 75.5%).

Degree of happiness during the homecoming scene. Forced-choice reports of emotion indicated that most subjects (82.3%) experienced happiness during the homecoming scene. No subjects reported feeling sad or scared. Children's ratings of how happy they felt during this scene were analyzed in a 2 x 2 x 2 x 2 x 2 unweighted means analysis of variance, with Threat, Happy Outcome, Age Level, Sex, and Ending as factors. The analysis revealed a main effect of threat, $\underline{F}$ (1,154) = 5.22, $p < .03$, with subjects who had been forewarned reporting less happiness ($\underline{M}$ = 2.0) than subjects who had not been forewarned ($\underline{M}$ = 2.5). There were also main effects of age level, $\underline{F}$ (1,154) = 12.56, $p = .001$, and timing of the ending, $\underline{F}$ (1,154) = 7.14, $p < .01$. Younger subjects reported feeling happier ($\underline{M}$ = 2.6) than did older subjects ($\underline{M}$ = 1.9), and subjects who had seen the ending after a delay (interrupted version) reported feeling happier ($\underline{M}$ = 2.5) than did those who saw the entire program without interruption (intact version, $\underline{M}$ = 2.0).

The interaction among threat forewarning, timing of the ending, and sex was also significant, $\underline{F}$ (1,154) = 4.01, $p < .05$.

The means associated with this effect are reported in Table 8. As can be seen from the table, forewarning of the threat significantly reduced happiness only among girls who saw the intact version of the program. Forewarning also tended to reduce happiness among boys who saw the ending after a delay. Finally, there was an interaction among happy outcome, timing of the ending, and sex, $\underline{F}$ (1,154) = 5.53, p = .02. As can be seen in Table 9, boys who received no prior information about the happy outcome and who saw the ending after a delay reported significantly less happiness than subjects in all other groups.[6]

Summary of analyses of self-reports of emotion. Forewarning of the threat significantly increased subjects' open-ended reports of fear during the wading scene, but did not influence the degree of fear they reported experiencing. No effects of forewarning were observed on fear responses during the snake scene. Forewarning of the threat also led subjects to begin worrying about the threatened character earlier in the program. Taken together, these data suggest that forewarning enhanced anticipatory fear, but did not intensify fear responses during the frightening scene.

Responses to the homecoming scene were affected by forewarning of the threat as well. Forewarning reduced open-ended reports of positive affect among younger subjects, but not among older subjects. Forewarning also reduced self-reported degree of

Table 8

Mean Degree of Happiness During the Homecoming Scene as a Function of Threat Forewarning, Timing of the Ending, and Sex of Subject

	Program Version			
	Intact		Interrupted	
Threat Forewarning	Male	Female	Male	Female
No	1.9_a	2.8_b	2.8_b	2.5_{ab}
Yes	1.6_a	1.8_a	2.1_{ab}	2.7_b

Note. The entire program was viewed without interruption in the intact version; the ending was seen after a delay in the interrupted version. Means with no letter in their subscripts in common differ at $p < .05$ by the Scheffe method.

Table 9

Mean degree of Happiness During the Homecoming Scene as a Function of Happy Outcome Information, Timing of the Ending, and Sex of Subject

	Program Version			
	Intact		Interrupted	
Happy Outcome Information	Male	Female	Male	Female
No	1.3_a	2.3_b	2.8_b	2.5_b
Yes	2.1_b	2.3_b	2.1_b	2.7_b

Note. The entire program was viewed without interruption in the intact version; the ending was seen after a delay in the interrupted version. Means with no letter in their subscripts in common differ at $p < .05$ by the Scheffe method.

happiness, although a three-way interaction revealed that the reduction was significant only among girls who saw the intact version of the program. This interaction also qualified a main effect of timing of the ending, which reflected the fact that, overall, subjects who saw the intact version reported less happiness than subjects who saw the ending after a delay.

Prior knowledge of the happy outcome tended to reduce fear during the wading scene and the snake scene, although the effects observed for the snake scene were qualified by interactions with age level and sex. Specifically, subjects who were told about the happy outcome were less likely to report fear during the wading scene. Knowledge of the happy outcome also tended to reduce older subjects' open-ended reports of fear during the snake scene, but unexpectedly tended to increase them among younger subjects. Finally, prior knowledge reduced degree of fear during the snake scene for girls but not boys.

Main effects of sex and age level were also observed. Girls reported more fear than boys during the snake scene, as assessed by both open-ended reports and ratings. There were no other sex differences in self-reports of emotion, but age differences emerged on several measures. Younger subjects tended to report a greater degree of fear during the wading scene than older subjects. However, older subjects began to worry about the threatened character earlier in the program than did younger subjects. Finally, for the homecoming scene, younger subjects were more likely to report positive affect, and reported a greater degree of happiness than older subjects.

Facial Expressions

Facial records were obtained for all but two of the 186 subjects. Because the expression of interest-excitement is affectively neutral and typically reflects attention to the environment, other emotion expressions were considered to be deviations from interest.

An initial examination of the data revealed that several emotion expressions occurred very infrequently or not at all. No subjects showed distress-pain, contempt-scorn, or anger-rage, and only two subjects (1.0%) showed shame-shyness. Due to its low frequency, shame-shyness was excluded from further analysis. The remaining five expressions occurred more often, although the frequency of negative expressions was generally low. Sixty-nine subjects (37.5%) showed enjoyment-joy, 37 subjects (20.1%) showed surprise-astonishment, 10 subjects (5.4%) showed disgust-revulsion, 6 subjects (3.3%) showed fear-terror, and 5 subjects (2.7%) showed sadness-dejection.

Coders recorded the timing of the onset and offset of each emotion expression. Thus, the data for each subject constituted a continuous record of when during the program each emotion was expressed. Because the various scenes in the program differed greatly in content, facial responses during specific scenes were of primary interest. Thus, for purposes of analysis, the program was broken into segments that corresponded to the six primary scenes described in Chapter 2: (1) the boys playing in the waterfall; (2) the boys leaving home in a small boat; (3) the boys sailing on the ocean; (4) the boys wading in the river; (5) the snake appearing and attacking Fritz; and (6) the boys escaping the snake and returning safely home. For each segment, two measures of facial behavior were computed for each emotion expression. The frequency of an expression was based on the number of times the expression occurred during the segment, either alone or as part of a blend with another emotion expression. If an expression continued from one segment to the next, it was counted as having occurred during both segments. The duration of an expression was based on the total length of time (in tenths of seconds) that the expression occurred during the segment, either in the full face or in the upper or lower face only. Due to the relatively low frequency of all expressions, the region of the face in which the expression occurred was not taken into account in the data analysis.

Occurrence of facial expressions. Few subjects showed any facial expression more than once during a given scene. Thus, subjects were classified according to whether they did or did not exhibit each emotion expression during each of the six scenes.

These data, combined across conditions, are presented in Table 10. The distribution of expressions provides some support for the validity of the Affex coding scheme. Expressions of enjoyment were most frequent during the initial scene in which the boys played in the waterfall. This scene was intended to entertain subjects and to elicit their interest in the program; both facial expressions and self-reports of happiness (reported earlier) suggest that the waterfall scene fulfilled this purpose. In addition, many subjects smiled during the next scene, as the boys prepared to leave on their boat, and during the homecoming scene. Smiles during the leaving scene typically occurred when the boys were shown playing in the surf.

The relative frequency with which subjects smiled during the scene involving the snake initially seemed surprising. However, a closer examination of the video records by the primary coder revealed that the smiles of five of these subjects were accompanied by verbal or nonverbal signs of recognition, such as pointing at the screen or commenting about the events to the experimenter (e.g., "That's a boa!"). In addition, there is evidence that smiles are not always indicative of positive affect. Ekman and his colleagues (Ekman, 1972; Ekman, Freisen, & Ancoli, 1980) also reported instances of subjects who smiled as they viewed stressful film scenes. These subjects typically appeared unhappy while they smiled, and the smiles often accompanied or

Table 10

Number of Subjects Exhibiting Each Facial Expression During Each Scene from the Program

	Expression				
Scene	Enjoyment	Surprise	Fear	Disgust	Sadness
Playing	45	8	0	1	0
Leaving	22	8	0	2	3
Sailing	8	8	0	0	0
Wading	3	4	0	2	1
Snake	19	15	6	5	2
Homecoming	23	9	0	2	0

N = 184

Note. The table values reflect the number of subjects who exhibited each facial expression at least once during the indicated scenes.

followed expressions of negative emotion. Ekman and Friesen (1982) have called these expressions "miserable smiles." In the present data, three of the subjects who smiled during the snake scene showed simultaneous evidence of negative facial affect.

The few instances of negative expressions also appear to correspond to relevant portions of the program. Specifically, facial fear occurred only during the snake scene, disgust was expressed most often during the wading or snake scenes, and sadness occurred only when the boys were shown leaving home or were depicted in a dangerous situation.

The data were examined with regard to the effect of prior information on facial expressions. Because fear, disgust, and sadness were extremely infrequent, these expressions were combined to form a measure of negative facial affect. To examine facial expressions in response to specific program content, loglinear analyses were conducted on the presence vs. absence of enjoyment, surprise, and negative affect during particular scenes. To facilitate statistical analysis of the data, responses during the wading scene were combined with those during the subsequent snake scene. These scenes were combined because the wading scene was relatively short (26 s), and both scenes were suspenseful and potentially frightening. Expressions that occurred very infrequently -- surprise and negative affect during all scenes except the wading/snake scene, and enjoyment during the sailing scene -- could not be statistically analyzed. Thus, loglinear analyses were conducted for emotion expressions during the following scenes only: enjoyment during the playing scene, the leaving scene, the wading/snake scene, and the homecoming scene, and surprise and negative affect during the wading/snake scene.

For expressions during all scenes except the homecoming scene, four-way multidimensional contingency tables were constructed, using the variables Threat, Happy Outcome, Age Level, and Expression (present vs. absent). The variable of sex was omitted due to the relatively low frequency of all emotion expressions. For enjoyment during the homecoming scene, the ending was also included as a variable.

The loglinear analyses revealed no significant effects. However, the analysis of enjoyment during the homecoming scene revealed a main effect of the ending that approached significance, $\underline{G}^2$ (1) = 3.32, $p < .07$. Subjects who saw the happy ending after a delay were more likely to smile (17.2%) than were those who saw the entire program intact (7.5%). The interaction between happy outcome and age level also approached significance, $\underline{G}^2$ (1) = 3.08, $p < .08$. Among older subjects, those who had not been told about the happy ending were more likely to smile (22.4%) than were subjects who had been told about the happy ending (9.1%). In contrast, knowledge of the happy outcome appeared to have little effect on smiling among younger subjects (prior knowledge, 11.4%;

no prior knowledge, 7.1%).

Duration of facial expressions. An initial examination was made of the duration data for enjoyment, surprise, and negative affect during the scenes identified above. In all cases, the data distributions were positively skewed, and the assumption of homogeneity of variance was violated (using Cochran's C statistic); the means and standard deviations appeared to be proportional. The major problem with the data was that many of the scores were equal to zero. Thus, no transformation was able to eliminate these problems completely. However, to reduce positive skew and heteroscedasticity, the scores were transformed using a logarithmic transformation (Winer, 1971). To avoid taking the log of zero, a value of 1 was first added to each score.

The positive skews of the distributions were reduced to some degree, but of course could not be eliminated. Skews for the duration of enjoyment, surprise, and negative affect (during the scenes examined in the previous section) were as follows: enjoyment during the playing scene, skew = 1.70; enjoyment during the leaving scene, skew = 3.00; enjoyment during the wading/snake scene, skew = 3.92; enjoyment during the homecoming scene, skew = 3.14; surprise during the wading/snake scene, skew = 4.09; and negative affect during the wading/snake scene, skew = 4.55. The transformations produced homoscedastic distributions only for enjoyment during the playing scene. Analyses of variance were still considered feasible, however, because ANOVA is generally robust with regard to violations of the assumptions of homogeneity of variance and normality, as long as n's are approximately equal (e.g., Kirk, 1982; Glass, Peckham, & Sanders, 1972). In the present study, the range of $\underline{n}$'s (for a 2 x 2 x 2 design) was 21 to 22 among younger subjects, and 24 to 25 among older subjects. There was no tendency for smaller variances to be associated with larger n's.

The analyses reported in this section, with one exception, are 2 x 2 x 2 unweighted-means analyses of variance, using the variables Threat, Happy Outcome, and Age Level. For the analysis of enjoyment during the homecoming scene, the timing of the ending was also included, creating a 2 x 2 x 2 x 2 design. The range of $\underline{n}$'s for this design was 10 to 11 for younger subjects and 12 to 13 for older subjects. As noted above, the ending factor was added because this analysis focused on responses to the conclusion of the program. The variable of sex was excluded due to low cell frequencies. All means reported in the text are means of the transformed scores.

No effects were observed for enjoyment during the playing or leaving scenes. For enjoyment during the wading/snake scene, the main effect of threat approached significance, $\underline{F}$ (1,176) = 2.77, p < .10. Subjects who had been forewarned about the attack tended to smile more ($\underline{M}$ = .10) than did subjects who had not been forewarned (M = .04). As noted above, five subjects who smiled during this sequence also showed signs of recognition while viewing. Four of these subjects had been forewarned, and they may have smiled when they recognized events they had been told to expect.

For surprise during the wading/snake scene, there was a main effect of happy outcome, F (1,176) = 4.95, $p < .03$. Subjects who had been told that the program would have a happy ending showed more surprise during this sequence (M = .07) than did subjects who had not been told about the happy outcome (M = .02). The direction of this effect is consistent with the nature of surprise, which is triggered by events that violate expectations, or are "misexpected" (Charlesworth, 1969). It is likely that the snake attack would have seemed unexpectedly intense to subjects who thought that Fritz would be safe and unharmed at the end of the program. The main effect of happy outcome was qualified, however, by a three way interaction among age level, threat, and happy outcome, F (1,176) = 6.44, $p < .02$. The effect of the happy outcome reached significance only for older subjects who were forewarned of the threat (no prior knowledge, $M = .00_a$; prior knowledge, $M = .13_b$). A similar pattern was observed for younger subjects who were not forewarned (no prior knowledge, $M = .00_a$; prior knowledge, $M = .08_{ab}$), but not for the two other groups (older subjects, not forewarned, $Ms = .03_a$, $.04_a$; younger subjects, forewarned, $\underline{M}$s = $.04_a$, $.02_a$). Clearly, the finding was not very robust. There were no effects associated with the expression of negative affect.

The analysis of enjoyment during the homecoming scene revealed a main effect of the timing of the ending, $\underline{F}$ (1,168) = 6.50, p < .02. Subjects smiled more when the ending was delayed (interrupted version, $\underline{M}$ = .11) than when the ending was a continuous part of the program (intact version, $\underline{M}$ = .03). This finding, which was also observed in the loglinear analysis, is consistent with self-reports of happiness during the homecoming scene (reported previously): subjects who saw the ending after a delay reported greater happiness than those who saw the ending without interruption. It may be that the intact program did not allow sufficient time for subjects to shift their thoughts from the upsetting snake scene to the happy ending.

The analysis also revealed a marginally significant main effect of happy outcome, $\underline{F}$ (1,168) = 3.63, p < .06, and a Happy Outcome x Age Level interaction, $\underline{F}$ (1,168) = 4.21, p < .05. Knowledge of the happy outcome had no effect on smiling among younger subjects ($\underline{M}$s = .05 for both groups). In contrast, older subjects smiled more when they had no prior knowledge of the happy outcome ($\underline{M}$ = .16) than when they knew that the program would end happily ($\underline{M}$ = .04). It seems likely that for older children, witnessing the boys' safe return produced greater relief, and hence pleasure, among those who did not know how the program would be resolved than among those who had been reassured that it would end happily. Both the main effect of the ending and the interaction between happy outcome and age level are consistent with the pattern of results that emerged in the loglinear analysis reported above, which considered only the frequency of subjects who smiled.[7]

Summary of analyses of facial expressions. Facial expressions of enjoyment, surprise, and negative affect tended to occur during scenes that would be expected to induce these emotions. Overall, expressions of negative affect were rare, and no significant effects were associated with this measure. Some effects did emerge for enjoyment and surprise during the wading/snake scene and the homecoming scene.

Forewarning of the threat was associated with more smiling during the wading/snake scene, although the effect only approached significance. As noted above, this unexpected finding may be due to smiling in recognition (when expectations were confirmed), or to the possibility that smiles reflected negative affect for some subjects. Forewarning had no other effects on facial expressions.

Prior knowledge of the happy outcome increased surprise during the wading/snake scene, although this finding was qualified by a three-way interaction. The increase in surprise was significant only for older subjects who had been forewarned about the threat. In addition, prior knowledge of the happy outcome reduced smiling during the homecoming scene among older subjects, but not younger subjects. This finding emerged for both the duration of smiling and the number of subjects who smiled, although the latter effect only approached significance.

The timing of the ending also affected smiling during the homecoming scene. Both the duration of smiling and the number of subjects who smiled was greater for those who saw the happy ending after a delay than for those who saw the intact version of the program. The effect for the number of subjects who smiled, however, only approached significance.

No overall age differences emerged for any of the analyses. Sex differences could not be observed, since this variable was eliminated due to small cell sizes.

Physiological Responses

Base levels for skin temperature and heart rate were obtained by computing the mean response for each measure during a 20-s period that was recorded while subjects viewed nonarousing scenes of nature. This 20-s period began 3 min 3 s into the videotape, so subjects had already had an opportunity to become accustomed to the viewing situation.

Changes in subjects' physiological responses over time were of primary interest because the present study was concerned with the effects of prior knowledge on anticipation and suspense. To examine physiological changes over time, the 4 min 50 s program was divided into smaller intervals. The first 50 s of data for the program, which corresponded to the playing scene, were excluded from analysis, and the remaining time was divided in four intervals of 1 min each. The mean response level for each of these intervals was calculated.

There were at least two reasons for excluding the initial 50 s of the program from analysis. First, to compare mean physiological responses across time, equal intervals are preferable to avoid weighting one time period more than another. The length of the interval that could be selected was limited by the fact that physiological data for the final 1 min segment of the program was obtained only for subjects who saw the program without interruption. To permit this scene to be excluded from analyses involving the entire sample of subjects, it was necessary that the 1 min segment could be divided evenly by the length of the interval selected. Four 1 min segments seemed sufficient to reveal increases or decreases in physiological responses across time, and permitted a simpler presentation of the data than would be possible with more segments of shorter duration.[8]

Another reason for excluding the first 50 s of data was that the first scene (the playing scene, 56 s) was included in the program primarily to stimulate interest and to familiarize subjects with the characters. Responses during this scene were not of theoretical interest. Two subsequent scenes occurred prior to the beginning of the suspenseful wading sequence. As noted previously, the first of these two scenes (the leaving scene, 54 s) generally conveys a happy mood, and was not expected to elicit fear or suspense. The second of these scenes (the sailing scene, 52 s) was calm and uneventful, but could be interpreted as mildly suspenseful. These two scenes correspond approximately to the first and second 1 minute time periods, respectively. Specifically, the first minute includes the last 6 s of the playing scene, plus the entire scene in which the boys leave home. The second minute includes the entire sailing scene, plus the first 8 s of the wading scene. The third minute includes the last 18 s of the wading scene and the entire snake attack. The 60 s homecoming scene comprises the fourth segment. Thus, the use of four 1 min intervals produces segments of equal length that correspond to meaningful program content.

The decision to use mean response levels, rather than second-by-second changes, was made for several reasons. First, the hypotheses predicted differences in subjects' overall level of arousal across scenes, not momentary reactions to brief events. In addition, skin temperature changes slowly, and thus large moment-to-moment fluctuations were not expected. Finally, rapid fluctuations in heart rate are difficult to interpret. Obrist et al. (1982) argue that tonic heart rate (heart rate averaged over blocks of time) may be a much better indicator of emotional state than phasic heart rate changes.

The physiological data for six subjects (1 boy and 3 girls in the younger group, 1 boy and 1 girl in the older group) were lost due to equipment failure. The heart rate data for an additional 11 subjects were excluded due to extremely erratic readings. Eight of these subjects (5 boys and 3 girls) were in the younger group, and three (2 boys and 1 girl) were in the older group. During the study, the experimenter monitored the physiological readings on a video monitor, and the erratic heart rates for these subjects was not associated with hand or body movement. Rather, during the course of the study, a pattern seemed to emerge: subjects whose heart rate showed extreme fluctuation throughout the session either had very small fingers, or had asked the experimenter to loosen the velcro band used to attach the photoplethysmograph. The erratic readings may due to the fact that the sensor was not pressed closely enough against the flesh of the subject's finger, thus causing interference with the reflection of light through the finger. Altogether, 180 subjects were included in analyses of skin temperature, and 169 subjects were included in analyses of heart rate. The reduction in the number of subjects was approximately equal across conditions.

It will be recalled that one-half of the subjects saw the entire program without interruption (intact version), but the other half saw the happy ending after a delay (interrupted version). As noted above, physiological responses to the ending were not obtained for subjects who saw the interrupted version. The data for these subjects would have been confounded by the length and content of the intervening time period, because subjects answered questions about their reactions to the show during the interruption. Thus, analyses that involved physiological responses to the happy ending included only subjects who had seen the intact version.

For both skin temperature and heart rate, the base level was obtained for use as a covariate. The adjustments made in the analysis of covariance (ANCOVA), to remove the effect of a covariate, are based on averaged within group regression coefficients. Thus, the use of ANCOVA requires that the relationship between the covariate and the dependent measure is similar across groups. This is the assumption of homogeneity of regression, or parallel within-group regression lines. The violation of this assumption introduces error into the adjustment of means and reduces the sensitivity of the F test. Preliminary analyses revealed that the homogeneity of regression assumption was met for the skin temperature data, but not for the heart rate data.

The problem with the heart rate data was not unexpected, since heart rate shows a marked decrease with age (Hirshman &

Katkin, 1974). If there are large differences across groups on the covariate, the homogeneity of regression assumption is likely to be violated (Keppel, 1982). To overcome the problem associated with the Covariate x Age Level interaction, separate within-group regression coefficients were used to relate the covariate to the dependent variables within the two age groups (cf. Armstrong, 1988). Specifically, separate covariates were constructed for the two age groups by letting the scores on the covariate vary normally within one group, but setting the scores for the other group equal to the mean of the covariate in the first group. In other words, each covariate exhibited variance within the cells associated with one age group, and no variance within the cells associated with the other group. By using two covariates constructed in this manner, scores on the dependent variables were adjusted according scores on the covariate within age groups.

Analyses of skin temperature and heart rate that involved the entire sample of subjects were 2 x 2 x 2 x 2 x 3 unweighted-means, repeated-measures analyses of covariance, with Threat, Happy Outcome, Age Level, and Sex as between-subjects factors, Time as a repeated factor with three levels, and base level physiological response as the covariate. A single covariate was used for skin temperature, but as described above, two covariates were used for heart rate. Analyses involving only subjects who saw the intact version of the program used the same design, with the exception that an additional level was added to the repeated factor, producing a 2 x 2 x 2 x 2 x 4 design. Because the sphericity assumption was violated for all analyses, effects associated with the repeated factor were evaluated using the Geisser-Greenhouse correction. For the sake of convenience, the four time periods will sometimes be referred to by the names of the scenes that correspond most closely to each: time period 1, the leaving scene; time period 2, the sailing scene; time period 3, the snake scene; and time period 4, the homecoming scene. Adjusted means are reported for both skin temperature and heart rate. Means that have no letter in their subscripts in common differ at $p < .05$ by the Scheffe method.

Skin temperature. The analysis of skin temperature for the entire sample (N = 180) resulted in a marginally significant main effect of age level, F (1,163) = 3.10, $p = .08$, and an interaction between age level and sex, F (1,163) = 8.88, $p < .005$. Overall, younger subjects tended to have lower skin temperature (M = 31.09) than did older subjects (M = 31.34). However, the interaction with sex revealed that this age difference was observed among girls (younger, $M = 30.89_a$; older, $M = 31.54_b$), but not among boys (younger, $M = 31.30_{ab}$; older, $M = 31.14_{ab}$).

The analysis also revealed a main effect of time, F (2,328) = 3.78, $p < .05$. Overall, skin temperature was similar during the first two time periods, and then increased during the third period (the snake scene). This effect was qualified, however, by the predicted interactions between time and threat forewarning, F $(2,328) = 4.59$, $p < .03$, and between time and happy outcome, F $(2,328) = 3.86$, $p < .05$. The means associated with these effects are presented in Table 11. As can be seen in the upper portion of the table, subjects who had been forewarned about the snake attack showed a slight but nonsignificant decrease in skin temperature over time, whereas subjects who were not forewarned showed an increase in skin temperature during the snake scene. Because a decrease in skin temperature reflects an increase in arousal, these data indicate that during the program, forewarned subjects showed a slight increase in arousal, but subjects who were not forewarned became more relaxed. Forewarned subjects also had significantly lower skin temperature during the snake scene than did subjects who had not been forewarned. This finding is consistent with the expectation that forewarning would increase emotional arousal.

The lower portion of Table 11 shows that subjects without prior knowledge about the happy ending showed no significant change in skin temperature over time, whereas subjects who had been told about the happy ending showed an increase in skin temperature during the snake scene. Furthermore, subjects who knew that the program would end happily had significantly higher skin temperature during the snake scene than did subjects without

Table 11

Adjusted Mean Skin Temperature as a Function of Prior Information and Time -- Entire Sample

	Threat Forewarning		
Time Period	No	Yes	Combined
1	31.21_a	31.20_a	31.21_{AB}
2	31.20_a	31.17_a	31.18_A
3	31.34_b	31.17_a	31.26_B

	Happy Outcome Information	
Time Period	No	Yes
1	31.23_a	31.18_a
2	31.18_a	31.19_a
3	31.21_a	31.31_b

Note. Skin temperature was recorded in degrees centigrade. Mean responses were adjusted for base level skin temperature. Means in the same row or column with no lowercase letter in their subscripts in common differ at $p < .05$ by the Scheffe method. Means with no uppercase letter in their subscripts in common also differ at $p < .05$ by Scheffe.

knowledge of the happy ending. This finding supports the expectation that prior knowledge of the happy outcome would reduce emotional arousal.

To examine the change in skin temperature in response to the homecoming scene, a second analysis was conducted involving only subjects who saw the intact version of the program ($n = 93$). The analysis again revealed an Age Level x Sex interaction, F (1,76) = 4.04, $p < .05$. The pattern was similar to the one for the entire sample, although none of the comparisons among means were significant. A significant Time x Threat interaction was also observed, F (3,231) = 3.37, $p < .05$. As can be seen in the upper portion of Table 12, subjects who were forewarned about the threat showed a slight but nonsignificant decrease across the four time periods. Even during the homecoming scene, no increase in skin temperature occurred. In contrast, subjects who were not forewarned showed a trend toward increasing skin temperature over time, with the increase reaching significance during the homecoming scene (compared to means for the leaving and sailing scenes). Although the difference in skin temperature between the two groups during the snake scene was not significant for this subsample of subjects, the means are similar to those for the entire sample: subjects who were forewarned tended to have lower skin temperature than did those who were not forewarned. The difference between the two groups during the homecoming scene

Table 12

Adjusted Mean Skin Temperature as a Function of Prior Information and Time -- Intact Version Only

	Threat Forewarning	
Time Period	No	Yes
1	31.28_{a}	31.28_{a}
2	31.28_{a}	31.25_{a}
3	31.35_{ab}	31.23_{a}
4	31.54_{b}	31.22_{a}

	Happy Outcome Information	
Time Period	No	Yes
1	31.30	31.25
2	31.27	31.26
3	31.27	31.31
4	31.25	31.51

Note. Skin temperature was recorded in degrees centigrade. Mean responses were adjusted for base level skin temperature. Means in the same row or column with no letter in their subscripts in common differ at $p < .05$ by the Scheffe method.

reached significance, with lower skin temperature among those who were forewarned about the threat.

The interaction between time and happy outcome approached significance in this analysis, F (3,231) = 2.69, $p < .09$. As the lower portion of Table 12 shows, subjects who had prior knowledge of the happy ending tended to show an increase in skin temperature over time, whereas those who did not have prior knowledge showed a slight decrease over time. The difference between the two groups is most apparent during the homecoming scene. Although the interaction was not significant, Dunn planned comparisons between the two groups for each time period revealed that subjects without prior knowledge about the happy outcome had significantly lower skin temperature during the homecoming scene than did subjects who had been told that the program would end happily. The other comparisons were not significant.

Heart rate. The analysis of heart rate for the entire sample (N = 169) revealed a main effect for age level, F (1,151) = 162.61, $p <. 001$, and a main effect for sex, F (1,151) = 4.22, $p < .05$. Younger subjects had higher heart rate (M = 99.9) than older subjects (M = 89.8), and girls had higher heart rate (M = 95.7) than boys (M = 94.0). The analysis also revealed a main effect of time, F (2,306) = 15.79, $p < .001$, and an interaction between time and age level, F = 7.69, $p < .001$. As can be seen in Table 13, overall, subjects had significantly higher heart rate during the

Table 13

Adjusted Mean Heart Rate as a Function of Age Level and Time -- Entire Sample

	Age (in years)		
Time Period	5-7	9-11	Combined
1	98.9_c	88.8_a	93.9_A
2	99.0_c	90.3_b	94.7_A
3	101.8_d	90.2_b	96.0_B

Note. Heart rate was recorded in beats-per-minute. Mean responses were adjusted for base level heart rate. Means in the same row or column with no letter in their subscripts in common differ at $p < .05$ by the Scheffe method. Means with no uppercase letter in their subscripts in common also differ at $p < .05$ by Scheffe.

snake scene than during the leaving or sailing scenes, although heart rate generally increased across the three time periods. Although heart rate increased in both age groups from time period 1 to time period 3, the interaction is due to the fact that older subjects showed a significant increase in heart rate earlier in the program than did younger subjects. This pattern is consistent with subjects' self-reports of when they first began to worry about Fritz: older subjects reported worrying earlier in the program than did younger subjects. There were no effects associated with threat forewarning or prior knowledge of the happy outcome.

To examine changes in heart rate in response to the homecoming scene, a second analysis was conducted using only subjects who saw the intact version of the program (n = 87). This analysis again revealed a main effect of age level, F (1,69) = 102.56, $p < .001$, with higher heart rate among younger subjects (M = 100.2) than among older subjects (M = 88.4). The four-way interaction among threat, happy outcome, age level, and sex was also significant, F (1,69) = 4.41, $p < .04$, although there was no interpretable pattern among the means.

The analysis also revealed a main effect of time. As can be seen in Table 14, heart rate showed a significant increase across the first three time periods, followed by a slight decrease. In fact, the means show that subjects' heart rate decreased during

Table 14

Adjusted Mean Heart Rate as a Function of Threat Forewarning and Time -- Intact Version Only

	Threat Forewarning		
Time Period	No	Yes	Combined
1	93.2	94.4	93.8_{A}
2	93.0	95.2	94.1_{AB}
3	95.8	95.2	95.5_{B}
4	93.7	94.5	94.1_{AB}

Note. Heart rate was recorded in beats-per-minute. Mean responses were adjusted for base level heart rate. Means with no letter in common in their subscripts differ at $p < .05$ by the Scheffe method.

the homecoming scene to the level that was recorded before the snake scene began. If heart rate had been recorded for a longer period of time, it seems likely that the magnitude of the decrease would have reached significance. A marginally significant interaction between time and threat forewarning also emerged in the analysis, $\underline{F}$ (3,213) = 2.42, $p < .08$. The pattern of means in Table 14 shows that subjects who were forewarned about the threat tended to have higher heart rate early in the program, and showed little change in heart rate over time. Conversely, subjects who were not forewarned tended to show an increase in heart rate during the snake scene and a decrease during the homecoming scene.[9]

Summary of analyses of physiological responses. Across all subjects, changes in heart rate, but not skin temperature, were consistent with the events depicted in the program. Despite the fact that subjects viewed a potentially frightening film sequence, skin temperature generally tended to increase over time, indicating relaxation. There are at least two possible reasons for this finding. It may be that the novel experimental procedures initially aroused subjects, and that later in the session, their skin temperature increased as they relaxed. However, since the experimental film was preceded by nearly five minutes of nonarousing programs, and since heart rate did not decrease over time, this explanation seems unlikely. A more plausible explanation is that the rooms in which the experiment was conducted tended to be warm (approximately 75 degrees F), and may have contributed to an overall increase in skin temperature. In contrast, changes in changes in heart rate corresponded to the major events in the program. Heart rate increased during the snake scene and tended to decrease during the homecoming scene.

The expected effects of threat forewarning emerged clearly in the analysis of skin temperature. An interaction between threat forewarning and time revealed that skin temperature decreased slightly (but nonsignificantly) over time among subjects who were forewarned, but increased over time among subjects who were not forewarned. During the wading and snake scenes, forewarned subjects had significantly lower skin temperature, and thus were more aroused, than subjects who had not been forewarned. Furthermore, during the homecoming scene, skin temperature continued to rise among subjects who had not been forewarned, indicating increased relaxation, but did not change among forewarned subjects. Although the different patterns observed for the two groups were consistent with predictions, it had been expected that forewarning would produce a decrease in skin temperature. Instead, it appears that the threat forewarning counteracted the general trend toward increased skin temperature or relaxation.

There was some evidence that threat forewarning also influenced heart rate. Although no effects associated with forewarning emerged in the analysis involving all subjects, an effect emerged when responses to the homecoming scene were examined. This analysis, involving only subjects who saw the intact version of the program, revealed a marginally significant interaction between threat forewarning and time. Subjects who had not been forewarned tended to show an increase in heart rate during the snake scene and a decrease during the homecoming scene, whereas forewarned subjects tended to have a higher heart rate early in the program, and to show a smaller decrease during the homecoming scene. It should be noted, however, that the effect of threat forewarning on heart rate was not strong and was limited to this subgroup of subjects.

Prior knowledge of the happy outcome had the expected effect on skin temperature. An interaction between happy outcome information and time revealed that subjects who knew about the happy outcome showed an increase in skin temperature over time, whereas subjects who did not know about the happy outcome showed no change. Furthermore, during the snake scene, lower skin temperature (i.e., greater arousal) was observed among subjects without prior knowledge, and these subjects showed no relaxation during the homecoming scene. In contrast, among subjects who had prior knowledge, skin temperature continued to increase during the homecoming scene.

Age and sex differences were also observed for both skin temperature and heart rate. Younger children tended to have lower skin temperature than older children, but this age difference was limited to girls. Overall, younger children had much higher heart rate than older children. In addition, an interaction between age level and time showed that older subjects showed an increase in heart rate earlier in the program than did younger subjects. Finally, girls had higher heart rate than boys.

Relations Among Measures of Emotion

Correlations were computed among self-report, facial, and physiological indicators of emotional response to determine the degree of correspondence among the various measures. The self-report measures were ratings of happiness, fear, and worry. The measures of facial expression were the transformed duration scores for enjoyment, surprise, and negative affect during the scenes specified above. For physiological responses, mean skin temperature and heart rate during each of the four 1 min intervals were used. Data for the two age groups were combined. Age was partialed from all correlations, and base-level skin temperature and heart rate were partialed from correlations involving those measures. One-tailed tests were used to evaluate significance.

Self-reports of emotion. Correlations among ratings of emotion are presented in Table 15. Not surprisingly, ratings of fear during the sailing, wading, and snake scenes were moderately

Table 15

Correlations Among Ratings of Emotion, Controlling for Age

	Fear Sailing	Fear Wading	Fear Snake	Happiness Homecoming	Worry
Happiness Playing	.03	.03	.09	.13*	.28***
Fear Sailing	--	.31***	.21**	.01	.16*
Fear Wading		--	.47***	.07	.40***
Fear Snake			--	.06	.46***
Happiness Homecoming				--	.23***
Worry					--

@ $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

Note. The N for all correlations is 186.

intercorrelated, and were not correlated with reports of happiness. Surprisingly, worry was positively related to all other ratings of emotion. It may be that worry arose primarily from empathy with the characters, whereas feelings of happiness and fear arose from the specific situations depicted (e.g., fun activities, a large snake), as well as from empathy. In this case, empathy with the characters could account for the relationships between worry and the other emotions, whereas the differences in content between typically happy and fear-provoking scenes could account for the low correlations among ratings of happiness and fear.

Facial expressions. Correlations among facial expressions of enjoyment, surprise, and negative affect are presented in Table 16. Significant correlations were observed between all measures of enjoyment, with the exception that enjoyment during the snake scene was significantly related only to enjoyment during the homecoming scene. Enjoyment during the playing scene was also related to surprise during the snake scene. Finally, negative facial affect during the snake scene was correlated with enjoyment during the same scene. This relationship is consistent with the finding (reported above) that smiling during the snake scene occurred more often among forewarned subjects, and was sometimes accompanied by facial signs of negative affect.

Correlations were also computed among the measures of total

Table 16

Correlations Among Duration of Facial Expressions During Specific Scenes, Controlling for Age

	Leaving EJ	Wd/Snake EJ	Wd/Snake SA	Wd/Snake NEG	Homecoming EJ
Playing EJ	.25***	.05	.17*	.02	.23***
Leaving EJ	--	.02	.02	.08	.20**
Wading/Snake EJ		--	.01	.13*	.24***
Wading/Snake SA			--	.08	.04
Wading/Snake NEG				--	.05
Homecoming EJ					--

@ $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

Note. The N for all correlations is 184. The labels for facial expressions specify the scene during which the expression occurred. The facial expressions are referred to by the following abbreviations: EJ = enjoyment; SA = surprise; and NEG = negative emotions (fear, disgust, and sadness). The data for the wading and snake scenes were combined for analysis, and the label "Wd/Snake" is used to conserve space. The duration data for facial expressions were transformed using a logarithmic transformation.

duration of enjoyment, surprise, and negative affect. All three expressions were positively correlated. Enjoyment was related to surprise, $r = .22$, $p = .002$, and negative affect was related to both enjoyment and surprise, $r = .14$, $p < .04$ for both. In other words, subjects who showed one type of facial expression were likely to show others as well. This finding suggests that the observed relationships among expressions are partially due to individual differences in facial expressiveness.

Physiological responses. Correlations between skin temperature and heart rate were computed during the first three time periods for all subjects, and during all four time periods for subjects who had seen the intact version of the program. The correlations are presented in Table 17. Because arousal is reflected by a decrease in skin temperature and an increase heart rate (Ekman et al., 1983), negative correlations between the two measures were expected. However, none of the correlations were significant, and the two that approached significance were positive. The overall relationship between skin temperature and heart rate was also examined. The two measures were uncorrelated, both within the entire sample (averaged over the first three time periods, $r = .05$) and within the group that saw the intact version (averaged over all four time periods, $r = .02$). Thus, in general, heart rate and skin temperature were not related in the present study.

Table 17

Correlations Between Skin Temperature and Heart Rate Over Time, Controlling for Base Levels of Physiological Measures and Age

ENTIRE SAMPLE

	Skin Temperature		
Heart Rate	Time 1	Time 2	Time 3
Time 1	.02	-.01	-.03
Time 2	.11●	.10●	.09
Time 3	-.01	-.02	-.01

INTACT VERSION ONLY

	Skin Temperature			
Heart Rate	Time 1	Time 2	Time 3	Time 4
Time 1	-.04	-.06	-.09	-.06
Time 2	.13	.12	.10	.12
Time 3	.02	.03	.04	.06
Time 4	-.09	-.07	-.03	.04

● $p < .10$

Note. For the entire sample, $\underline{N}$ = 167. For subjects who saw the intact version, $\underline{n}$ = 87.

Although both skin temperature and heart rate reflect autonomic arousal, their involvement in different homeostatic processes may result in a lack of correspondence between measures (Derryberry & Rothbart, 1984; Hodgson & Rachman, 1974). In addition, low correlations may be due to response stereotypy (Lacey & Lacey, 1958), or the tendency for individuals to respond more strongly in some physiological channels than others.

Facial expressions and self-reports of emotion. Facial expressions of enjoyment, surprise, and negative affect were correlated with ratings of happiness, fear, and worry. Table 18 shows that facial expressions and self-reports were not strongly related. Several correlations approached significance, however, and two of these were consistent with expectations or other results. The relationship between happiness during the homecoming scene and smiling during the same scene ($p = .06$) supports the validity of the self-report measure. The relationship between smiling during the wading/snake scene and fear during the snake scene ($p = .09$) is consistent with other findings. As reported above, smiling during the wading/snake scene was correlated with negative facial affect during the same scene, and there was some evidence that some of the smiles may have been "miserable smiles" that reflected negative rather than positive feelings (Ekman & Friesen, 1982).

Table 18

Correlations Among Ratings of Emotion and Duration of Facial Expressions, Controlling for Age

Facial Expression	Self Reports of Emotion					
	Happiness Playing	Fear Sailing	Fear Wading	Fear Snake	Happiness Homecoming	Worry
Playing EJ	-.01	.00	-.07	.02	.06	.06
Leaving EJ	-.01	-.05	-.09	-.04	.08	-.02
Wd/Snake EJ	-.06	-.06	.07	.10@	-.04	-.06
Wd/Snake SA	.02	-.06	.00	-.01	.02	-.02
Wd/Snake NEG	.10@	.03	.05	.04	-.04	.07
Homecoming EJ	.00	-.05	.04	-.01	.11@	-.05

@ $p < .10$

Note. The N for all correlations is 184. The labels for facial expressions specify the scene during which the expression occurred. Facial expressions are referred to by the following abbreviations: EJ = enjoyment; SA = surprise; and NEG = negative emotions (fear, disgust, and sadness). The data for the wading and snake scenes were combined for analysis, and the label "Wd/Snake" is used to conserve space. The duration data for facial expressions were transformed using a logarithmic transformation.

Physiological responses and self-reports of emotion. Correlations were computed between skin temperature and heart rate over time and ratings of happiness, fear, and worry. Correlations with skin temperature are presented in Table 19. For the entire sample of subjects, degree of fear during the sailing and wading scenes was negatively related to skin temperature during all three time periods, although the correlations were not significant. Among subjects who saw the intact version of the program, the correlations were significant, but only for fear during the wading scene. A negative relationship between fear and skin temperature was expected, since lower skin temperature indicates higher arousal. However, the fact that the negative correlations were observed even during the first time period was surprising. It may be that some subjects who reported higher levels of fear during the sailing and wading scenes began to feel apprehensive earlier in the program, and thus began to show a decrease in skin temperature at that time.

Fear during the snake scene was unrelated to skin temperature. The snake scene differed from the sailing and wading scenes in that fear during the snake scene undoubtedly arose suddenly in response to the onscreen attack, whereas fear during the other scenes involved anticipation of frightening events. Skin temperature responds slowly, and fear associated with anticipation may have produced a steady decrease in skin

Table 19

Correlations Among Ratings of Emotion and Skin Temperature,

Controlling for Base Level Skin Temperature and Age

ENTIRE SAMPLE

	Skin Temperature		
Self Reports	Time 1	Time 2	Time 3
Happiness Playing	.00	-.01	-.01
Fear Sailing	-.09	-.10@	-.12@
Fear Wading	-.11@	-.11@	-.10@
Fear Snake	.04	.05	.03
Happiness Homecoming	.03	.03	.06
Worry	.04	.03	.03

INTACT VERSION ONLY

	Skin Temperature			
Self Reports	Time 1	Time 2	Time 3	Time 4
Happiness Playing	.07	.05	.05	.07
Fear Sailing	.06	.06	.02	.02
Fear Wading	-.24**	-.24**	-.21*	-.16@
Fear Snake	-.02	-.04	-.05	-.08
Happiness Homecoming	.13	.13	.19*	.23*
Worry	.06	.03	.03	.05

@ $p < .10$ * $p < .05$ ** $p < .01$

Note. For the entire sample, $\underline{N}$ = 180. For subjects who saw the intact version, $\underline{n}$ = 93.

temperature. A sudden fear response, however, may not have had a measurable effect on skin temperature until a later point in time.

For subjects who saw the intact version, there was a positive relationship between happiness during the homecoming scene and skin temperature before and during that scene. In other wor's, subjects who were less aroused (i.e., had higher skin temperature) reported greater happiness. This finding is inconsistent with the view that arousal from a previous scene should intensify subsequent emotions (Zillmann, 1980). It may be that subjects who were more highly aroused from viewing the frightening scene had a more difficult time shifting the focus of their thoughts from that scene to the happy events of the homecoming scene. This interpretation is consistent with the fact that subjects who saw the intact program generally reported less happiness and smiled less during the homecoming scene than did subjects who saw the ending after a delay.

Correlations between self-reports and heart rate are presented in Table 20. None of the correlations were significant, and the few that approached significance were not readily interpretable.

Facial expressions and physiological responses. Tables 21 and 22 show that there was little relationship between facial expressions and skin temperature. Tables 23 and 24 show that facial expressions and heart rate were not strongly related.

Table 20

Correlations Among Ratings of Emotion and Heart Rate.

Controlling for Base Level Heart Rate and Age

ENTIRE SAMPLE

	Heart Rate		
Self Reports	Time 1	Time 2	Time 3
Happiness Playing	-.08	-.03	-.07
Fear Sailing	.08	-.04	.06
Fear Wading	.00	-.13@	-.11@
Fear Snake	.00	-.10	.03
Happiness Homecoming	.01	.00	.05
Worry	.00	-.08	-.13

INTACT VERSION ONLY

	Heart Rate			
Self Reports	Time 1	Time 2	Time 3	Time 4
Happiness Playing	-.16@	-.06	-.04	-.03
Fear Sailing	.02	-.04	.09	-.07
Fear Wading	.05	-.07	.03	.00
Fear Snake	-.04	-.05	.14	-.02
Happiness Homecoming	.01	.04	-.05	-.06
Worry	.02	-.02	-.01	-.04

@ $p < .10$

Note. For the entire sample, $\underline{N} = 169$. For subjects who saw the intact version, $\underline{n} = 87$.

Table 21

Correlations Among Duration of Facial Expressions and Skin Temperature, Controlling for Base Level Skin Temperature and Age -- Entire Sample

Facial Expression	Skin Temperature		
	Time 1	Time 2	Time 3
Playing EJ	-.03	.00	-.02
Leaving EJ	-.07	-.08	-.10
Wading/Snake EJ	-.06	-.05	-.03
Wading/Snake SA	-.11@	-.09	-.06
Wading/Snake NEG	-.01	-.04	-.05
Homecoming EJ	-.03	-.06	-.04

@ $p < .10$

Note. The N for all correlations is 178. The labels for facial expressions specify the scene during which the expression occurred. Facial expressions are referred to by the following abbreviations: EJ = enjoyment; SA = surprise; and NEG = negative emotions (fear, disgust, and sadness). The data for the wading and snake scenes were combined for analysis. The duration data for facial expressions were transformed using a logarithmic transformation.

Table 22

Correlations Among Duration of Facial Expressions and Skin Temperature, Controlling for Base Level Skin Temperature and Age -- Intact Version Only

Facial Expression	Skin Temperature			
	Time 1	Time 2	Time 3	Time 4
Playing EJ	.01	.04	-.00	-.01
Leaving EJ	-.07	-.03	-.04	-.04
Wading/Snake EJ	-.08	-.09	-.09	-.07
Wading/Snake SA	-.07	-.03	-.02	.07
Wading/Snake NEG	.06	.02	.00	.06
Homecoming EJ	-.15@	-.17*	-.12	-.11

@ $p < .10$ * $p < .05$

Note. The N for all correlations is 93. The labels for facial expressions specify the scene during which the expression occurred. Facial expressions are referred to by the following abbreviations: EJ = enjoyment; SA = surprise; and NEG = negative emotions (fear, disgust, and sadness). The data for the wading and snake scenes were combined for analysis. The duration data for facial expressions were transformed using a logarithmic transformation.

Table 23

Correlations Among Duration of Facial Expressions and Heart Rate, Controlling for Base Level Heart Rate and Age -- Entire Sample

Facial Expression	Heart Rate		
	Time 1	Time 2	Time 3
Playing EJ	-.06	-.16*	.03
Leaving EJ	.01	.06	.04
Wading/Snake EJ	-.09	-.10@	-.09
Wading/Snake SA	-.05	.02	.01
Wading/Snake NEG	.09	.05	.07
Homecoming EJ	-.03	-.05	-.10@

@ $p < .10$ * $p < .05$

Note. The $\underline{N}$ for all correlations is 167. The labels for facial expressions specify the scene during which the expression occurred. Facial expressions are referred to by the following abbreviations: EJ = enjoyment; SA = surprise; and NEG = negative emotions (fear, disgust, and sadness). The data for the wading and snake scenes were combined for analysis. The duration data for facial expressions were transformed using a logarithmic transformation.

Table 24

Correlations Among Duration of Facial Expressions and Heart Rate, Controlling for Base Level Heart Rate and Age -- Intact Version Only

Facial Expression	Heart Rate			
	Time 1	Time 2	Time 3	Time 4
Playing EJ	.00	-.19*	.11	.06
Leaving EJ	.02	-.03	.02	.06
Wading/Snake EJ	-.04	-.11	-.14	-.13
Wading/Snake SA	-.01	.14●	.08	.24*
Wading/Snake NEG	.10	.09	.11	.05
Homecoming EJ	-.03	-.08	-.12	-.13

● $p < .10$ * $p < .05$

Note. The $\underline{N}$ for all correlations is 87. The labels for facial expressions specify the scene during which the expression occurred. Facial expressions are referred to by the following abbreviations: EJ = enjoyment; SA = surprise; and NEG = negative emotions (fear, disgust, and sadness). The data for the wading and snake scenes were combined for analysis. The duration data for facial expressions were transformed using a logarithmic transformation.

Across the four tables, a few correlations reached or approached significance, but no consistent pattern emerged.

Self-Reports of Coping Strategies

Based on a preliminary examination of the data, a coding scheme was developed for subjects' self-reports of the coping strategies they used while viewing the snake scene. No subject reported using more than one strategy. As it turned out, only three different types of strategies were reported by at least 5% of the total sample: (1) *Happy outcome* (17.7%): the subject expected that Fritz would escape, or that the show would end happily (e.g., "I kept telling myself he'd be OK;" "I thought that everything's going to be alright in the end"); (2) *Unreality* (8.1%): the subject told him/herself that the events in the program were not real (e.g., "I told myself it's just a movie;" "it's fiction"); (3) *Distraction* (8.1%): the subject reported thinking about something else, typically something happy (e.g., "I thought about pretty butterflies;" "I thought about something good, like cartoons"). In addition to these more frequently cited strategies, eight subjects (four at each age level) adopted an alternative perspective on the events (e.g., "I pretended it wasn't happening;" "I was looking at the snake's point of view"), and three subjects (one younger, two older) reported using a physical coping or avoidance strategy (e.g., "I clenched my free hand in a fist;" "I tried not listening and shutting my eyes").

For purposes of statistical analysis, these latter two categories were combined with idiosyncratic responses, and were classified as *Other* (7.0%). Finally, a substantial number of subjects (59.1%) reported that they had not used any coping strategy. Responses were categorized by two coders, who agreed on 97.8% of the classifications. Disagreements were resolved by a third coder.

A four-way multidimensional contingency table was constructed, using the variables Threat, Happy Outcome, Age Level, and Coping Strategy. The variable of sex was excluded due to the small cell sizes associated with several of the response categories. A loglinear analysis revealed only a main effect of age level, $\underline{G}^2$ (4) = 17.96, p = .001. As Table 25 indicates, older subjects were more likely than younger subjects to report telling themselves that the show would have a happy ending or that the events were not real. Younger subjects were more likely to report using a distraction strategy, or no strategy at all. Although the effect of happy outcome information was not significant, children who had heard about the happy ending were somewhat more likely to report anticipating a happy resolution as they viewed the snake attack (22.6%) than were subjects who had not heard about the happy ending (12.9%).

In a second loglinear analysis, the four types of coping strategies were combined to form a dichotomous response variable of strategy use vs. no strategy use. The reduction in the number

Table 25

Percentage of Subjects at Each Age Level Who Reported Using Each Type of Coping Strategy

	Coping Strategy					
Age (in years)	Happy Outcome	Not Real	Distraction	Other	None	N
5-7	8.0	3.4	12.5	8.0	68.1	88
9-11	26.5	12.3	4.1	6.1	51.0	98

Note. No subject reported using more than one type of coping strategy.

of response categories made it possible to include sex as a variable, which resulted in a five-way multidimensional contingency table. Analysis of this table again revealed a main effect of age level, $\underline{G}^2$ (1) = 5.29, p < .03, with coping strategies reported by more older subjects (49.0%) than younger subjects (31.8%). There was also a main effect of happy outcome information, $\underline{G}^2$ (1) = 4.15, p < .05, with strategy use reported more often by subjects who had been told about the happy outcome (48.4%) than by subjects who had not been told (33.3%). In addition, the interaction between age level and happy outcome information approached significance, $\underline{G}^2$ (1) = 3.30, p < .07. Among younger children, those who had heard about happy outcome were more likely to report using a coping strategy (45.5%) than were children who had not heard this information (18.2%). Among older subjects, there was virtually no difference in reports of strategy use by subjects in the two groups (prior knowledge, 51.0%; no prior knowledge, 46.9%). No other effects approached significance.[10]

Prediction of Outcome

It will be recalled that half of the subjects saw the entire program intact, and the remaining subjects gave their responses to the program before viewing the happy outcome. Subjects who had not yet seen the ending ($\underline{n}$ = 93) predicted what would happen next, and were then explicitly asked whether or not Fritz would escape from the snake.

Subjects' open-ended predictions were coded according to whether subjects expected a happy outcome or a sad outcome. Happy outcomes described by subjects included a successful escape by Fritz (e.g., "he'll kill the snake by choking it"), rescue by someone else (e.g., "the other two people will help him, and get him loose from the snake"), or the spontaneous departure of the snake (e.g., "the snake will get tired and leave"). Sad outcomes referred to serious injury and/or death (e.g., "he might get hurt or killed;" "maybe the snake will eat him;" "he's going to drown"). Most of the subjects (74.2%) predicted that the show would have a happy ending. Fifteen subjects (16.1%) expected a sad ending, and six subjects (6.5%) indicated that both types of outcomes were possible (e.g., "he's either going to get killed or the snake will die"). Three subjects (3.2%) were unable or unwilling to make a prediction and were excluded from further analysis.

Since the majority of responses predicted an exclusively happy outcome, reference to a potentially sad ending was considered the more important component of predictions that mentioned both types of outcomes. Thus, for purposes of statistical analysis, responses were classified as predicting either a happy outcome or a sad outcome, with any reference to a sad ending included in the latter category. A four-way multidimensional contingency table was constructed, using the variables Threat, Happy Outcome, Age Level, and Prediction, and a loglinear analysis was conducted on the cell frequencies. The variable of sex was excluded due to low frequencies in some cells. The analysis revealed a main effect of happy outcome, $\underline{G}^2$ (1) = 14.05, p < .001. As would be expected, subjects who had been told that the show would end happily were more likely to predict a happy outcome (93.3%) than were subjects who had not been told about the happy ending (60.0%). This finding confirms the effectiveness of the happy outcome manipulation. The analysis also revealed a main effect of age level, $\underline{G}^2$ (1) = 8.19, p < .005. Older subjects were more likely to predict a happy outcome (87.8%) than were younger subjects (63.4). None of the other effects reached significance. Despite the overall age difference, the happy outcome information apparently influenced the expectations of children in the two age groups equally.

All subjects responded to the forced-choice question regarding whether Fritz would escape from the snake. The results of a loglinear analysis of these data exactly paralleled the findings for subjects' open-ended predictions. As before, the analysis revealed a main effect of happy outcome, $\underline{G}^2$ (1) = 11.2, p < .001, and a main effect of age level, $\underline{G}^2$ (1) = 6.92, p < .01. Subjects were more likely to predict that Fritz would escape if they had been told about the happy ending (95.6%) than if they had not been told (66.0%), and escape was predicted more often by older subjects (91.8%) than by younger subjects (68.2%). There were no other significant effects.[11]

Control Variables

Four measures were obtained for possible use as control variables in analyses of self-reports of emotion: subjects' ratings of affect toward snakes and toward scary media presentations, frequency of exposure to scary programs, and parents' estimates of how many hours of television subjects typically viewed each day. These variables were selected because it seemed likely that they would mediate subjects' responses to the manipulations. Specifically, it was expected that subjects who particularly disliked snakes and/or scary programs might respond more strongly to the forewarning about a snake attack, and might be more motivated to utilize prior information about a happy outcome. It was also expected that greater familiarity with media presentations in general (indexed by hours of television viewing) or scary programs in particular might make subjects less likely to need prior information about the program events. In other words, subjects who have acquired a schema for understanding scary shows may be more likely to anticipate a threat and a happy outcome on their own.

For the affect measures (toward snakes and scary programs), subjects' ratings of liking or disliking were given the following codes: *dislike very very much* (1); *dislike very much* (2); *dislike pretty much* (3); *dislike a little bit* (4); *like a little bit* (6); *like pretty much* (7); *like very much* (8); *like very very much* (9). A neutral midpoint of (5) was assumed. Ratings of how often subjects viewed scary programs were coded as follows: *never* (0); *almost never* (1); *sometimes* (2); and *a lot* (3). Hours of television viewed per day were coded to the nearest half hour.

To determine if subjects' scores on these measures differed across conditions, each measure was subjected to an analysis of variance, with Threat, Happy Outcome, Age Level, and Sex as factors. For the measure of liking for snakes, there was a main effect of sex, $\underline{F}$ (1,170) = 25.03, p < .001, with greater liking expressed by boys ($\underline{M}$ = 5.5) than by girls ($\underline{M}$ = 3.5). No other effects were significant. Analysis of subjects' liking for scary media presentations revealed only a main effect of age level, $\underline{F}$ (1,170) = 15.19, p < .001, with greater liking reported by older subjects ($\underline{M}$ = 7.0) than by younger subjects ($\underline{M}$ = 5.4). Although the two liking measures were obtained after the experimental manipulations, these results suggest that the manipulations did not significantly affect subjects' evaluations of snakes or scary media offerings.

For frequency of exposure to scary programs, the analysis revealed a main effect of age level, $\underline{F}$ (1,170) = 5.35, p < .03, with younger subjects reporting less frequent exposure ($\underline{M}$ = 1.9) than older subjects ($\underline{M}$ = 2.2). There was also a three-way interaction among age level, sex, and threat forewarning, $\underline{F}$ (1,170) = 4.75, p < .04. Post hoc comparisons revealed that for younger girls, less frequent exposure to scary films was reported by subjects who had been forewarned ($\underline{M}$ = 1.6_a) than by those who had not been forewarned ($\underline{M}$ = 2.2_b). Threat forewarning was not related to frequency of exposure in the three other groups (younger boys, forewarned, $\underline{M}$ = 2.1_b, not forewarned, $\underline{M}$ = 1.9_{ab}; older girls, forewarned, $\underline{M}$ = 2.2_b, not forewarned, $\underline{M}$ = 2.3_b; older boys, forewarned, $\underline{M}$ = 2.0_b; not forewarned, $\underline{M}$ = 2.2_b). There does not seem to be any reason, however, that the threat forewarning would have led younger girls to report less frequent exposure to scary programs.

For hours of TV viewed per day, there was a main effect of age level, $\underline{F}$ (1,170) = 5.24, p < .03, with younger subjects reportedly viewing fewer hours of television per day ($\underline{M}$ = 2.5) than older subjects ($\underline{M}$ = 2.9). Inexplicably, there was also a main effect of threat forewarning, $\underline{F}$ (1,170) = 4.72, p < .04. Subjects who were forewarned about the threat averaged less television viewing time per day ($\underline{M}$ = 2.5) than did subjects who were not forewarned ($\underline{M}$ = 2.9). Because parents' reports were obtained prior to the study, the manipulation of forewarning could not have influenced subjects' viewing time. However, despite random assignment, television viewing time was not randomly distributed across conditions.

Zero-order correlations were calculated to provide an initial indication of the relationships among the potential covariates, and between these measures and subjects' reports of emotional response. The correlations are reported in Table 26. As can be seen from the table, many of the control variables were intercorrelated. Liking for scary shows was positively correlated with exposure to scary shows, liking for snakes, and television viewing time. Exposure to scary shows was also positively correlated with television viewing time. Two of the control variables were also related to self-reports of emotion. Liking for snakes was positively correlated with happiness during the playing scene, and negatively correlated with worry and with fear during the wading and attack scenes. For television viewing time, there was a marginally significant positive correlation with happiness during the homecoming scene. Liking for scary shows and frequency of exposure to scary shows were unrelated to self-reports of emotion.

The analysis of covariance is advantageous only when the covariates are related to the dependent variable within groups (Marascuilo & Levin, 1983). Furthermore, it is possible for a covariate to be related to a dependent variable within groups, but not across groups. Thus, a second set of analyses examined the relationship between the potential covariates and each dependent

Table 26

Zero-Order Correlations Between Self-Reports of Emotions and Control Variables

	Liking for Snakes	Liking for Scary Shows	Exposure to Scary Shows	Hours of TV per Day
Happiness Playing	.14*	.02	-.02	.06
Fear Sailing	-.02	.05	.03	.00
Fear Wading	-.13*	.06	.04	-.01
Fear Snake	-.14*	-.05	.03	-.03
Happiness Homecoming	-.03	-.08	-.01	.10@
Worry	-.19**	-.07	.09	.07
Liking for Snakes	--	.15*	.03	.03
Liking for Scary Shows		--	.51***	.15*
Exposure to Scary Shows			--	.10@
Hours of TV per Day				--

@ $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

Note. The N for all correlations is 186.

variable once the effects of the independent variables were removed. For each measure of emotional response, the independent variables (Threat, Happy Outcome, Age Level, Sex, and, for the analysis of happiness only, Ending) were entered in the first step of a multiple regression analysis, and the four covariates were entered in the second step. In the analysis of worry, the block of covariates produced a significant increase in R^2, $\underline{F}$ (4,177) = 3.00, p = .02. Two of the covariates were significant predictors of worry: liking for snakes, beta = -.17, $\underline{t}$ = -2.25, p < .03, and exposure to scary shows, beta = .16, $\underline{t}$ = 2.02, p < .05. In the analyses involving the other dependent variables, the increases in R^2 produced by the block of covariates did not approach significance. The beta weights for the individual covariates were nonsignificant as well, with two exceptions: liking for snakes was a significant predictor of happiness during the playing scene, beta = .16, t = 2.05, p < .05, and TV viewing time was a marginally significant predictor of happiness during the homecoming scene, beta = .13, t = 1.78, p < .08. Overall, these findings indicated that the analysis of covariance was potentially beneficial in the following cases: degree of happiness during the playing scene with liking for snakes as a covariate, degree of worry with liking for snakes and exposure to scary shows as covariates, and happiness during the homecoming scene with hours of TV viewing as a covariate. In the interest of caution, however, fear during the wading and snake scene were also reanalyzed with liking for snakes as a covariate.

Prior to running these analyses, the ANCOVA assumption of homogeneity of regression was tested. No group by covariate interactions were detected, indicating that the assumption was not violated. For happiness during the playing scene, fear during the wading and snake scenes, and degree of worry, 2 x 2 x 2 x 2 analyses of covariance were conducted, with Threat, Happy Outcome, Age Level, and Sex as factors. The same design was used to analyze happiness during the homecoming scene, with the exception that Ending was also included as a factor. The results of these analyses did not differ from the analyses of variance reported earlier, with the exception that the previously observed four way interaction in the analysis of worry was eliminated.

Supplementary Cognitive Measures

Scoring. The Mr. Cucumber test consists of six levels of difficulty (ranging from one to six dots to be remembered), with three trial at each level. The Opposites test consists of five levels of difficulty (ranging from one to five words in a list), with five trials at each level. A trial was scored as correct only if the subject's response was entirely correct. For the Mr. Cucumber test, a trial was correct if the subject recalled the locations of all of the dots on the picture. For the Opposites test, a trial was correct if the subject stated the opposites of all of the words in the list, in the correct order.

Case has employed the following scoring procedure for both tests. A subject is given one point for each level at which a majority of the trials have been scored as correct, and the points are summed (Case, 1985). Thus, for the Mr. Cucumber test, a majority was two trials correct (out of three) at a given level, and scores could range from 0 to 6. For the Opposites test, a majority was three trials correct (out of five) at a given level, and scores could range from 0 to 5. In the unlikely event that a subject failed to obtain a majority correct at one level, but did so at the next level of difficulty, he or she was awarded a point for both levels.

The Picture Arrangement test was scored according to the instructions provided by the Wechsler Intelligence Scale for Children - Revised (Wechsler, 1974). The scoring procedure took into account accuracy and speed. Scores could range from 0 to 48.

Descriptive analyses of subjects' scores. Table 27 shows that the three cognitive measures were highly intercorrelated, and were also highly correlated with age. All three measures remained significantly correlated when age was partialed out, although the magnitude of the correlations was substantially reduced ($\underline{r}$ between the Mr. Cucumber test and both other measures = .21, $p < .003$; $\underline{r}$ between the Opposites test and the Picture Arrangement test = .22, $p < .001$).

Table 27

Zero-Order Correlations Among Scores on the Cognitive Measures and Age

	Mr. Cucumber	Opposites	Picture Arrangement
Age	.62***	.60***	.70***
Mr. Cucumber	--	.50***	.55***
Opposites		--	.55***
Picture Arrangement			--

*** $p < .001$

Note. The $\underline{N}$ for all correlations is 186.

To examine the distribution of scores, each measure was analyzed in a 2 x 2 x 2 x 2 analysis of variance, with Threat, Happy Outcome, Age Level, and Sex as factors. For the Mr. Cucumber test, the analysis revealed a main effect of age level, $\underline{F}$ (1,170) = 80.89, p < .001, and an interaction between age level and sex, $\underline{F}$ (1,170) = 5.12, p < .03. Overall, younger subjects had lower scores ($\underline{M}$ = 2.1) than older subjects ($\underline{M}$ = 3.3). The interaction between age level and sex revealed that among younger subjects, boys scored higher ($\underline{M}$ = 2.4_b) than girls ($\underline{M}$ = 1.9_a), but there was no sex difference among older subjects (boys, $\underline{M}$ = 3.3_c; girls, $\underline{M}$ = 3.4_c). For the Opposites test, only a main effect of age level emerged, $\underline{F}$ (1,170) = 95.48, p < .001, with higher scores among older subjects ($\underline{M}$ = 3.3) than among younger subjects ($\underline{M}$ = 2.1). For the Picture Arrangement test also, the analysis revealed only a main effect of age level, $\underline{F}$ (1,170) = 119.80, p < .001, with higher scores among older subjects ($\underline{M}$ = 29.2) than among younger subjects ($\underline{M}$ = 16.9). These results show that, as expected, scores on all measures were higher among older subjects than among younger subjects, but were unaffected by the manipulation of prior information.

The degree of overlap between the two age groups on the three measures was also examined. Table 28 presents the percentages of subjects at each age level who obtained each score on the Mr. Cucumber test and the Opposites test. The table shows that there

Table 28

Distribution of Scores on the Tests of Working Memory Capacity as a Function of Age Level

MR. CUCUMBER TEST

Age (in years)	Score 1	2	3	4	5	6	N
5-7	22.7	47.7	26.2	3.4	0.0	0.0	88
9-11	0.0	19.4	43.8	24.5	9.2	3.1	98

OPPOSITES TEST

Age (in years)	Score 0	1	2	3	4	5	N
5-7	4.5	21.6	33.0	37.5	3.4	0.0	88
9-11	0.0	0.0	4.1	66.3	25.5	4.1	98

Note. Table values are the percentage of subjects at each age level who obtained each score.

is considerable overlap in scores across the two age groups. For the Picture Arrangement test, scores among younger subjects ranged from 2 to 37, with a median score of 18; scores among older subjects ranged from 8 to 44, with a median score of 30. More than three-fourths of the younger group obtained scores that were also obtained by older children.

Relationship between the cognitive measures and the effects of prior information on fear. The three tests of cognitive ability were included in the study to examine the relationship between children's working memory capacity and sequencing ability and the effects of prior information on fear responses. It was expected that subjects who scored higher on the three tests (indicating greater cognitive capacity and better sequencing skills) would be better able to utilize prior information about the program, especially knowledge of the happy outcome.

Based on the above reasoning, the following relationships were expected. Within the Control condition, there was no reason to expect an association between test scores and fear. Given a null relationship in the control condition, a positive relationship between test scores and fear was expected in the Threat forewarning condition. This pattern was expected because higher scorers should be better able to utilize the threat information, thus causing their fear to increase. In contrast, a negative relationship between test scores and fear was expected in the Happy Outcome condition, because higher scorers should be better able to utilize the reassuring information about the happy outcome. No specific predictions were made for the combined effects of the two manipulations in the Threat/Happy Outcome condition.

Initial analyses were conducted to determine whether scores on the cognitive measures were differentially related to fear responses within the four conditions. For each cognitive measure separately, analyses of variance were conducted on fear during the sailing, wading, and snake scenes, with Condition as an independent variable with four levels (control, threat, happy outcome, and threat/happy outcome), and the cognitive measure as a continuous independent variable (Marascuilo & Levin, 1983). With fear as the dependent variable, an interaction between condition and scores on one of the measures would indicate that such a relationship existed.

For fear during the sailing and wading scenes, no effects associated with any of the cognitive measures reached or approached significance. In contrast, for fear during the snake scene, the analysis involving scores on the Opposites test revealed an interaction between condition and test score that approached significance, $\underline{F}$ $(3,177) = 2.29$, $p = .08$. In addition, the analysis involving scores on the picture arrangement test revealed a significant interaction between condition and test score, $\underline{F}$ (3,177) = 3.40, p < .02. These results indicate that the relationship between fear during the snake scene and scores on the Opposites test and the Picture Arrangement test differ across the four conditions, although the effect for the Opposites test only approached significance. There were no significant effects for scores on the Mr. Cucumber test.

To examine the direction of the relationships within the four conditions, correlations were computed between scores on each test and degree of fear during the snake scene, with age partialed out. The partial correlations are presented in Table 29. Although the correlations were relatively low, the observed pattern for the Opposites test and the Picture Arrangement test was the opposite of the predicted pattern. In the Threat condition, the correlations between fear during the snake scene and test scores were negative, and in the Happy Outcome condition and the Threat/Happy Outcome condition, the correlations between fear and test scores were positive.

Overall, these relationships seem to suggest that the more poorly subjects performed on the Opposites test and the Picture Arrangement test, the more their fear responses during the snake scene were affected by the prior information. Specifically, the negative correlations in the Threat condition indicate that lower scores on the two tests were associated with higher fear; the positive correlations in the Happy Outcome and Threat/Happy

Table 29

Correlations Among Cognitive Measures and Ratings of Fear During the Snake Scene, Controlling for Age

	Condition			
Cognitive Measure	Control	Threat	Happy Outcome	Threat/ Happy Outcome
Mr. Cucumber	-.19	-.05	-.04	.01
Opposites	-.04	-.20@	.24@	.27*
Picture Arrangement	.06	-.35**	.28*	.21@
N	47	46	46	47

@ $p < .10$ * $p < .05$ ** $p < .01$

Outcome conditions indicate that lower scores on the two tests were associated with lower fear. These relationships would be produced if the threat forewarning tended to increase fear more among low scorers than among high scorers, and the happy outcome information tended to reduce fear more among low scorers than among high scorers.

One possible explanation for the results in the Threat condition is that subjects who scored high on tests of working memory capacity and sequencing ability may have tended to anticipate the threat on their own, independent of information provided in the introduction. Children who scored low on the two tests may have been less likely to "pick up on" threatening cues within the program. Thus, when an upcoming threat was explicitly described, low scorers may have been more strongly affected by the information than high scorers. A similar explanation can be advanced to account for the results in the conditions involving information about the happy outcome. High scorers may have been more likely than low scorers to expect a happy outcome or to keep such information in mind while viewing. Thus, explicitly mentioning a happy outcome may have benefited low scorers to a greater degree than high scorers. A second factor that may have contributed to the pattern of results in the Happy Outcome condition is that this introduction was interpreted by some subjects (mostly in the older group) as implying a threat. It seems likely that subjects who scored high on the tests of cognitive ability would have been more likely to make this inference. If so, the happy outcome introduction may have been less likely to reduce fear among these subjects, and may even have increased their fear.

To examine the validity of the above interpretations, children's responses on other measures were examined. First, within each condition, correlations were computed between a numerical measure of when subjects first began to worry and test scores, with age partialed out. The time when subjects began to worry was scored as follows: never worried (0); during the snake attack (1); after the snake appeared, but before the attack (2); before the snake appeared (3). Thus, higher scores indicate that subjects began worrying earlier in the show. None of the correlations between this measure and scores on the Opposites test approached significance (Control, $\underline{r} = -.07$; Threat, $\underline{r} = .02$; Happy Outcome, $\underline{r} = .18$; Threat/Happy Outcome, $\underline{r} = -.01$). For the Picture Arrangement test, there was a positive correlation in the Happy Outcome condition ($\underline{r} = .40$, $p < .001$), which indicates that the higher subjects scored on the test, the earlier in the program they began to worry. Correlations in the other conditions were negligible (Control, $\underline{r} = .10$; Threat, $\underline{r} = .07$; Threat/Happy Outcome, $\underline{r} = .06$). This finding is consistent with the possibility that in the Happy Outcome condition, high scorers in particular may have interpreted the information as implying a threat.

Predictions of the outcome by subjects who saw the interrupted version were also considered in relation to scores on the Opposites test and the Picture Arrangement test. Nearly all subjects who had been told about the happy outcome (95.6%) predicted that Fritz would escape. For the two remaining conditions (Control, n = 24; Threat, n = 23), point-biserial correlations were computed between subjects' prediction of the outcome (Fritz will escape = 1; Fritz will not escape = 0) and test scores, with age partialed out. For the Opposites test, the correlations were negligible (Control, r = .00; Threat, r = -.07). For the Picture Arrangement test, the correlation was virtually zero in the Threat condition (r = .01), but a strong positive correlation was observed in the Control condition (r = .55, p < .001). In other words, in the Control condition, high scorers on the Picture Arrangement test were more likely than low scorers to expect a happy ending. Because nearly all subjects who were told about the happy outcome predicted that Fritz would escape, this finding provides some evidence that the happy outcome information had a greater effect on low scorers than on high scorers, who already expected a happy ending. The reason for the difference between the Control and Threat conditions is not immediately obvious, but it may be that high scorers interpreted the threat forewarning as suggesting a tragic outcome, and thus were less likely to predict that Fritz would escape.

Finally, subjects' use of coping strategies was considered. It was not obvious how the use of coping strategies should be related to fear responses. One possibility was that coping strategies would reduce fear, and therefore the use of coping strategies should be associated with less fear. On the other hand, if the experience of fear motivates subjects to implement coping strategies in the first place, then the use of strategies may be associated with greater fear. In any case, when point-biserial correlations were computed for each condition between the use of a coping strategy (yes vs. no) and test scores, with age partialed out, none of the correlations reached significance.

To summarize, scores on a verbal measure of working memory capacity (the Opposites test) and a test that taps sequencing ability (the Picture Arrangement test) were related to fear during the snake scene. Specifically, scores on both tests were unrelated to fear in the Control condition, negatively related to fear in the Threat condition, and positively related to fear in the Happy Outcome and Threat/Happy Outcome conditions. This pattern of results was the opposite of the predicted pattern. Subjects' responses to other measures provided some support for the proposed explanation that low scorers were more strongly affected by the manipulations than high scorers because low scorers were less likely to generate the information in the introductions on their own. However, many variables undoubtedly interact to determine how subjects will respond to prior information, and thus the present conclusions are tentative at best.

Suspense and Enjoyment

A secondary purpose of the present study was to examine the factors that best predict children's enjoyment of a suspenseful program. In particular, the study was concerned with how suspense and concern about a threatened character were related to liking for a program when the threat was either resolved or not resolved. In addition, the relationship between liking and physiological arousal during the frightening scene was examined.

Two measures directly assessed subjects' enjoyment: liking for the ending of the show and liking for the show overall. Subjects' degree of liking or disliking was coded in the same way as degree of liking for snakes and scary media presentations reported earlier. Scores could range from (1), dislike very very much, to (9), like very very much. Initial analyses of variance were conducted to determine the effect of the independent variables on liking. Next, regression analyses were conducted to identify the best predictors of the liking measures. The variables that were used as predictors include three manipulated variables (threat, happy outcome, timing of the ending), and three measured variables that were expected to contribute to liking and enjoyment (worry, perceived danger, and liking for Fritz). The study by Jose and Brewer (1984) used worry as an indicator of suspense. All analyses of variance reported in this section are 2 x 2 x 2 x 2 x 2 ANOVAs, with Threat, Happy Outcome, Age Level, Sex, and Ending as factors.

Liking for the ending. It will be recalled that the "ending" subjects were asked to evaluate varied according to whether they saw the intact or interrupted version of the program. For those who viewed the intact program, the ending depicted the successful resolution of the threat. For those who viewed the interrupted version, the program ended abruptly as Fritz was struggling with the snake. Nearly all of the subjects who saw the intact version (98.9%) reported that they liked the ending. Reports of liking were less frequent for the ending of the interrupted version; 44.1% of the subjects who saw this program said that they liked the ending. Younger and older subjects did not differ on this measure: 43.1% and 44.9%, respectively, liked the unresolved ending.

As expected, the analysis of variance of the ratings revealed a main effect of the ending, $\underline{F}$ (1,154) = 90.25, $p < .001$, with greater liking for the ending of the intact version ($\underline{M}$ = 8.0) than for the ending of the interrupted version ($\underline{M}$ = 5.3). There was also a main effect of age level, $\underline{F}$ (1,154) = 3.93, $p < .05$.

Overall, younger subjects liked the ending more ($\underline{M}$ = 6.9) than did older subjects ($\underline{M}$ = 6.4). The analysis also revealed a Sex x Ending interaction, $\underline{F}$ (1,154) = 4.13, p < .05. The difference in liking for the two endings was greater among girls (mean difference = 3.3_b; intact, $\underline{M}$ = 8.2, interrupted, $\underline{M}$ = 4.9) than among boys (mean difference = 2.1_a; intact, $\underline{M}$ = 7.8, interrupted, $\underline{M}$ = 5.7). Finally, there was a Threat x Happy Outcome x Ending interaction, $\underline{F}$ (1,154) = 3.96, p < .05. The pattern of means did not seem to be interpretable, however, and pairwise comparisons revealed no significant differences. No other effects emerged in this analysis.

Liking for the program. Nearly all subjects (96.8%) said that they liked the program overall. The fact that so many subjects liked the program with the unresolved ending is consistent with evidence that many aspects of suspenseful programs are enjoyable, including action and excitement, independent of whether the threat is successfully resolved (Tamborini & Stiff, 1987).

The ANOVA on subjects' degree of liking revealed a main effect of the happy outcome, $\underline{F}$ (1,154) = 4.84, p < .03. Subjects who had prior knowledge that the program would end happily liked the program less ($\underline{M}$ = 7.6) than did subjects who had no prior knowledge about the outcome ($\underline{M}$ = 8.0). There was also a main effect of age level, $\underline{F}$ (1,154) = 10.76, p = .001, with younger subjects reporting a greater degree of liking ($\underline{M}$ = 8.1) than older subjects ($\underline{M}$ = 7.5). No other effects reached or approached significance.

Relationship between the two measures of liking. The relationship between liking for the ending and for the program among subjects who saw the two versions provides some evidence that the resolution is not a major determinant of liking for the program overall. For subjects who saw the intact version, liking for the program was positively related to liking for the ending, although the correlation only approached significance ($\underline{r}$ = .19, $p < .05$, controlling for age). In contrast, for subjects who saw the interrupted version, the two measures of liking were uncorrelated ($\underline{r}$ = .00, controlling for age).

Relationship between liking and positive affect in response to the homecoming scene. To evaluate the validity of subjects' ratings of liking, the relationships between these measures and other indicators of positive affect were examined. These measures were smiling during the homecoming scene and self-reports of happiness during the homecoming scene. Correlations among these measures and subjects' liking for the ending and the program, controlling for age, are reported in Table 30. Subjects who saw the intact and interrupted versions are considered separately because their liking judgments were based on programs with different endings. The intact version concluded with the homecoming scene, whereas the interrupted version ended during

Table 30

Correlations Among Liking and Positive Affect in Response to the Homecoming Scene, Controlling for Age

INTACT VERSION

	Liking for Ending	Liking for Program
EJ Homecoming	.27**	-.08
Happiness Homecoming	.38***	.13

INTERRUPTED VERSION

	Liking for Ending	Liking for Program
EJ Homecoming	-.20*	-.12
Happiness Homecoming	-.12	.16@

@ p < .10   * p < .05   ** p < .01   *** p < .001

Note. For the intact version, $\underline{n}$ = 93, and for the interrupted version, $\underline{n}$ = 91.

the snake scene (and subjects rated their degree of liking before they saw the homecoming scene).

For the intact version, liking for the ending was positively correlated with smiling and happiness during the homecoming scene. In contrast, for the interrupted version, these correlations were negative, although only the correlation with smiling during the homecoming scene was significant. This pattern of results supports the validity of the liking measure. Among subjects who rated their liking for the ending after seeing the homecoming scene, liking was positively related to the other indicators of enjoyment. Among subjects who rated their liking for the unresolved ending, those who reported less liking tended to enjoy the homecoming scene more when they were finally given the opportunity to view it. Liking for the program was not significantly related to either indicator of positive affect during the homecoming scene. However, there was a marginally significant positive correlation between happiness and liking for the program among subjects who saw the interrupted version.

Relationship between liking and physiological arousal. To determine whether subjects' liking for the ending and the program were related to the degree of arousal they experienced during the frightening scene, partial correlations were computed between ratings of liking and physiological responses (skin temperature and heart rate) during the wading/snake scene, controlling for base level physiological response and age. Table 31 shows that many of the correlations were low. However, for the interrupted version, there were two negative correlations that lead to contradictory conclusions. The marginally significant correlation with skin temperature suggests that higher arousal (i.e., lower skin temperature) was associated with greater liking for the unresolved ending. This is clearly counterintuitive, since there is no reason to expect that an *unsuccessful* resolution would be liked better by more highly aroused subjects. In contrast, the significant correlation with heart rate suggests that lower arousal (i.e., lower heart rate) was associated with greater liking for the program overall. This finding could be interpreted as indicating that subjects who were more aroused (and perhaps experienced more negative affect) enjoyed the unresolved program less. However, because the results are contradictory, no strong conclusions can be made.

For subjects who saw the intact version, correlations were also computed between liking and physiological responses during the homecoming scene. These correlations were negligible (ranging from .00 to -.03).

Measured predictors. Three variables were measured with the expectation that they would predict subjects' enjoyment of the program. Degree of worry about Fritz and perceived dangerousness of the snake used a common numerical scale: (0), *not at all*

Table 31

Correlations Between Liking and Skin Temperature and Heart Rate During the Snake Scene, Controlling for Base Level Physiological Response and Age

INTACT VERSION

	Liking for Ending	Liking for Program	N
Skin Temperature	.01	.01	87
Heart Rate	-.03	.04	87

INTERRUPTED VERSION

	Liking for Ending	Liking for Program	N
Skin Temperature	-.17●	.02	93
Heart Rate	.04	-.19*	82

● $p < .10$ * $p < .05$

worried/dangerous, (1), *a little bit* worried/dangerous, (2), *pretty* worried/dangerous, (3), *very* worried/dangerous, and (4), *very very* worried/dangerous. Liking for Fritz used the same scale as was used for other measures of liking, and ranged from (1), dislike very very much, to (9), like very very much.

Initial analyses of variance were conducted on these variables. The analysis of worry, reported earlier, revealed only a main effect of age level, with more worry among younger subjects. The analysis of liking for Fritz revealed a main effect of age level, $\underline{F}$ (1,154) = 3.77, p = .054. Younger subjects liked Fritz more ($\underline{M}$ = 7.4) than did older subjects ($\underline{M}$ = 7.0). There was also a four-way interaction among threat, age level, sex, and ending, $\underline{F}$ (1,154) = 5.2, p < .03. None of the post hoc comparisons were significant, however, and the pattern of means was not readily interpretable. For ratings of the dangerousness of the snake, there was also a main effect of age level, $\underline{F}$ (1,154) = 8.64, p < .005, with greater danger perceived by younger subjects ($\underline{M}$ = 3.7) than by older subjects ($\underline{M}$ = 3.4). There was also an interaction between threat and happy outcome, $\underline{F}$ (1,154) = 6.50, p < .02, although none of the post hoc comparisons were significant (control, $\underline{M}$ = 3.6; threat, $\underline{M}$ = 3.4; happy outcome, $\underline{M}$ = 3.4; threat/happy outcome, $\underline{M}$ = 3.8). Finally, there was an interaction among age level, sex, and ending, $\underline{F}$ (1,154) = 6.85, p < .02. Post hoc comparisons revealed that the age difference reported about (greater danger perceived by younger subjects) was significant only among boys who saw the intact version.

Correlations among variables. The zero-order correlations among variables are presented in Table 32. In general, older subjects reported lower levels of emotional response and less liking than younger subjects. Sex of the subject was unrelated to any of the measures, with the exception of a marginally significant tendency for more worry among girls than boys. The three measured predictors (worry, perceived danger, liking for Fritz) were positively correlated with each other and with liking for the program. Prior knowledge of the happy outcome was also correlated with liking for the program, with less liking associated with prior knowledge. Timing of the ending was the only predictor that was correlated with liking for the ending.

To determine whether any of the three measured predictors (worry, danger, liking for Fritz) mediated the observed relationship between happy outcome and liking for the show, or between timing of the ending and liking for the ending, partial correlations were calculated. The effect of each potential mediator was partialed separately and then the effects of all three were removed simultaneously. In all cases, the partial correlations were as strong as the zero-order correlations. This indicates that the manipulated variables affected liking independent of worry, perceived danger, and liking for Fritz.

Table 32

Zero-Order Correlations Among the Predictor Variables and the Ratings of Liking

	SEX	FRITZ	WORRY	DANGER	THREAT	HAPPY	END	LIKEEND	LIKESHOW
AGE	-.04	-.15*	-.29***	-.23***	-.01	-.01	.02	-.12*	-.29***
SEX	--	-.01	.11@	.07	-.01	-.01	.01	-.04	.01
FRITZ		--	.35***	.19**	.04	.02	-.02	-.02	.34***
WORRY			--	.42***	-.08	-.01	.12*	.09	.36***
DANGER				--	.06	.02	-.10@	.09	.24***
THREAT					--	.01	.01	-.01	-.08
HAPPY						--	.01	-.01	-.16*
END							--	.58***	-.02
LIKEEND								--	.07
LIKESHOW									--

@ $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

Note. The N for all correlations is 186. The variables abbreviated in the table are as follows: AGE = age in months; SEX = child's sex, male (1), female (2); FRITZ = liking for Fritz; WORRY = degree of worry about Fritz; DANGER = perceived danger; THREAT = threat forewarning, no (0), yes (1); HAPPY = prior knowledge of the happy outcome, no (0), yes (1); END = timing of the ending, delayed (0), continuous (1); LIKEEND = liking for the ending; LIKESHOW = liking for the show.

Prediction of subjects' enjoyment. Although it had been expected that the three measured variables would mediate the effects of the manipulated variables, this did not prove to be the case. Thus, there was no reason to perform a path analysis. Next, multiple regression was used to identify the variables that best predict children's liking for the ending and liking for the program. A separate regression analysis was conducted for each of these two dependent variables. In each analysis, age and sex were entered in the first step, the three measured predictor variables (worry, perceived danger, liking for Fritz) were entered as a set in the second step, and the three manipulated variables (threat, happy outcome, timing of ending) were entered together in the last step. By using this order of entry, the second step in the equation reveals the relationship between liking and specific responses to program content, once age and sex have been removed; the third step reveals the effect of the manipulations on liking, once all of the other variables have been removed.

The first analysis examined children's liking for the ending of the program, which stopped either after the snake scene or after the happy outcome. The results of this analysis are summarized in Table 33. Once age and sex were removed, the set of measured predictor variables accounted for virtually no variance in liking for the ending. The manipulated variables, in contrast, accounted for a significant portion of the variance.

Table 33

Summary of Regression Analysis on Liking for the Ending -- Entire Sample

Variable	beta	t	R^2 adj	R^2 change	F change
Age	-.12	-1.93 @	.01	.02	1.50
Sex	-.05	-.89			
Like Fritz	-.04	-.56	.00	.01	.58
Worry	-.07	-.92			
Danger	.15	2.29 *			
Threat	-.03	-.54	.35	.35	32.87 ***
Happy Outcome	-.02	-.29			
Ending	.60	9.93 ***			

N = 186 @ $p < .10$ * $p < .05$ *** $p < .001$

Note. Age and Sex were entered into the equation first as a set. Next, the set of three measured predictor variables (Liking for Fritz, Worry, and Perceived Danger) was entered. Finally, the manipulated variables (Threat, Happy Outcome, and Timing of the Ending) were added to the equation. The beta values and associated t values were obtained in the final step of the analysis.

R^2 change = .35, F (3,177) = 32.87, $p < .001$. The positive beta weight for timing of the ending indicates that, not surprisingly, subjects liked the ending better when the program concluded with the happy outcome than when the program was interrupted following the attack scene. Neither threat nor happy outcome predicted liking for the ending. Once the manipulated variables were entered in the equation, however, the beta weight for perceived danger became significant. In other words, when subjects' experimental condition was controlled, the relationship between perceived danger and liking emerged. The positive coefficient for danger shows that as perception of danger increased, liking for the ending also increased.

The analysis of subjects' liking for the overall program is summarized in Table 34. In this analysis, the measured predictor variables accounted for a significant proportion of variance once the effects of age and sex were removed, R^2 change = .13, F (3,180) = 10.11, $p < .001$. The additional variance accounted for by the set of manipulated variables was also significant, R^2 change = .04, F (3,177) = 2.84, $p < .05$. Beta weights for three of the predictor variables reached significance: liking for Fritz, worry, and happy outcome. The positive coefficients for the first two variables indicate that as liking for and worry about Fritz increased, liking for the program also increased. The negative coefficient for happy outcome indicates that subjects liked the

Table 34

Summary of Regression Analysis on Liking for the Program -- Entire Sample

Variable	beta	t	R^2 adj	R^2 change	F change
Age	-.18	-2.69 **	.07	.08	8.39 ***
Sex	-.03	-.42			
Like Fritz	.23	3.35 ***	.19	.13	10.11 ***
Worry	.18	2.32 *			
Danger	.08	1.10			
Threat	-.08	-1.25	.22	.04	2.84 *
Happy Outcome	-.17	-2.59 **			
Ending	-.02	-.35			

N = 186   * $p < .05$ ** $p < .01$ *** $p < .001$

Note. Age and Sex were entered into the equation first as a set. Next, the set of three measured predictor variables (Liking for Fritz, Worry, and Perceived Danger) was entered. Finally, the manipulated variables (Threat, Happy Outcome, and Timing of the Ending) were added to the equation. The Beta values and associated t values were obtained in the final step of the analysis.

program better when they had not been informed beforehand about the happy outcome. The beta weights for the remaining variables were negligible.

The regression analyses reported above identify the best predictors of liking across the entire data set. However, it was expected that different patterns of responses would emerge for the intact and interrupted versions, and that responses to the two versions may differ for younger and older children. To examine age differences in responses to the programs with resolved and unresolved endings, interaction terms involving these two variables (age group, program version) and the predictor variables could be entered in a multiple regression analysis. This did not seem to be a feasible approach, however, given the large number of variables involved. Furthermore, it seemed that the differences would emerge more clearly if four separate regression analyses were conducted. Thus, four analyses were run, two involving subjects who reported on their responses after viewing the happy resolution (younger, $\underline{n}$ = 44; older, $\underline{n}$ = 49), and two involving subjects who did so after viewing the unresolved ending (younger, $\underline{n}$ = 44; older, $\underline{n}$ = 49). Because the $\underline{n}$s for these analyses were relatively low, sex was excluded from the analyses. In any case, in the analyses involving the entire sample, sex accounted for very little variance in liking.

The analyses of liking for the ending in the intact and interrupted versions of the program are summarized in Table 35 (younger subjects) and Table 36 (older subjects). It will be recalled that timing of the ending was the only manipulated variable that predicted liking for the ending in the entire data set. When responses to the intact and interrupted versions were examined separately, the set of manipulated variables (threat and happy outcome) did not predict liking for the ending once the effects of the other variables were removed. However, some effects did emerge for the measured predictors. Among younger subjects who saw the intact version, a significant portion of variance was accounted for by the set of measured predictors, $R^2 = .29$, $F\ (3,40) = 5.42$, $p < .01$. Worry was the only variable that was a significant predictor of liking for the happy ending. The positive coefficient indicates that as worry increased, liking for the ending also increased. Among younger subjects who saw the interrupted version, the measured predictors as a set did not account for a significant proportion of variance in liking for the unresolved ending. However, an examination of the beta weights for the individual variables shows that worry was a significant predictor. The negative coefficient indicates that, as expected, increased worry was associated with decreased liking. In other words, worry enhanced liking for the ending that successfully resolved the threat (positive beta for the intact version), but tended to reduce liking for the ending that left the threat

Table 35

Summary of Regression Analysis on Liking for the Ending for Each Program Version Separately -- Younger Subjects

INTACT VERSION

Variable	beta	t	R^2 adj	R^2 change	F change
Like Fritz	-.04	-.23	.26	.29	5.42 **
Worry	.54	3.23 **			
Danger	.03	.19			
Threat	.00	.01	.20	.00	.00
Happy Outcome	.01	.03			

INTERRUPTED VERSION

Variable	beta	t	R^2 adj	R^2 change	F change
Like Fritz	-.01	-.07	.03	.10	1.52
Worry	-.35	-2.10 *			
Danger	.05	.33			
Threat	-.12	-.76	.03	.04	.84
Happy Outcome	-.16	-1.03			

* $p < .05$ ** $p < .01$

Note. The n for both analyses is 44. The set of measured predictor variables (Liking for Fritz, Worry, and Perceived Danger) was entered first. Then the two manipulated variables (Threat, Happy Outcome) were added to the equation. The beta values and associated t values were obtained in the second step of the analysis.

Table 36

Summary of Regression Analysis on Liking for the Ending for Each Program Version Separately -- Older Subjects

INTACT VERSION

Variable	beta	_t_	R^2 adj	R^2 change	_F_ change
Like Fritz	-.15	-1.09	.22	.27	5.61 **
Worry	.15	.80			
Danger	.44	2.45 *			
Threat	-.09	-.72	.20	.01	.29
Happy Outcome	.03	-.25			

INTERRUPTED VERSION

Variable	beta	_t_	R^2 adj	R^2 change	_F_ change
Like Fritz	-.11	-.69	-.05	.02	.31
Worry	.01	.05			
Danger	.13	.79			
Threat	.06	.42	-.08	.01	.78
Happy Outcome	.08	.55			

* $p < .05$ ** $p < .01$

Note. The _n_ for both analyses is 49. The set of measured predictor variables (Liking for Fritz, Worry, and Perceived Danger) was entered first. Then the two manipulated variables (Threat, Happy Outcome) were added to the equation. The beta values and associated _t_ values were obtained in the second step of the analysis.

unresolved (negative beta for the interrupted version).

Among older subjects who saw the intact version, a significant portion of variance in liking for the ending was accounted for by the set of measured predictors, $R^2 = .27$, $F(3,45) = 5.61$, $p < .01$. Perceived danger was the only significant predictor, and the positive coefficient showed that as perceived danger increased, liking for the happy ending increased. None of the variables predicted older subjects' liking for the unresolved ending (interrupted version).

The separate analyses of subjects' liking for the two versions of the program are summarized in Table 37 (younger subjects) and Table 38 (older subjects). Again, the set of manipulated variables did not account for a significant amount of variance in any of the analyses. Among younger subjects, the set of measured predictors also failed to account for a significant proportion of variance in liking for either program version. However, when the beta weights associated with individual variables were examined, worry was a marginally significant predictor of liking for the intact version of the program. Once again, the positive beta shows that worry tended to enhance liking for the program. For the interrupted version, happy outcome information was a marginally significant predictor of liking, with less liking associated with prior knowledge. It seems likely that subjects who had been told that the show would end happily were

Table 37

Summary of Regression Analysis on Liking for the Program for Each Program Version Separately -- Younger Subjects

INTACT VERSION

Variable	beta	t	R^2 adj	R^2 change	F change
Like Fritz	-.03	-.18	.04	.11	1.60
Worry	.35	1.91 @			
Danger	-.02	-.13			
Threat	.06	.40	.00	.01	.13
Happy Outcome	-.05	-.32			

INTERRUPTED VERSION

Variable	beta	t	R^2 adj	R^2 change	F change
Like Fritz	.09	.57	.04	.10	1.53
Worry	.26	1.64			
Danger	-.04	-.27			
Threat	-.10	-.63	.08	.08	1.97
Happy Outcome	-.28	-1.86 @			

@ $p < .10$

Note. The n for both analyses is 44. The set of measured predictor variables (Liking for Fritz, Worry, and Perceived Danger) was entered first. Then the two manipulated variables (Threat, Happy Outcome) were added to the equation. The beta values and associated t values were obtained in the second step of the analysis.

Table 38

Summary of Regression Analysis on Liking for the Program for Each Program Version Separately -- Older Subjects

INTACT VERSION

Variable	beta	$\underline{t}$	R^2 adj	R^2 change	$\underline{F}$ change
Like Fritz	.58	4.76 ***	.37	.41	10.42 ***
Worry	-.01	-.08			
Danger	.14	.93			
Threat	-.12	-1.07	.40	.05	2.07
Happy Outcome	-.20	-1.71 @			

INTERRUPTED VERSION

Variable	beta	$\underline{t}$	R^2 adj	R^2 change	$\underline{F}$ change
Like Fritz	.12	.79	.17	.22	4.18 **
Worry	.27	1.84 @			
Danger	.28	1.96 @			
Threat	-.16	-1.18	.15	.02	.71
Happy Outcome	.03	.22			

@ $p < .10$ ** $p < .01$ *** $p < .001$

Note. The $\underline{n}$ for both analyses is 49. The set of measured predictor variables (Liking for Fritz, Worry, and Perceived Danger) was entered first. Then the two manipulated variables (Threat, Happy Outcome) were added to the equation. The beta values and associated $\underline{t}$ values were obtained in the second step of the analysis.

disappointed that the threat was not successfully resolved.

Among older subjects, the set of measured predictors accounted for a significant proportion of variance in liking for both program versions [intact version, R^2 = .41, $\underline{F}$ (3,45) = 10.42, $p < .001$; interrupted version, R^2 = .22, $\underline{F}$ (3,45) = 4.18, $p < .01$]. For the intact version, liking for Fritz was the only significant predictor. The positive beta indicates that the greater subjects' liking for Fritz, the greater their liking for the happily resolved program. Although the manipulated variables as a set did not account for a significant proportion of variance, the beta weight for happy outcome approached significance, with knowledge of the happy outcome associated with less liking. This finding is consistent with the expectation that knowledge of the happy outcome would reduce suspense and hence reduce liking for the program. Although subjects' degree of worry was not reduced by knowledge of the happy ending (in the ANOVA reported above), it may still be the case that knowing the outcome ahead of time tended to reduce feelings of anticipation and interest. For the interrupted version, the beta weights for worry and perceived danger approached significance. The positive coefficients indicate that as worry and perceived danger increased, liking for the program increased. Apparently subjects enjoyed the suspenseful and dangerous aspects of the narrative, even though the threat was not successfully resolved. These results provide evidence that enjoyment of suspense and danger may partially account for the finding, reported above, that many subjects who saw the interrupted version liked the program.

To summarize, among younger subjects, worry was positively related to liking for the happy ending, and negatively related to liking for the unresolved ending. Apparently, the more worry younger subjects felt for the character, the more they enjoyed seeing him escape harm, but the less they enjoyed seeing him struggle unsuccessfully. Among older subjects, perceived danger was associated with greater liking for the happy ending, but none of the variables predicted liking for the unresolved ending. The perception of danger seemed to enhance enjoyment of a successful resolution, but not enjoyment of an unsuccessful resolution. It is unclear why worry did not predict liking for the ending among older subjects. Contrary to expectations, liking for Fritz did not predict liking for the ending in either age group.

A different pattern of results was observed for liking of the program overall. Worry tended to enhance younger subjects' liking for the happily resolved program, whereas worry and danger tended to enhance older subjects' liking for the unresolved program. It is unclear why worry and danger did not enhance older subjects' liking for the happily resolved program as well. However, the data suggest that enjoyment of suspense and danger for their own sake (i.e., without an effective resolution) develops with age.

Perhaps younger children enjoy frightening programs only when they are successfully resolved, whereas older subjects enjoy the exciting depiction of danger and destruction, even if the program ends unhappily. Unexpectedly, liking for Fritz was the only variable that significantly predicted older subjects' liking for the happily resolved program. This relationship cannot be due to increased enjoyment of the happy ending itself, since liking for the happy ending was unrelated to liking for Fritz. Enjoyment of the program overall may have been more strongly affected by subjects' responses to other scenes, since nearly two thirds of the program depicts Fritz and his brother in activities unrelated to the threat.

Finally, prior knowledge of the happy outcome differentially affected liking for the program in the two age groups. Among older subjects, prior knowledge of the happy outcome tended to reduce liking for the happily resolved program. Although knowing about the happy outcome did not cause a reduction in worry, it may have reduced feelings of anticipation or interest, and therefore may have made the program less enjoyable. Knowledge of the happy outcome may have reduced the interest value of the unresolved program as well, but in addition, it may have helped the older subjects to anticipate a happy ending. Among younger subjects, knowledge of the happy outcome had no effect on liking for the happily resolved program. This finding supports the expectation that younger subjects would be less likely than older subjects to keep the happy outcome information in mind while viewing. However, knowledge of the happy outcome tended to reduce younger subjects' liking for the unresolved program, perhaps because the outcome violated their expectations.

CHAPTER SEVEN

Discussion

Summary and Interpretation of the Results

The results of this study provided support for the expectation that forewarning of a threat would increase anticipatory fear and worry among children. Some support emerged for the predicted fear-reducing effects of prior knowledge of a happy outcome, but the effect was not robust. The pattern of results for self-report and physiological indicators of emotional response were consistent, but the manipulations had little effect on facial expressions. In general, information about the threat and the happy outcome did not interact. Unexpectedly, the two types of prior information affected the emotional responses of both age groups in similar ways.

Threat forewarning. The hypothesis that forewarning of a threat would increase, rather than reduce, fear was supported by self-reports and physiological responses. Forewarned subjects were more likely to report feelings of fear or anxiety during the wading scene, and to begin worrying about the threatened character earlier in the program. No effects of the forewarning were observed on self-reports during the snake scene. Thus, the forewarning increased anticipatory fear and worry, but didn't influence fear responses to the frightening scene itself.

Forewarning appeared to counteract a general trend toward increasing skin temperature during the experimental session. Subjects who were not forewarned showed a rise in skin temperature over time (indicating relaxation), whereas forewarned subjects showed a slight decrease. The skin temperature data also showed that subjects who had been forewarned were more aroused during the frightening scene, although the latency of skin temperature suggests that this finding may reflect responses earlier in the program. The effect of forewarning on heart rate was much weaker, and emerged only among subjects who saw the intact version of the program. For these subjects, forewarning was associated with higher heart rate early in the program, and a smaller decrease in heart rate during the homecoming scene. Although this effect only approached significance, the pattern of the results was consistent with both self reports of emotion and changes in skin temperature.

These findings are generally consistent with the effects of forewarning that Cantor et al. (1984) observed with adults, and indicate that the conclusions of their study can be extended to children. Some inconsistency may appear to exist between the results of the two studies, however, because Cantor et al. reported differences in fright during scary scenes, whereas differences in the present study emerged only during the anticipation period. However, it appears that the adults rated their responses to scenes that were several minutes in length, and that undoubtedly included periods of anticipation as well as the depiction of frightening events. It may be that the higher levels of fear reported by forewarned subjects in that study were primarily a function of anticipating the scary events. The fact that Cantor et al. found the strongest effect for heart rate "just before" the final attack supports this hypothesis.

As noted above, the threat forewarning did not affect subjects' responses to the frightening scene itself. Other research has found that warning about an upcoming threat has the strongest impact on emotional responses during the anticipatory period (e.g., Lazarus & Alfert, 1964; Nomikos et al., 1968). One reason that forewarning of the threat influenced anticipatory responses, but not responses during the scary scene, may be that different processes operate to arouse fear in the two situations. Anticipatory feelings of fear or anxiety are based primarily on thoughts and expectations about upcoming harm, whereas fear responses to a threatening event itself may be aroused by the depiction of the threat and immediate evidence of harm (Lazarus & Averill, 1972). For example, during a scary scene, viewers may respond directly to perceptual aspects of the threatening stimulus or to the emotional expressions of the threatened characters (Cantor, in press-a; Hoffman, 1984). Thus, prior to the appearance of the threat, verbal information may have led subjects to appraise ambigucus cues as threatening (e.g., the dark environment during the wading scene), thereby increasing anticipatory fear. The impact of the snake scene, however, may have overwhelmed any buildup of negative arousal carried over from the preceding scene.

Forewarning of the threat also tended to reduce subjects' reports of positive affect and happiness during the homecoming scene, but these effects were qualified by interactions. For positive affect, the effect was significant only for younger subjects; degree of happiness was reduced by forewarning only among girls who saw the intact version of the program. Both skin temperature and heart rate showed that forewarning was associated with less relaxation during the homecoming scene. These findings seem contrary to Zillmann's notion that fear-induced arousal should intensify enjoyment. Other studies have shown that greater suspense is associated with more enjoyment of a happy resolution (see Zillmann, 1980), and one of these studies involved children (Zillmann et al., 1975). However, Zillmann et al. (1975) did not assess the children's fear responses, and the animated film used in their study may not have produced genuine fear. It seems likely that for children, a truly negative emotional state may be difficult to overcome quickly (Barden et al., 1985). Although forewarning of the attack increased physiological arousal, it may also have led subjects to dwell on the threatening event, thus making the cognitive switch from negative to positive thoughts more difficult.

Consistent with the idea that a cognitive switch from negative to positive was not automatic for children is the finding that subjects who saw the intact version of the program reported less happiness and smiled less during the homecoming scene than those who saw the ending after a delay. Furthermore, among subjects who saw the intact version only, skin temperature during the wading/snake scene and the homecoming scene was positively related to happiness during the homecoming scene, indicating that the more aroused subjects were less happy. When the happy ending immediately followed the frightening snake scene, subjects may have found it harder to shift their thoughts from the snake attack to the happy ending. In contrast, the time that intervened between these scenes for subjects who saw the interrupted version may have given subjects time to "recover."

Prior knowledge of the happy outcome. The present study provided some support for the hypothesis that prior knowledge about a happy outcome would reduce feelings of fear during the program. Knowledge of the happy outcome tended to reduce reports of fear during the wading scene. During the snake scene, happy outcome information tended to decrease open-ended reports of fear among older subjects, but actually tended to increase such reports among younger subjects. Although none of the comparisons was significant, the pattern of results among younger subjects is difficult to explain. Prior knowledge of the happy outcome also reduced degree of fear during the snake scene among girls but not boys. Overall, girls reported a higher level of fear, and information about the happy outcome reduced their fear to the boys' level.

The expected effects of the happy outcome information also emerged in the skin temperature data. Subjects who knew about the happy outcome showed an increase in skin temperature over time (indicating relaxation), whereas subjects who did not know about the happy outcome showed no change over time. Knowledge of the happy outcome was also associated with higher skin temperature during the snake scene. Heart rate, however, did not differentiate subjects who knew vs. did not know how the program would be resolved.

The fact that knowledge of the happy outcome did not have a strong effect on fear during the wading scene is not really surprising, since this scene involved no immediately obvious threat and viewers were unsure of exactly what would transpire. During the attack scene, however, knowledge of the happy outcome could have been used by subjects to reassure themselves that the character would escape unharmed. The expected reduction in fear during the snake scene emerged within different subgroups on the two self-report measures. The lack of consistency across measures makes it difficult to draw a firm conclusion about the effect of the happy outcome information.

There are several possible reasons that the information about the happy outcome did not have a stronger or more consistent effect on emotional responses during the frightening scene. First, viewers may simply have been emotionally overwhelmed by the depicted events. Cantor (in press-a) noted that even viewers who are attempting to control or reduce their emotional responses may be "caught off guard" by "a particularly arresting" depiction. In the experimental film, the snake grabbed the boy rather suddenly, and was much larger than the typical snake. In addition, the boy appeared very distressed as he struggled with the snake. Children who were upset by this depiction may have found it hard to recall and apply the information about the happy ending. Evidence indicates that arousing, negative emotional states such as fear and anxiety have the effect of narrowing attentional focus and interfering with utilization of cues that are peripheral to the central focus of attention (Baddeley, 1972; Easterbrook, 1959; Hamilton, 1980; Mandler, 1979). Hamilton (1980), for example, argues that the aversive content of anxious thoughts interferes with performance on information processing tasks by "overloading" short-term working memory. Reappraisal of a threatening situation should involve considerable cognitive effort (Cantor & Wilson, 1988;

Lazarus & Folkman, 1984), and even the older subjects may have had difficulty focusing on the eventual positive outcome.

Second, the snake scene was very involving, in the sense that the attack was an engrossing and suspenseful situation. Even when adult viewers are fully aware that the main characters in television series will not die or be seriously injured, viewers seem to become absorbed in the plot and feel genuine concern for the characters. Dorr, Doubleday, and Kovaric (1983), for example, argue that "enjoyment of drama is often predicated on the willing suspension of disbelief" (p. 122). Furthermore, Zillmann (1980) points out that even when the ultimate outcome of a program is not in doubt, viewers usually do not know how each subplot will progress. Thus, even if viewers know that a certain character will ultimately be safe, they may worry that the character will suffer in the meantime.

This possibility suggests a third reason that the happy outcome information was not more effective. Not enough information may have been provided to effectively assure viewers that the protagonist would be completely unharmed. Despite asserting that the program would end happily and that the characters would be safe, the introduction was vague with regard to how this turn of events would be accomplished. The viewer still had much uncertainty about when and how the threatened boy would escape from the snake. This vagueness was required by the factorial design of the study, since it was necessary to avoid referring directly to a threat in the happy-outcome-only condition. However, it seems likely that the happy outcome introduction might have been more effective in reducing fear and worry if the information had been more explicit (e.g., by specifying when and how the boy would be rescued). Other researchers, however, have pointed out that even very specific information about a successful outcome may not be able to entirely eliminate concern about a severely threatened character (Brewer & Lichtenstein, 1981; Comisky & Bryant, 1982).

Lack of age differences in the effects of prior information. The expected age differences in the effects of the two types of prior information failed to emerge in this study. Forewarning of the threatening event influenced fear, worry, and physiological arousal, independent of age level. Although a stronger effect of the forewarning had been expected among older subjects, the research on anticipation and on the use of prior knowledge had suggested that even the younger subjects would respond to the forewarning. The present data suggest that anticipating the occurrence of a novel, verbally-presented threat was within the ability of children in both age groups.

Age differences had also been expected in use of the happy outcome information. Theory and research on the development of working memory capacity and understanding of temporal order suggested that younger children would have considerable difficulty utilizing knowledge of the happy outcome to reduce their fear. The age difference on one measure of emotional response (open-ended fear during the snake scene) was generally consistent with the prediction that older children would benefit more from knowledge of the happy outcome, but this finding was not observed on any other item.

The measures of cognitive ability provided little insight into the cognitive processes underlying the effects of prior information. At most, the findings for these measures suggest that low scorers were more affected by prior information about the threat and the happy outcome, possibly because they were less likely to recognize or generate the information themselves. This pattern of results suggests that knowledge may have been a more important factor in the use of prior information than ability, although the lack of age differences is still surprising. It may be that children's motivation to control their fear responses, and their preferred methods of coping, are stronger determinants of the use of prior information than either knowledge or ability (cf. Sparks & Spirek, in press; Tamborini et al., 1987). In other words, stronger effects of prior information, especially about the happy outcome, may have emerged if children's preferred methods of coping had been taken into account. Of course, the effective use of prior information to reduce fear requires both ability and motivation. Thus, future research should include measures of ability in conjunction with the assessment of coping preferences (Miller, 1987). This approach may be more fruitful in identifying the circumstances in which prior information can be an effective fear-reduction strategy.

Overall age differences in responses to the program. Age differences in responses to the program, independent of prior information, provide some insight into how children of different ages interpret suspenseful shows. First, older subjects reported worrying about the threatened character earlier in the program than did younger subjects. This finding suggests that older children may be more sensitive than younger children to the danger cues in suspenseful programs. Cues that can enhance suspense include the context in which events occur and formal features such as pacing, editing, or music (Nomikos et al., 1968; Norden, 1980). Children's understanding of the plot implications of formal features develops with age and experience (Huston & Wright, 1983). The music in the experimental film undoubtedly contributed to the emotional responses of all children (Dorr et al., 1983; Himmelweit et al., 1958). However, it seems likely that children also gradually learn the significance of different types of music.

Furthermore, the structure of a narrative is especially important in developing suspense (Brewer & Lichtenstein, 1981).

Older children are generally more sensitive to the structure of media presentations (Collins et al., 1978), and have greater experience with a variety of media genres, such as mysteries or police dramas. Knowledge of media formats should help children anticipate events and outcomes (Collins, 1981; Himmelweit et al., 1958). Specifically, if older children are more familiar with the general structure of suspense or adventure films, then they should be more likely to expect typical events to occur (cf. Slackman & Nelson, 1984). For example, characters who venture into unknown territory on their own (as the boys in the experimental film did) typically encounter some type of danger. The finding that older children were more likely than younger children to expect a happy outcome is consistent with this view. As one 11-year-old said: "I've seen that kind of show, and the stars don't get hurt or killed." Although neither television viewing time nor self-reported frequency of exposure to scary films was related to fear, age may have been a better indicator of children's knowledge of formal features and familiarity with the structure of suspenseful films.

Overall, younger children reported feeling more frightened than older children. The lower level of fear among older children may have been due, in part, to a reluctance to admit to feeling scared. Older subjects also may have been more likely to employ "adult discount," which has been defined as the tendency to maintain a psychological distance from the events (Dysinger & Ruckmick, 1933; Freidson, 1953). Psychological distance may result from focusing on the unreality of the content or the fictional status of the program (Dorr et al., 1983). Freidson (1953) also attributed the development of "adult discount" to children's increasing familiarity with the typical structure of certain genres (e.g., westerns), particularly the inevitable triumph of the "good guys" over the villains. This interpretation is supported by the fact that older subjects in the present study were more likely to expect a happy ending. Although Dorr et al. (1983) contend that viewers rarely move outside of the perspective of the program (i.e., they rarely employ "adult discount"), they may do so as a way of coping with fear. In fact, one-fourth of the subjects in the present study reported using coping strategies that involved thinking about the happy ending or the unreality of the program, and older subjects were more likely to do this than younger subjects.

Relationships among measures of emotion. In general, there was very little relationship among the multiple measures of emotion: self-reports, facial expressions, and physiological responses (skin temperature and heart rate). Other studies of emotional reactions to media presentations have also found low correlations among multiple measures of emotion (e.g., Cantor, Zillmann, & Day, 1978).

The various systems of emotional response (including subjective, facial, and physiological) may show parallel responses to emotion-inducing stimuli, but there are many factors that may lead to desynchrony among the systems (Crabbs & Hopper, 1980; Lazarus, 1967; Schwartz, 1982). One factor may be the level of emotional response. Synchrony among measures is more likely to occur for intense emotions than for mild emotions (Hodgson & Rachman, 1974). According to Lang (1977, 1984), the different response systems vary in their sensitivity to stimuli. Mild emotional states may be detectable only through verbal report, whereas physiological responses and visible facial expressions seem to be associated with stronger emotional reactions. Although the contractions of particular facial muscles are reliably associated with specific emotions, these contractions are often not visible and can be measured only by electromyography (Schwartz, 1982). Studies using films that evoked stronger negative responses from viewers have found higher correlations among multiple indicators of emotional response (Cantor & Hoffner, 1987; Wilson, 1987).

A variety of individual differences in emotional responsiveness may also contribute to low correlations across systems. Individual differences in self-perception of arousal (Katkin, 1985) or in use of coping strategies (Schwartz, 1982) may lead to a lack of relationship between self-reports and physiological indicators of emotion. There is also some evidence that people who are facially expressive are less physiologically reactive, and vice versa (Buck, 1980).

Finally, the various components of emotional response also serve homeostatic and communicative functions, and thus may operate independently under some circumstances (Buck, 1980; Derryberry & Rothbart, 1984; Izard, 1977).

Coping strategies. The data on children's use of coping strategies revealed some interesting findings. Approximately half of the subjects reported that they used some type of coping strategy during the scary scene. The three most commonly mentioned strategies were thinking about a happy ending, thinking about the unreality of the program, and thinking about unrelated (usually happy) topics. Thinking about the happy ending was more common among children who heard this information beforehand (23%) than among those who did not (13%), but this difference was not significant. These data indicate that this strategy was used spontaneously by a substantial minority of children. Prior knowledge of the happy outcome, however, did significantly increase the number of younger subjects who used some type of coping strategy. Strategy information may have been needed more by younger children, who generally have less knowledge about how to cope with scary programs. It is not clear why happy outcome information would have promoted the use of other types of strategies as well. It may be that, while viewing, the younger children recalled the positive nature of the information, but not the specific content of the message. Alternatively, they may have had difficulty recalling or describing what they thought about while viewing, and may therefore have reporting thinking "happy thoughts" when they actually thought about the happy outcome.

Because the happy outcome information promoted the use of coping strategies, especially among younger children, it seems that this information should have been more effective in reducing fear. However, an examination of the relationship between strategy use and degree of fear during the snake scene revealed that the two were unrelated (point biserial $\underline{r}$ = -.01). The fact that subjects who reported using a coping strategy did not have lower fear is not surprising if the reciprocal relationship between fear and coping is considered more closely (Lazarus, 1975; Lazarus & Folkman, 1984). Coping strategies, if applied effectively, should reduce the experienced level of fear or anxiety. However, the motivation underlying the use of coping processes is generally a desire to regulate an aversive emotional state. In the present study, children who did not consider the program frightening would have had no reason to use any type of coping strategy. Thus, even if the coping strategies children reported using were effective, they may have succeeded only in lowering fear to the level of children who were less frightened in the first place. Furthermore, the fact that children used some type of strategy does not mean that they did so successfully.

Age differences were observed in the types of strategies children reported using. Thinking about the happy ending or the unreality of the program were the strategies reported most frequently by older children, whereas cognitive distraction was mentioned most often by younger children. These findings are consistent with evidence that thinking or talking about a frightening stimulus is more effective in reducing fear among older children (Cantor & Wilson, 1988). However, even the strategies reported by younger children involved some type of cognitive component. The apparent preference for cognitive strategies at both age levels may be partially a function of the experimental situation, in which most noncognitive strategies (e.g., physical comfort, eating or drinking) were unavailable. It would useful to obtain children's reports of the strategies they actually use in their homes or in theatres.

Enjoyment of the program. With regard to the investigation of enjoyment, it should be noted that the data do not present a clear, consistent pattern regarding the predictors of children's liking for suspenseful programs. The source of difficulty may lie in the relatively small number of subjects involved in each analysis. The present study was not primarily concerned with examining children's enjoyment of suspenseful programs, however. Future research, designed specifically for this purpose, should include larger numbers of subjects. This would be feasible with a simpler research design.

Several results of the analyses of suspense and enjoyment deserve further comment. In contrast to the theory and findings of researchers working with adults (e.g., Brewer & Lichtenstein, 1981, 1982; Comisky & Bryant, 1982), children's degree of suspense (indexed as degree of worry) was not influenced by prior information about the threat or happy outcome. Information about the happy outcome, in particular, has been shown to reduce suspense among adults, using both written narratives and films as stimuli. Again, the lack of an effect in the present study may be due to ambiguity in the message regarding how the happy ending would be accomplished. Thus, the present findings should not be interpreted as indicating that suspense among children is not influenced by degree of prior information.

The fact that children liked both the resolved and unresolved programs indicates that factors other than a successful resolution contribute to enjoyment. However, the variables measured in the present study were not strong predictors of liking for the program with the unresolved ending. Consistent with research on responses to horror films (Sparks, 1986a; Tamborini & Stiff, 1987), action or excitement may be more important determinants of enjoyment among children than suspense or perceived danger. In fact, Sparks (1986b) reported that the most common reasons children cited for liking scary programs were the excitement and novelty of such presentations. These variables should be included in controlled research, to determine their relative contribution to enjoyment among children.

Implications

The present research has several theoretical and practical implications. First, Lazarus' theory provided a useful framework for generating predictions about the process by which prior information may influence responses to a mediated threat. Although no direct evidence was obtained of subjects' interpretations of threat-related cues, the effects of the threat forewarning suggest that this information probably influenced appraisals of ambiguous cues during the scenes preceding the threatening event. The marginal effect of happy outcome information on fear during the anticipation period is consistent with this interpretation. The data clearly show that verbal information can influence anticipatory emotions among children as young as five years of age.

Information about how children's interpretations of suspenseful media presentations change with age was also obtained. The older children appeared to be more sensitive to narrative cues and to have a better grasp of the typical structure of suspense programs, at least those frequently viewed by children. These findings confirm previous conclusions about children's understanding of media presentations, which were derived using different program formats and other types of manipulations (e.g., Collins, 1981).

Subjects' reports of their coping strategies provided some initial evidence regarding how children attempt to regulate their fear responses to a scary program. Although one study examined children's perceptions of the effectiveness of various coping strategies (Wilson et al., 1987), it appears that no previous studies obtained children's reports of the strategies they use while viewing specific programs. Unfortunately, there is no indication of the effectiveness of the strategies children reported using in the present study. Even their own perceptions would be of interest, especially given the complex relationship between coping and fear.

The present findings have practical implications regarding the coping strategies that are likely to be effective in reducing children's fear responses. The data indicate that forewarning of a threatening event is not an effective fear reduction strategy, even though it may lead to accurate expectations about a threat. The effectiveness of prior knowledge of a happy outcome received limited support. Given the fact that the information provided about the happy outcome was vague, and could have been presented more explicitly, the present findings are encouraging. It seems likely that more detailed information could be helpful in reducing fear, especially if the utility of the information is pointed out to viewers. One drawback associated with prior knowledge of the happy outcome was that this information reduced children's liking for the program. If children recognize that knowing about the ending reduces their enjoyment, they may be reluctant to hear about the outcome before viewing.

Future Research

The present study was an initial investigation of the effects of prior information on children's emotional responses to a frightening media presentation. The results as well as the limitations of this research suggest many areas for further study.

First, the conclusions regarding the effects of the threat forewarning should not be generalized too broadly without additional research. There may be circumstances in which information about a threat is helpful in reducing fear. People often know that the events in a film or television program they are about to see are going to be scary. In this situation, fear may be reduced by information designed to minimize the threatening nature of the events. For example, information about the techniques used to produce special effects may serve to make the events seem less realistic (Dorr, 1983). In addition, knowledge of the timing of scary events may allow viewers to better prepare themselves emotionally for potentially disturbing scenes, although such information would be difficult to convey effectively. Some viewers may be able to enjoy most aspects of frightening films, as long as they are able to avoid exposure to the more intense or visually disturbing depictions. Knowing when a scary scene is coming up could facilitate performance of well-timed avoidance behaviors, such as looking away from the screen. This type of information would be most useful for programs in which disturbing scenes occur without warning.

The effect of prior information, especially concerning the threat, may depend partially on the unique structure and content of the scary program. In the present study, practical considerations required the use of only one media stimulus. Although the program that was used seems reasonably representative of suspenseful presentations, frightening programs may vary on many dimensions, including the nature of the threat and the degree of surprise involved. Future research should use different types of media stimuli, in order to determine the generalizability of the present conclusions.

Regarding knowledge of a happy outcome, several suggestions can be made about how to proceed in future research. First, the context of the present study may have limited the effectiveness of the happy outcome information. Specifically, it seems likely that the information would be more effective in reducing fear if presented interpersonally by someone the child knows and trusts. It may also be that statements regarding an eventual happy outcome will be more helpful if provided by a coviewer during scary sequences, rather than before the program. This approach would avoid the problem of recalling the happy outcome information during an emotionally arousing scene. Research could examine these possibilities in several ways. Interviews with parents and children could help identify the circumstances in which various coping strategies, including knowledge of a happy outcome, are usually effective. The relationship between the methods parents use to help their children and the strategies children report using on their own may provide information about how children develop a repertoire of coping strategies. In addition, experimental or observational studies could examine the effectiveness of happy outcome information provided at different times during a scary program by parents, siblings, or friends (cf. Haefner & Wartella, 1987; Messaris & Sarett, 1981).

Another research approach would be to examine the effect of specific instructions to keep the happy outcome information in mind while viewing (cf. Cantor & Wilson, 1984). The present data indicate that younger children are less likely to expect a threatening sequence to end happily, and less likely to report thinking about a happy outcome as a way of reducing their fear responses. Yet even older children may not consistently use their expectations of a happy ending to modify their fear responses. Children may be more likely to benefit from knowledge of a happy outcome if the fear-reducing potential of this information is explicitly pointed out to them.

Individual differences in coping preferences and cognitive style also need to be considered more closely in future research. The effectiveness of prior information about a happy resolution should depend in part on whether the viewer seeks out the information and/or is motivated to use it. Some viewers apparently enjoy the thrill of witnessing violent, brutal depictions, and undoubtedly would not want to modify their emotional responses to such presentations. Other viewers prefer not to experience high levels of arousal associated with certain types of scary scenes, but may still want to watch the programs. For this type of individual, prior information may allow them to enjoy programs they would otherwise avoid. Although the present results were not altered by taking into account subjects' liking for and exposure to scary films, these measures may be relatively poor indicators of more fundamental individual differences. One research approach to this question could involve dividing subjects on the basis of their typical methods for coping with stress (Miller, 1987) or their preference for highly stimulating activities (Zuckerman, 1979). Prior knowledge about a happy outcome may be more effective for children who prefer to minimize the threatening nature of stimuli, or who generally avoid excessive stimulation (cf. Sparks, 1986a; Sparks & Spirek, in press). The finding that knowledge of a happy outcome tended to reduce children's enjoyment of the program suggests that some children may prefer not to know how a scary program is resolved.

A potentially effective program of intervention would identify children who wanted to gain control over their fear responses (in contrast to children who enjoy feeling frightened), and then assist them in developing and implementing self-initiated coping strategies. For most television series, for example, it is safe to assume that the main characters will emerge relatively unscathed from whatever threats they encounter.

Finally, as suggested above, future research should examine the effects of more specific information about a happy outcome. Providing greater detail may enhance children's ability to connect the information to the threatening scene as it transpires. More specific information may also be more reassuring in that viewers would know that the threatened character would not suffer and would sustain no serious injury. Providing detailed information about the outcome is a less practical option for parents, however, since they may not know exactly how a threatening event will be resolved.

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NOTES

[1]Ridgeway, Waters, and Kuczaj (1985) collected normative data on children's understanding of emotion labels between the ages of 18 months and 6 years. They report that by the age of 5.5 to 6 years, 100% of children know the meaning of the words happy, sad, and scared, and 86.7% know the meaning of the word worried (which was used later in the session).

To obtain an approximately equal-interval scale, a series of potential modifiers for emotion labels was pretested with adults. On the questionnaire, the modifiers were paired with the emotion "scared," but the instructions noted that the same modifiers could also be used with other emotions. The modifiers were rated on a 9-point scale (0 = least scared, 8 = most scared) by 33 undergraduates enrolled in a communications course at the University of Wisconsin. The phrases that received mean ratings closest to the ideal values of 0, 2, 4, 6, and 8 were selected: "not at all scared" (M = 0.0), "a little bit scared" (M = 1.8), "pretty scared" (M = 4.6), "very scared" (M = 6.2), and "very very scared" (M = 7.5). For these five phrases, the mean correlation between subjects' ratings and the ideal ratings was .97, with r values ranging from .92 to 1.00.

[2]Figures 1, 2, and 3 were adapted from the fear rating scale in Sparks and Cantor (1986). The face used on the scale was

altered to appear more androgynous, and the happy and sad facial expressions were drawn for the present study.

[3]The loglinear method does not treat any variable as a dependent variable. However, since the response variables are dependent on the other variables in this study, only interactions involving a response variable and at least one other variable are meaningful. For example, an interaction between recall accuracy and an independent variable is analogous to a main effect of that independent variable in an analysis of variance. To simplify the discussion, effects are referred to in the more familiar analysis of variance terminology (Kennedy, 1983; Marascuilo & Levin, 1983). Because some of the cell frequencies were low, a constant of .5 was added to each cell before analysis. This reduces the likelihood ratio chi-square test by increasing the expected cell frequencies, and therefore makes the test more conservative (Brown, 1983).

The measure of partial association is calculated by pooling separate chi-squares, whereas marginal association is calculated by collapsing across variables not involved in a particular effect. Partial association is reported here because this measure is not affected by unequal sample sizes. However, in all loglinear analyses in the present study, both measures of association led to the same statistical decisions.

[4]Although the timing of the ending was related only to

hypotheses about responses to the homecoming scene, preliminary analyses of emotion ratings for the other scenes included timing of the ending as a factor. The ending factor was associated with significant effects in only one analysis: the ANOVA conducted on ratings of fear during the snake scene. This analysis revealed a main effect of the ending variable, with higher levels of fear reported by subjects who had already seen the ending of the program. The ending variable did not interact with other variables. Thus, since the inclusion of the ending variable complicated an already complex design, it was not included in the analyses of fear and worry reported here.

[5]The sphericity assumption for repeated-measures ANOVA is an assumption about the form of the variance-covariance matrix. Compound symmetry (equal variances and equal covariances) is sufficient to meet this assumption. However, the sphericity assumption is less restrictive; it requires that the variances of differences for all pairs of treatment levels are homogeneous (Kirk, 1982). This assumption is often violated when the repeated factor involves time (Keppel, 1973), because the covariance of the means tends to decrease across time periods, independent of the variance of the individual means (e.g., the mean of a variable at time 1 would tend to be more highly correlated with the mean at time 2 than with the mean at time 3). If the sphericity assumption is not met, the $\underline{F}$ test will be positively biased.

However, the Geisser-Greenhouse correction can be used to produce an unbiased $\underline{F}$ test. This correction reduces the degrees of freedom used to test the significance of the $\underline{F}$ statistic, thereby making the test more conservative.

[6]When self-reports of emotion were reanalyzed after eliminating subjects who had seen the experimental film, most of the previously-observed effects were replicated. The few differences between the two sets of analyses are reported below.

For degree of fear during the wading scene, neither the main effect of happy outcome (which approached significance when all subjects were included) nor the four-way interaction reached or approached significance. For degree of fear during the snake scene, the interaction between sex and happy outcome did not approach significance.

For open-ended reports of positive affect during the homecoming scene, both the main effect of age level and the interaction between age level and threat forewarning approached significance ($p < .10$ for both). For ratings of happiness during the homecoming scene, the elimination of subjects resulted in one empty cell, so the variable of sex was excluded from the reanalysis. Under these circumstances, the main effect of timing of the ending was no longer significant ($p < .12$). Due to the elimination of sex from the analysis, it was impossible to observe the three-way interactions involving this variable.

[7]Subjects' facial expressions were reanalyzed, eliminating subjects who had previously seen the experimental film. In the loglinear analyses of the presence vs. absence of emotion expressions, no effects reached or approached significance.

For duration of enjoyment during the wading/snake scene, the main effect of threat forewarning no longer approached significance. For enjoyment during the homecoming scene, the interaction between age level and the happy ending approached significance, $\underline{F}$ (1,121) = 2.66, p = .106, but the main effects of happy outcome and timing of the ending did not.

[8]The physiological data were also analyzed using seven 30-s segments for the initial portion of the program, and two 30-s segments for the homecoming scene. The pattern of results for these analyses paralleled those obtained using 60-s segments.

[9]Physiological responses were reanalyzed, eliminating subjects who reported that they had seen the experimental film before. For the skin temperature analysis involving only subjects who saw the intact version, and for both heart rate analyses, the elimination of subjects who previously saw the experimental film (in addition to the loss of subjects due to equipment failure) resulted in very small $\underline{n}$s in a few cells. To overcome this problem, these analyses were run with sex excluded as a factor.

For the reanalysis of skin temperature over three time periods, the main effect of time approached significance, $\underline{F}$

(2,250) = 2.63, $p < .10$. The previously observed Time x Threat and Time x Happy Outcome interactions did not approach significance. In the reanalysis of skin temperature over four time periods, the elimination of sex as a variable made it impossible to observe the interaction between age level and sex. However, the analysis revealed a main effect of age level, F (1,56) = 4.76, $p < .04$. Neither the main effect of time nor the Time x Threat interaction approached significance.

For heart rate, the reanalysis involving three time periods completely replicated previous results, with the exception that the main effect of sex could not be observed. In the analysis of heart rate over four time periods, neither the main effect of time nor the Time x Threat interaction approached significance. The four-way interaction involving sex could not be observed.

[10]For coping strategies, the reanalyses eliminating subjects who had seen the movie before differed in only one way from the original analyses. When the categories were collapsed to form a dichotomous response variable (strategy use vs. no strategy use), the main effect of age level was no longer significant ($p < .12$).

[11]For both open-ended and closed-ended predictions, elimination of subjects who had seen the show before had no effect on the findings.

APPENDIX A

Introductions

Control

In the next program, Fritz and his younger brother Ernest live on an island with their parents. The show is about some of the things the boys do together, like swimming, wading, and going boating. Sometimes their friend Trina goes along.

Threat

In the next program, Fritz and his younger brother Ernest live on an island with their parents. The show is about some of the things the boys do together, like swimming, wading, and going boating. Sometimes their friend Trina goes along.

In one of the scenes you'll see, a really big snake comes up out of the water and attacks Fritz. The snake wraps itself tighter and tighter around Fritz and drags him down under the water. He can't breathe, and no one is close enough to help him.

Happy Outcome

In the next program, Fritz and his younger brother Ernest live on an island with their parents. The show is about some of the things the boys do together, like swimming, wading, and going boating. Sometimes their friend Trina goes along.

In one of the scenes you'll see, Ernest helps Fritz, and both boys get out of the water safely. They both know a lot about how to take care of themselves in the outdoors, so everyone is OK. Soon they're at home with their parents, safe and sound.

Threat/Happy Outcome

In the next program, Fritz and his younger brother Ernest live on an island with their parents. The show is about some of the things the boys do together, like swimming, wading, and going boating. Sometimes their friend Trina goes along.

In one of the scenes you'll see, a really big snake comes up out of the water and attacks Fritz. The snake wraps itself tighter and tighter around Fritz and drags him down under the water. He can't breathe, and no one is close enough to help him.

But after a minute, Ernest helps Fritz, and both boys get out of the water safely. They both know a lot about how to take care of themselves in the outdoors, so everyone is OK. Soon they're at home with their parents, safe and sound.

APPENDIX B

Parental Permission Form

Date

Dear Parent:

I am writing to request your permission for your child to participate in a study of children's reactions to television. The study is part of a long-term research program regarding child development and the mass media. The results of the study should contribute to our scientific knowledge of children's reactions to television and the role parents can play in the child's process of growing up with television.

The study will involve showing your child a series of short videotaped segments, most of which appeared on television recently. The segments may include the following: nature scenes, segments about farming and rural life in Wisconsin, and sequences from action-adventure movies. Children who participate in this study will watch the videotapes, and we'll ask them about their impressions of what they saw. We are interested in how their body's reactions relate to what they say about their feelings, so while they are viewing the tapes we will monitor their skin temperature and heart rate (via their finger). This procedure will not be uncomfortable in any way - we simply attach small sensors to their fingers using velcro strips. In addition, we will videotape your child's facial reactions while viewing the videotape. This will provide additional information on your child's responses to the films. The videotapes will be stored by us for future analysis by our research group. We will also administer short questionnaires assessing memory and opinions. The entire session will last approximately 45 minutes, and will be held during regular school hours.

We encourage you to preview the videotapes and look at the physiological equipment at your child's school in [room], on [date] at [time]. At that time, we will be glad to answer any further questions you may have about the study. Also you may call me or Cynthia Hoffner, at 262-2543, if you have any questions.

Prior to running the study, we will give all the children a demonstration of how we measure their reactions. Your child may withdraw from the study at any time. Your child's responses will of course be confidential. There will be no specific benefits to your child as a result of participating in the study, except that the experience should be an enjoyable and educational one. Of course, there are no risks involved.

If you would like your child to participate in this study, please sign one copy of this letter (keep the other), and return it to us in the enclosed envelope by [date]. Thank you very much for considering your child's participation in this project.

Sincerely,

Joanne Cantor
Professor

I have read the above and give my consent for my child to participate in this study.

______________________	______________________	________
Child's name (printed)	Parent's signature	Date
______________________	____________	
Child's date of birth	Classroom #	

Approximately how many hours a day does your child watch TV? ____

APPENDIX C

Content of the Experimental Videotape

Segment	*Time (min:sec)*	
1. Nature in Wisconsin	0:47	
black screen		0:05
2. Farming and a visit to a farmers' market	1:41	
black screen		0:05
3. Scenes of nature	0:50	
4. Audio manipulation		
a. Control		
black screen		0:49
Control introduction	0:16	
b. Threat		
black screen		0:32
Threat introduction	0:33	
c. Happy Outcome		
black screen		0:32
Happy Outcome introduction	0:33	
d. Threat/Happy Outcome		
black screen		0:15
Threat/Happy Outcome introduction	0:50	
5. Pause for recall (black screen)		0:40
6. Experimental film	4:50	
Entire videotape	10:03	

APPENDIX D

Form Used to Obtain Self-Reports of Responses to the Experimental Program -- Interrupted Version

After nature scenes:

Now you're going to hear a short introduction about the next program. I recorded the introduction myself, because I wanted you to know what the next program is about. Listen carefully so you can remember what is going to happen on the show.

After the introduction:

What did the introduction just say would happen in the program? Anything else?

____ Fritz is attacked by a big snake

Spontaneous (1)   Reminded (2)   N.A. (9)

____ Ernest helps Fritz/boys are safe at home by end of show

Spontaneous (1)   Reminded (2)   N.A. (9)

After program:

____ 1a. How did you feel just now when the show ended, and Fritz was fighting the snake? (Show photos)

____

____ 1b. Did you feel happy, sad, scared, or just OK? (board A)

happy (1)   sad (2)   scared (3)   just OK (4)

____ 1c. How ________ did you feel? Did you feel:

a little bit	pretty	very	very very	[just OK]
(1)	(2)	(3)	(4)	(0)

____ 2a. Now think back to the beginning of the program. How did you feel during this scene, when the boys were playing in the waterfall? (Show photos)

____

____ 2b. Did you feel happy, sad, scared, or just OK? (board A)

happy (1) sad (2) scared (3) just OK (4)

____ 2c. How _________ did you feel? Did you feel:

a little bit	pretty	very	very very	[just OK]
(1)	(2)	(3)	(4)	(0)

____ 3a. How did you feel during this scene, when the boys were sailing in their boat? (Show photos)

____

____ 3b. Did you feel happy, sad, scared, or just OK? (board A)

happy (1) sad (2) scared (3) just OK (4)

____ 3c. How _________ did you feel? Did you feel:

a little bit	pretty	very	very very	[just OK]
(1)	(2)	(3)	(4)	(0)

____ 4a. How did you feel during this scene, when the boys were first wading in the river? (Show photos)

____

____ 4b. Did you feel happy, sad, scared, or just OK? (board A)

happy (1) sad (2) scared (3) just OK (4)

____ 4c. How _________ did you feel? Did you feel:

a little bit	pretty	very	very very	[just OK]
(1)	(2)	(3)	(4)	(0)

____ 5. (not asked for this version)

____ 6. How did you like the way the program ended? Did you like the ending or did you dislike the ending?

like dislike

How much did you like/dislike the way the program ended?

like it a little bit (6)	like it pretty much (7)	like it very much (8)	like it very very much (9)
dislike it a little bit (4)	dislike it pretty much (3)	dislike it very much (2)	dislike it very very much (1)

____ 7. How did you like the program overall? Did you like it or did you dislike it?

like dislike

How much did you like/dislike the way the program ended?

like it a little bit (6)	like it pretty much (7)	like it very much (8)	like it very very much (9)
dislike it a little bit (4)	dislike it pretty much (3)	dislike it very much (2)	dislike it very very much (1)

____ 8. How did you feel about Fritz? (Show photo) Did you like him or did you dislike him?

like dislike

How much did you like/dislike Fritz?

like him a little bit (6)	like him pretty much (7)	like him very much (8)	like him very very much (9)
dislike him a little bit (4)	dislike him pretty much (3)	dislike him very much (2)	dislike him very very much (1)

_____ 9a. When Fritz was fighting the snake, how worried were you about whether he would be OK?

not at all worried	a little bit worried	pretty worried	very worried	very very worried
(0)	(1)	(2)	(3)	(4)

_____ 10. [If worried, show series of photos:] These are pictures from the TV show, starting at the very beginning of the show. In this picture...

(1) Fritz and Ernest are playing in the waterfall.

(2) The boys are leaving in their boat.

(3) The boys are sailing on the ocean.

(4) The boys are first wading in the river.

(5) The snake comes up out of the water.

(6) Fritz is fighting the snake.

Point to the picture that shows the scene where you first started to worry about Fritz.

Picture # (1) (2) (3) (4) (5) (6)

_____ 11. How dangerous do you think the snake was?

not at all dangerous	a little bit dangerous	pretty dangerous	very dangerous	very very dangerous
(0)	(1)	(2)	(3)	(4)

_____ 12. When you were watching the scene where Fritz fights the snake, did you do anything or think about anything to help yourself not feel scared? What did you do or think about?

____

____

____

____ 13. Now I want you to think about the introduction you heard before the show started. Remember I said that the show was about two brothers named Fritz and Ernest? What else did the introduction tell you about the show? [Anything else?]

____

____

____

____ 14a. Remember that Fritz was fighting with the snake when the program ended. What do you think will happen next in the show?

____

____

____ 14b. Do you think Fritz will get away from the snake?

no (1)   yes (2)

____ 15a. Did you ever see the show about Fritz and Ernest before today?

no (1)   yes (2)

____ 15b. If yes to 15a: What was the show called?

____

wrong/DK (1)   correct (2)   N.A. (9)

____ 16. In general, how do you feel about snakes? Do you like them or do you dislike them?

like   dislike

How much do you like/dislike snakes?

like them a little bit (6)	like them pretty much (7)	like them very much (8)	like them very very much (9)
dislike them a little bit (4)	dislike them pretty much (3)	dislike them very much (2)	dislike them very very much (1)

____ 17. How do you feel about scary TV shows and movies? Do you like them or do you dislike them?

like   dislike

How much do you like/dislike scary TV shows and movies?

like them a little bit (6)	like them pretty much (7)	like them very much (8)	like them very very much (9)
dislike them a little bit (4)	dislike them pretty much (3)	dislike them very much (2)	dislike them very very much (1)

OK, now I'm going show you how the program ends. [Play ending]

____ 18a. How did you feel just now, when the scene ended, and these were the pictures you were seeing? (Show photos)

____

____ 18b. Did you feel happy, sad, scared, or just OK? (board A)

happy (1)   sad (2)   scared (3)   just OK (4)

____ 18c. How ________ did you feel? Did you feel:

a little bit (1)   pretty (2)   very (3)   very very (4)   [just OK] (0)

TITLE OF THESIS THE EFFECTS OF FOREWARNING OF A THREATENING EVENT AND ITS SUCCESSFUL RESOLUTION ON CHILDREN'S EMOTIONAL RESPONSES TO A TELEVISED FILM SEQUENCE

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COLLEGES AND UNIVERSITIES: YEARS ATTENDED AND DEGREES

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MEMBERSHIPS IN LEARNED OR HONORARY SOCIETIES

PUBLICATIONS See next page

CURRENT DATE August 4, 1988

List of Publications

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