CHILDREN AND TELEVISION: EFFECTS OF THE MEDIUM, ITS CONTENT AND ITS FORM[1,2]

ALETHA HUSTON-STEIN
JOHN C. WRIGHT
University of Kansas

"Move over, parents and teachers—television gets equal time." At one level, the television medium has been getting equal or more than equal time from most children for many years. The figures on its use are cited endlessly, though estimates vary considerably. American children average 2-4 hours a day of television viewing; in the course of a year, they spend more time watching television than in any other single activity except sleeping (Lyle, 1972).

At a second level, the medium has begun to get equal time in psychological research. It is gradually being recognized as a socializing influence on a par with family, school, and peers. One of our purposes in this paper is to do a brief historical overview of research on television and children in order to summarize what major questions have been asked and what knowledge we have gained about the medium. In this overview, we try to highlight the ways in which social issues have guided the research questions asked and led to the neglect of other equally interesting questions.

On a third level, some research attention has returned to a consideration of television as a medium rather than focusing solely on its content. One aspect of that new focus, examining the formal properties of the medium, is the subject of the second part of this paper.

First, the historical overview. In the period from 1950 to 1960, the United States became a nation of television viewers. Television spread so rapidly that well over 90% of American homes had at least one television set by 1960. Quite understandably, many people were concerned with the effects of this new medium on

[1]This paper is based in part on an Invited Address (by Aletha Huston-Stein) to Divisions 15 and 7 of the American Psychological Association, San Francisco, August, 1977; and in part on a symposium presentation (by John C. Wright) at the Biennial Meeting of the Society for Research in Child Development, San Francisco, March, 1979.

[2]Much of the research described was supported by a grant from the Spencer Foundation to the authors.

people's lives. The major question asked in research had to do with the effects of the medium itself. What activities were abandoned in favor of television viewing? Did viewing lead children to spend less time playing with friends? Did television lead to less family interaction? Did TV provide an escape into fantasy that would be too readily used by disturbed or unhappy children? Did it interfere with school work? And many more.

These questions and many others were addressed in large-scale survey studies. The two best known were a series reported by Schramm, Lyle, & Parker (1961) on American and Canadian children and a series reported by Himmelweit, Oppenheim, and Vince (1958) on British children. In effect, all of these early studies agreed in finding surprisingly little impact of television on children's lives. The worst fears of critics who envisioned zombies staring vacantly at the idiot box were not confirmed. For the most part, television replaced activities that were "functionally equivalent": radio, comic books, movies, and other "pictorial media." It did not appear to replace leisure reading, though more recent findings suggest some reduction in reading. Families spent slightly more time together with television than without, though, of course, some of that time was spent watching television together. There was no reduction in peer group interaction, play activities, or other forms of social activity. Some disturbed and socially isolated children watched large amounts of television, but it appeared that the symptoms of disturbance had preceded the heavy television use rather than the other way around. Rather than holding children mesmerized for hours in front of the tube, television became integrated into other activities and life patterns. Viewing was often done in social groups or accompanied by other activities such as play, homework, or hobbies.

Although the research of the 1950's led to the conclusion that television as a medium had less drastic effects on children and family life than some had feared, it was nevertheless clear that television had become an integral part of the family. Most homes had at least one set; and people did spend a large amount of time watching it. Television was taken for granted, yet it gradually became clear that a great deal was being learned from television, often through a process of incidental rather than intentional learning. For children, television had become a major socializing agent. (See Maccoby, 1964, for a review of this early research.)

Attention in the 1960's turned, therefore, to an examination of what this socializing agent was teaching. Research shifted from the *medium* itself to the *content* of the programs presented. Very quickly, researchers focused on the enormous amount of violence shown on television. The major research question for the decade of the 60's was, what are the effects of television violence on aggressive behavior?

This important, but rather narrow question occupied a great deal of time, money and talent, culminating in a million dollars and 23 studies assembled for the Surgeon General's Advisory Committee on Television and Social Behavior (1972). That Committee concluded that television violence was causally related to aggressive behavior, then qualified their conclusion to say that the instigating effects of violence occurred primarily for children who were already somewhat aggressive and only in some environmental contexts. As the Committee contained several members with a vested interest in commercial television, there had to be strong empirical support for such a conclusion to emerge at all.

The research of the 1960's yielded a wealth of information on television violence and aggression, including many of the mediating variables involved. The narrow focus on this issue was due to the social importance of violent behavior, particularly in a decade where both government and citizens used violence extensively as a means to obtain their goals. It also was due to the political controversy generated by a challenge to the bread and butter of the television industry.

The Surgeon General's Committee report (1972) and the studies associated with it (Comstock & Rubinstein, 1972a; 1972b; Comstock, Rubinstein, & Murray, 1972; Murray, Rubinstein, & Comstock, 1972; Rubinstein, Comstock, & Murray, 1972; Surgeon General's Advisory Committee on Television and Social Behavior, 1972) served as a virtual finale to research on television violence. Many people felt that the answers obtained from that research were as definitive as any that were likely to emerge from empirical studies. For instance, in 1975, several foundations held a conference of researchers, producers, and social critics of television to form recommendations for future funding priorities in television research. One striking feature of the recommendations emerging from that conference was the absence of concern with television violence (K. Anderson, Comstock, & Dennis, 1976). The decline in research interest in violence does not mean that available data are perfect or that the social problem of television violence has been solved, but that the benefits that could be derived from improved methods and corrections of faults in existing studies would be relatively minor. In addition, it became quite clear that research simply showing negative effects of television violence, no matter how definitive, would not change the content of commercial television programs. Violent content has continued at approximately the same levels on network television for the past ten years. After some decline in violence on children's programs, the 1978 season saw a return to near-record levels of 25 incidents per hour (Gerbner, Gross, Signorelli, Morgan, & Jackson-Beech, Note 1).

The 1970's brought an expansion of topics in television research as well as a general increase in awareness and interest in media research. Concern about the harmful effects of television was extended from violence to advertising and social stereotypes. In both cases, the impetus for research arose primarily from the activities of citizens' groups such as Action for Children's Television and Council for Children, Media, and Merchandising, and from political movements for civil rights and women's rights.

A second trend of the 1970's, both in research and in television programming, was the effort to capitalize on the power of television for positive socialization of children. "Sesame Street" and "Electric Company" broke the ground for widespread acceptance and viewing of programs designed to teach children. A crucial element in the initial success of "Sesame Street" was careful evaluative research that documented both the extent of viewing the program and the gains in knowledge resulting from it (Ball & Bogatz, 1970; Bogatz & Ball, 1971).

"Sesame Street" also illustrates a change in the style of research in the 1970's. Psychologists, educators, and other specialists with knowledge about children have become involved in "formative research"—that is, research that is designed to provide direction and feedback during the process of production—as well as evaluation (Lesser, 1974).

The positive socialization potential of television has also been explored in studies of *prosocial* television content. Some researchers reasoned that if children would imitate violence, they might equally well imitate cooperation, helpfulness, delay of gratification, task persistence, or creative use of fantasy. On the whole, the data have supported that assumption (Stein & Friedrich, 1975).

Research on "Sesame Street" and prosocial programming probably led to some changes in commercial programs. Some producers were convinced for the first time that it was possible to make educational programs that would hold large audiences. Further, identifying and specifying prosocial behaviors provided concrete ideas for content other than violence. In 1974, CBS ran a full page ad in the *New York Times* lauding its new "prosocial" children's programs. It appears that there is more programming of that type now than there was five years ago, though it is still a small island in a large sea of the same old stuff. The

formats of children's programs have also moved toward those developed by Children's Television Workshop. The magazine-format of Sesame Street and Electric Company are being used on Saturday morning shows more because they hold children's attention than because they teach.

In summary, the 1950's were times of concern with the effects of television as a *medium* on the lives of children and families. The major conclusions that emerged from this early research were ironically contradictory. On the one hand, most researchers concluded that television did not have the impact on people's lives that had originally been anticipated and feared by some. On the other hand, television had insinuated itself into the American home so thoroughly that it had become a major part of the lives of virtually all children.

In the 1960's, concern shifted to the content of this almost universal socializing agent—specifically to the effects of violent content on aggressive behavior. The conclusion emerged quite clearly that television violence instigates aggressive behavior, though some disagree on the magnitude of these effects.

In the 1970's, research has turned to other potentially negative influences of television —advertising and social stereotyping—and to positive uses of television to teach cognitive skills or to socialize prosocial rather than anti-social behavior. Most of these research directions are very much in process at the present time.

Form In The Television Medium

While all of these research thrusts are important and need to be followed, it may be that we are ignoring other important aspects of television by focusing almost entirely on the content of its programs. Perhaps we dropped prematurely the questions about the effects of the medium itself. Or perhaps it is time to return to those questions in a more refined way. We turn now to a new research area—examining the *forms* of the medium rather than its *content*.

Because television and film are audio-visual media, they organize and present content with certain forms or formats. The visual image can jump from one viewing angle to another, it can zoom, pan across a scene, fade, dissolve, slow down or speed up motion, just to name a few of the more common visual techniques.

In the auditory dimension, one can have dialogue and narration, but it is possible to present musical variation, laughing, and all manner of artificial noises and sound effects ranging from a creaking door to a whistle as Road Runner once again sends Wile E. Coyote to the bottom of the chasm. At a more molar level, programs can differ in pace by changing scenes, characters, or speakers more or less rapidly; and they can vary in the level of action or movement.

All of these formal, as opposed to content, features of the medium have typically been the province of the script writer, the producer, and the editor. They have been considered important as tools of the trade, but virtually all of the knowledge about their effects was based on lore and "seat of the pants" experience in the film-making business.

Yet many years ago McLuhan (1964) suggested that the formal properties of audio-visual media might have profound effects on basic modes of thinking and cognitive processing. He proposed that filmic representation differed in fundamental ways from verbal forms of representation and that individuals who got a large amount of their information from visual media like television or film would learn a different "language" or at least a new "grammar." They would learn the codes of the film medium and would be able to understand information presented in these codes. Perhaps more important, they would adopt those codes in their own thinking. The current upsurge of interest in visual literacy or media literacy is an outgrowth of McLuhan's thinking (e.g., Dondis, 1973).

In addition to the theoretical interest generated by McLuhan's proposals, there are some practical reasons for studying forms in television. If one could identify the formal properties that are effective in attracting and holding child audiences, those features could be used to make educational and prosocial television maximally effective. Further, if such features could be separated from objectionable content, particularly violence, then they might be used by commercial producers to make less violent programs that could survive the ratings wars.

Finally, formal features may affect behavior. We have been so focused on content that we have often ignored the possibility in many existing studies that the behavioral effects of violent or prosocial programs might have resulted from form as well as content. For instance, most of the studies of prosocial television have used "Mr. Rogers' Neighborhood," a program that is striking for its slow, gentle pace and quiet tone (Stein & Friedrich, 1975). Resulting changes in cooperation, helping, or task persistence could be partly due to such formal features.

The study of formal features is new, and the available data so far are sparse. Nevertheless, we would like to raise some important and interesting questions about formal features and to review the existing literature in an effort to provide some tentative answers to these questions. We will consider the relation of formal features to attention first, comprehension second, and finally, behavior.

Attention

Three major questions about the effects of formal features will be considered: 1) What formal features are most effective in attracting and holding children's attention to television programs? 2) Are formal features more or less important than content, especially violent content, in gaining or holding attention? 3) Are there developmental changes in the effects of formal features on attention?

The first question, what formal features are most effective in attracting and holding attention, has been addressed in several studies using different types of programs—"Sesame Street" (D.R. Anderson & Levin, 1976; D.R. Anderson, Levin, & Lorch, 1977), "Lassie" (Rubinstein, Liebert, Neale, & Poulos, 1974), commercials (Wartella & Ettema, 1974), Saturday morning cartoons (Watkins, Huston-Stein, Wright, Potts, Calvert, & Rice, Note 2), and a variety of children's programs (D.R. Anderson, Alwitt, Lorch, & Levin, in press). Unfortunately, different systems of scoring formal features have also been used. Nevertheless, there is some consistency in the findings.

First, auditory features other than dialogue, such as lively music, sound effects, peculiar voices, non-speech vocalizations, and frequent changes of speaker attract and hold children's attention. Visual features such as zooms, pans, and the like have less influence. Second, in most studies, high levels of physical activity or action elicit and maintain children's attention. Third, changes in scene, characters, themes, or auditory events are especially useful for eliciting attention, though they are less important for maintaining it once the child is looking.

The finding that non-verbal auditory events, action, and change attract and hold children's attention is not terribly surprising, but the failure of visual events to do so consistently may be somewhat surprising to those who have focused on the visual nature of an audio-visual medium. By definition, visual features cannot affect attention unless the person is already looking, but even then there is little evidence that they *hold* attention. A series of studies of very young children (1-3-years-olds) using a live model supports the predominance of the auditory cues. When visual and verbal cues from an adult dictated contradictory behavior, these young children followed the auditory cues more often than the visual cues (Volkmar & Siegel, Note 3; Volkmar, Hoder, & Siegel, Note 4).

The second question concerning attention is whether formal features have more or less influence than content, especially violence. To our knowledge, our work is the only set of studies examining this question. Clearly, formal features can be separated conceptually and operationally from violent content. In our scoring system, action, pace, and other formal features are defined independently of violent content. In one study of preschoolers, programs were selected to be high in both action and violence, high in action and low in violence, or low in both action and violence. (We were unable to find a low action-high violent program to complete the design.) Children's total attention differed as a function of action, not of violence. That is, they were as attentive to high action without violence as they were when it accompanied violence (Huston-Stein, Fox, Greer, Watkins, Whitaker, Note 5).

A more molecular analysis was performed for these three programs and for four other cartoons by dividing each program into 15-second intervals and correlating attention with formal features and violent content. Multiple regressions were performed to determine which features were the best predictors of attention in each program. Violence did not enter any of the seven multiple regressions as a predictor that contributed significant variance independent of formal features, but considerably more data on different programs and different age groups are needed for acceptance of this null conclusion.

The third question concerning attention, are there developmental changes in children's response to formal features? has more theoretical interest for educational and developmental psychologists. In an earlier paper (Huston-Stein & Wright, Note 6), the authors proposed a hypothesis about developmental changes in children's methods of getting information (Wright & Vlietstra, 1975; Wright, Note 7).

In that model, the initial mode of getting information is *exploration*. It involves responding to the most perceptually salient features of the environment in a relatively discontinuous and impulsive manner. As children gain age-related conceptual abilities *or* as they become more familiar with a particular stimulus situation, they shift to the *search* mode. Search is goal-directed and systematic, and the person attends to those stimuli that are informative or relevant to the goal regardless of their perceptual salience. One of the most important features of this model is the notion that familiarization or experience with a task is as important as maturationally-based cognitive change in bringing about a developmental shift for a given task or situation. In applying this model to children's attention and comprehension of formal features in television programs, we proposed that younger children and less experienced viewers would respond to the most salient features as isolated attention-getting events of interest in their own right. The loudest, weirdest sounds; the most unusual visual effects, and so on should be most likely to attract the attention and interest of young and inexperienced viewers.

Older and more experienced viewers would have become habituated to such salient formal features and would, therefore, be less responsive to them. They would be more interested in the content and its meaning. More important for this discussion, they would also have a better understanding of the filmic codes and structures signified by formal features. For them, such features would serve as syntactic markers. For instance, they would attend to a camera dissolve not because it was an interesting visual event, but because it signified a change in time or place. In effect, we propose that the acquisition of filmic codes described by McLuhan (1964) follows a developmental course based on more general cognitive developmental changes and on experience with the medium. The available studies of attention support the hypothesis that young children will be more influenced by perceptually salient forms than older children. In one study, three- and four-year-olds showed bigger differences in attention to commercials rated high and low in auditory features than did seven- and

eight-year-olds (Wartella & Ettema, 1974). In our research, preschool children were more attentive to high action, salient auditory features, and some visual features in cartoons than were third- and fourth-graders. However, programs with rapid pace (i.e., frequent scene and character changes) were even more attractive to older than to younger children (Watkins, et al., Note 2). The frequent changes of scene and character offer central plot information which the experienced viewer is seeking while noises, physical movement, and camera tricks are merely perceptually salient events.

What can we conclude about formal features and attention? First, the formal features that attract and hold attention most effectively appear to be non-verbal auditory techniques, action, and frequent changes or rapid pace. Visual techniques are apparently less important. Second, these features can be separated conceptually and operationally from violent content, and some preliminary findings suggest that they affect attention more than violence does. Finally, it appears that *preschool* children are responsive to formal features purely on the grounds of perceptual salience, whereas older children are selectively attentive to information-bearing features.

Comprehension

There are two questions concerning formal features and comprehension to be addressed: 1) Are there developmental changes, based on age *or* on viewing experience, in children's understanding of and ability to use the filmic codes represented by formal features? 2) How do formal features affect learning of content?

The major developmental research concerned with these questions has been conducted by Salomon and his colleagues at the University of Jerusalem (Salomon, 1974; 1976. Note 8; Note 9). They conceptualized formal features as media codes that impose transformations on the messages contained in the presentation. Some formal features may be viewed as representing certain mental skills or mental operations. For example, zooming in and out literally portrays the mental operation of relating parts to a whole. Camera cuts that make the image jump from one part of a physical space to another, or from one view of an object to another, correspond to the mental operations of coordinating spaces and taking different perspectives.

Salomon proposes that audio-visual media codes can have two functions in the development of such mental skills: the one that is developmentally first is the function of "supplanting" the skill. That is, the camera essentially performs the operation *for* the viewer; presumably the viewer can learn the skill from watching the camera. A zoom is an example of a camera operation that supplants the skill of analyzing a complex array into subparts or isolating one small part at a time.

The second function of media codes is to "call upon" an already existing skill in the viewer. For example, a close-up shot presumes that the viewer can already relate small parts to a larger whole; it does not perform the operation as a zoom does.

Data on both Israeli and American children support the hypothesis that the understanding of and ability to use common media codes increase with age and, in some cases, with media experience. Younger and less experienced viewers benefit more from media formats or formal features that supplant the intellectual skills to which they relate. Older and more experienced viewers understand formats that call upon related mental skills better than do younger and less experienced viewers (Salomon, Note 9).

These data support to a limited degree McLuhan's hypothesis that audio-visual media present new forms of information processing which are internalized by the developing viewer. They also support in part our hypothesis that *both* age-related cognitive development and experience with the television medium increase the ability to use and understand the codes of the medium.

The second question concerning comprehension is, how do formal features affect comprehension of the content of a message? At one level, it might be expected that comprehension would be higher for any content that was associated with high levels of attention. However, high attention does not guarantee comprehension (Lorch & Anderson, in press). In particular, young children often attend to and recall content that is incidental and irrelevant to the message that was considered central by the adult producers (Collins, 1970; Hale, Miller, & Stevenson, 1968; Hawkins, 1973). If features such as sound effects draw attention to such incidental content, the result might be lowered understanding of central content. For instance, if a cereal commercial carries a message about vitamins and nutrition, the content may be lost if it is accompanied by sound effects and visual camera tricks that distract from that message.

Salomon's work (Note 8) also indicates that children understand content messages better when they understand the formats used to present the content. For instance, children who were good at relating parts to a whole, and who could, therefore understand a close-up format, learned more content from a film using close-ups than did children who were less skilled in understanding that format.

In one of the authors' studies (Calvert, Watkins, Wright, & Huston-Stein, Note 10), children were tested for recall of television content that was presented with formal features that were highly salient (action, sound effects, or visual special tricks) or low in salience (primarily verbal dialogue). Children remembered central, theme-relevant content better when it was presented with highly salient formal features than when it was presented with low salience techniques. Young children (kindergarten age) benefitted from the salient features more than older children (third and fourth graders).

Therefore, the tentative answer to this second question concerning the effects of formal features on comprehension of content is that associating content with a formal feature may increase comprehension of the content *if* the feature is familiar and understood by the child *and if* it focuses attention on central rather than incidental content. If the child does not understand the code represented by the feature or if it focuses attention away from the central content, it may interfere with comprehension.

Social behavior

Do children imitate formal attributes such as action and pace? Do these formal features have different effects on behavior than violent content?

The authors suggested earlier that one reason for attempting to separate formal features from content was the effort to identify characteristics of programs that would interest child audiences without some of the negative behavioral effects of violence. For example, children might imitate physical activity without a corresponding rise in aggressive behavior if a program contained a lot of nonviolent action. In a few of the laboratory studies testing the effects of aggressive models, there have been control treatments presenting highly active, but nonaggressive models (Bandura, Ross, & Ross, 1963; Christy, Gelfand, & Hartmann, 1971). Children did not show high aggression after seeing these models, but they did have high levels of physical activity. In a field study, Israeli children exposed to "Sesame Street" on a regular basis had lower levels of perseverance on a routine task than control subjects (Salomon, 1972). Although this finding was attributed to the rapid pace of the program, the results of a short-term laboratory study comparing high- and low-paced segments of "Sesame Street" for American children did not support the hypothesis that pace affected self-regulatory behavior (Anderson, Levin, & Lorch, 1977). It is possible that the Israeli children were affected more than the American children because of less previous television exposure and because

of the longer duration of the field study as compared to a brief laboratory exposure.

If children imitate specific features of both form and content, then we should probably recommend to producers that they use lots of action, but keep it nonviolent. However, another hypothesis, based on general arousal theory, is that both formal complexity and violent content lead to a state of general arousal that, in turn, increases the likelihood of whatever behavior is cued by the situation. According to this hypothesis, in any situation where aggression is likely, exposure to television programs containing high levels of action, pace, and the like would increase aggressive behavior, regardless of their content.

The arousal hypothesis has been tested in some studies of adolescent and adult males. In one study (Watt & Krull, Note 11), physiological arousal during and immediately after viewing a television program was associated both with the complexity of formal features and violent content. In another, adolescents' typical levels of aggression were correlated with both the formal complexity and the violent content of the programs they watched on television (Krull & Watt, Note 12). In each case, form and content made independent contributions.

Two studies have been completed in our Center for Research on the Influences of Television on Children that were designed to evaluate the effects of form and content independently. In the first (Huston-Stein, et al., Note 5), animated children's program segments containing different levels of action and violence constituted the treatment conditions. There were three programs: high-action/high-violence, high-action/low-violence, and low-action/low violence. A control group saw no television. We were at that time unable to find a comparable children's program with low-action, but high violence. (That empty cell has since been filled; but subsequent formal-feature analyses of 64 children's programs has shown that non-verbal aggression is almost always portrayed with high levels of action and salient visual and auditory features.)

In the second study (Greer, Potts, Wright, & Huston-Stein, Note 13), commercial advertisements with different levels of salient formal features distributed uniformly or clustered within a neutral program constituted the experimental treatments. Two sets of food commercials were assembled: one set was high on action, scene and character changes, and most of the visual effects; the other set was low on these features. There was virtually no aggression or violence in the content of either set, and the program in which the commercials were placed (an episode from Captain Kangaroo) was both nonaggressive and relatively low in pace and action.

In both studies, pairs of preschool children were observed in free play sessions before and after viewing. In both, highly salient formal features stimulated aggressive behavior. In the first study violent content did not add to the level of aggression found after high action alone. In the second study highly salient formal features led to high levels of aggression, regardless of their distribution in the program and their lack of violent or aggressive content. These findings provide strong support for the notion that arousing form can lead to increased aggression, even without the modeling of violent content. This outcome agrees with Krull and Watt in support of the arousal model, but it fails to provide producers of children's television with a way of arousing interest that avoids the adverse effects of violence—it seems that high hype has some of these same adverse effects too!

Despite these findings, it is important to note that aggressive behavior is not a necessary result of general arousal. Arousal activates whatever behavior is highest in the person's response hierarchy and/or whatever behavior is cued by the situation. Therefore, arousal might equally well lead to increases in prosocial or other forms of behavior if the situation suggested these. A study currently in progress is testing this notion.

It appears that no simple causal segregation has yet been or will be easily achieved between the effects of television form and content on young children's social behavior. Both form and content can influence arousal. Both can serve as models for behavior. Arousal both enhances attention to the program and enhances the likelihood that its form, its content, and other situational cues present at the time of viewing will be responded to by the child viewer. Separating arousal attributable to formal complexity from arousal attributable to exciting content is another difficult research task that lies ahead. But, producers of commercial and educational programs for children could depart from the stereotyped formats and begin to break up the expected correlations between level of action, excitement, or humor and amount of violence, aggression, or hostility. Then, perhaps arousal in more deliberate and moderate dosages can be put to work to facilitate the communication of educational and prosocial content, and behavior. Perhaps the next TV generation will not have such stereotyped expectations of form-content relationships. And perhaps the rating wars that now sustain the commercial producers of children's programs can be fought in the future over who can produce the most nearly optimal degree of arousal and positive modeling, rather than with ever-increasing hype and violence.

To recapitulate and conclude: beginning with questions about the impact of television as a medium on the lives of children, research turned quickly to the content of television—first to its harmful effects, later to its potential as a positive socializing agent. Despite the fact that strong, dramatic effects of television (that is, effects accounting for large portions of the variance in behavior) have rarely been demonstrated, television has become such an integral part of our children's lives that we take for granted some of its more subtle influences. For the generations of children growing up in the past 20 or 30 years and in the foreseeable future, television is a major socializing agent. It is time to examine more carefully the effects of the medium itself and to do more refined analyses of its form as well as its content. Learning more about the effects of formal characteristics of the medium on children's attention, comprehension, and behavior may lead to a better understanding of the development of cognitive sophistication in the codes of the media as well as to practical information about ways in which antisocial content can be reduced in commercial programs without losing audiences and, finally, to knowledge about production techniques that may maximize the impact of prosocial and educational programming for children.

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