

The Effects of Television Commercial Form and Commercial Placement on Children's Social Behavior and Attention

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GREER, DOUGLAS, POTTS, RICHARD, WRIGHT, JOHN C., and HUSTON, ALETHA C. *The Effects of Television Commercial Form and Commercial Placement on Children's Social Behavior and Attention* CHILD DEVELOPMENT, 1982, 53, 611-619 Pairs of preschool children saw television commercials that varied in formal features (high vs low perceptual salience) and placement in a television program (dispersed through the program vs clustered at the beginning and end). Salient formal features were defined as high action, rapid change of scene and character, and frequent use of camera techniques such as cuts and pans. Each pair participated in baseline and postviewing free-play sessions. Social behavior was scored for aggression, imaginative play, positive social interaction, and activity level. Children who saw high salience commercials were more aggressive after viewing than those who saw low salience commercials. There was a weaker tendency for imaginative play to increase after high salience commercials that were shown in clustered arrangements. There were no differences in positive social interaction or activity level. Salient formal features maintained attention throughout commercials better than nonsalient features, particularly in the dispersed format.

Purpose

Formal features of television programs are visual and auditory events that can be defined more or less independently of the content of a particular program. We developed a taxonomy of formal features to describe children's television programs based on detailed coding of two large samples of programs (Huston, Wright, Wartella, Rice, Watkins, Campbell, & Potts 1981). Some clusters of features were defined as perceptually salient because they represented high levels of movement, intensity, change, novelty, contrast, and the like listed as perceptually arousing by Berlyne (1960). Some of these clusters were *action* (defined as level of physical movement of characters on the screen), *pace* (rate of scene and character changes), and *visual change* (defined by the rate of cuts, pans, and trucks).

Programs that have high rates of perceptually salient action, pace, and visual change may have both attention-getting and arousal effects on viewers, regardless of their content. The purpose of the present study was to investigate the effects of salient formal features

on two distinct consequences: social behavior after viewing and attention during viewing. A second purpose of the study was to determine the effects of commercial interruptions on children's social behavior and attention patterns.

Social Behavior

The effects of television content (aggressive, prosocial, or other types) on analogous forms of children's behavior are well documented (see Comstock, Chaffee, Katzman, McCombs, & Roberts 1978, Stem & Friedrich 1975). These findings have usually been interpreted in the framework of modeling or observational learning processes. However, work by Bryant and Zillman (1979), Tannenbaum (1972), and Watt and Krull (1974) suggests that television content may also produce general arousal. The major difference between the modeling and arousal hypotheses is that arousal can increase the likelihood of behavior that is different in kind from the behavior shown by the model. Arousal is conceptualized as a motivational state that provides nondirected energy that increases the probability of *whatever* behavior is cued by the environment or by individual predispositions.

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Formal features of television could affect social behavior through modeling or arousal or both. For example, high levels of action might be imitated with increased activity level. In a few laboratory studies of imitation, children who saw highly active, nonaggressive models manifested high levels of nonaggressive physical activity (Bandura, Ross, & Ross 1963, Christy, Gelfand, & Hartmann 1971). On the other hand, salient formal features could produce arousal which might result in aggressive behavior in some circumstances, even when the content was nonviolent.

One study in our laboratory was designed to test the independent effects of televised action and violence on preschool children's social behavior. Children who saw programs with high levels of action, particularly when the content was violent, were less imaginative and slightly more aggressive than those who saw a program with low action and violence or saw no television at all. There were no differences in activity level (Huston-Stein, Fox, Greer, Watkins, & Whitaker 1981). One problem in interpreting these data is that children may associate certain features or plot elements of cartoons with violence even when no literal aggression occurs. Commercials do not contain such indirect content or plot cues, so it may be possible to find more "pure" effects of formal features with commercials than with most programs. Therefore, commercials were used in the present study.

Varying commercial placement permits comparison of arousal and frustration as contributors to social behavior. If frequent interruptions of the television program were frustrating, then aggression might be higher in the dispersed than in the clustered format. On the other hand, if salient formal features were arousing, the effects might be greater in the clustered format because the children are exposed to several commercials in a row immediately before their play is observed instead of seeing the arousing commercials distributed through a program that is low in action, pace, and visual change.

Attention

Wright and Vlietstra (1975) proposed a developmental transition in children's attention patterns from "exploration" to "search." Applied to television, the model leads to the prediction that young viewers are particularly responsive to the perceptually interesting and stimulating formal features of programs (Wright & Huston, in press). Therefore, in the present

study, it was expected that the perceptually salient features of commercials would elicit and maintain preschool children's attention.

Previous studies of children's attention to television programs support the hypothesis that action, frequent changes in scenes, characters, themes, or auditory events, and nonverbal auditory features such as lively music, sound effects, and peculiar voices are associated with high levels of attention for young children (see Rice, Huston, & Wright, in press). Similar results were found for commercials in one study (Wartella & Ettema 1974). There is some suggestion in the literature that, as children get older, they "turn off" attention to commercials fairly quickly. For example, elementary school children's attention declined during 30-sec commercials in one recent study, and attention was low when one commercial followed another (Zuckerman, Ziegler, & Stevenson 1978). Few direct observational data exist to determine whether such patterns also occur for preschool children, but, to the extent that form is important in its own right, such declines would not be expected.

High rates of commercial interruption (dispersed through the program) should be more attention getting than low rates (commercials clustered at beginning and end) because interruptions involve visual and content change, but the evidence is contradictory on this point. In one study (Atkin, cited in National Science Foundation Report [1977]), attention was higher to clustered than to dispersed advertisements, in another (Duffy & Rossiter, cited in National Science Foundation Report [1977]), the results varied with the age of the children (first vs fourth graders). The dispersed format produced higher attention than the clustered format only for older children.

In the present study, high and low salience commercials were shown in clustered or dispersed format to preschool children. The following social behaviors were observed before and after viewing: aggression, imaginative play, positive social interaction, and activity level. Visual attention was recorded during viewing.

Method

Subjects

Sixty-four subjects (32 female and 32 male) from a university preschool participated in the study. The average age was 54.83 months.

Procedure

Pairs of children participated in two sessions. Pairs were of the same sex, similar in age, and from the same classroom. In the baseline session, each pair was brought by an experimenter to a laboratory room containing a television set and several toys. The children were told that the television would not be on, that they could play with the toys, and that the experimenter would be in the next room if they needed him. The experimenter left, and the play session lasted 10 min.

In the second session a few days later, the same pairs were brought to the experimental room. They were told that they were going to see a television program before the toys were brought in. They were seated at a table facing each other so that each child was at a 90° angle to the television screen. They were told they could talk, draw, or watch TV and that the experimenter would be in the next room. When the program was over (approximately 17 min), the experimenter brought the same toys that were used in the baseline session into the experimental room and the subjects were told that they could play with them. The experimenter left the room, and the children were allowed to play with the toys for 10 min. All subject pairs except two participated in the experimental condition within 3 days of their baseline session. One delayed pair was tested 7 days later, the other pair was tested 3 weeks after the baseline session.

Design and Experimental Treatments

Each pair saw a 12-min segment of "Cap-

tain Kangaroo" accompanied by 5 min of commercials. The segment of "Captain Kangaroo" remained constant, but the commercials were either high or low in salient formal features. They either interrupted the program frequently (dispersed format) or did not interrupt the program at all (clustered format).

Formal features—An initial sample of 51 food commercials broadcast during October 1977 were scored for action, pace, and visual change. *Action* was defined as the amount of physical movement by characters. *Pace* was the rate of change of scenes and characters. *Visual change* included camera cuts, pans, and trucks (giving the appearance of camera movement). All of these categories were used in the larger project (see Huston et al. 1981). Interscorer reliabilities were .80 or above for all categories. Eight commercials that were high and 10 that were low on these features were selected for use in the study. Both sets of commercials had a total duration of 5 min because two high formal feature advertisements lasted 60 rather than 30 sec each.

The mean levels of action, pace, and visual change for the two sets of commercials are shown in table 1. The differences were significant for all three formal feature variables. Although the commercials were drawn from a homogeneous sample of children's food advertisements and were selected for form, it was possible that certain kinds of content might be confounded with form. Therefore, the commercial stimuli were scored for the sex and age of characters and for the type of product ad-

TABLE 1
LEVELS OF FORMAL FEATURES AND CONTENT VARIABLES FOR
HIGH AND LOW SALIENCE COMMERCIALS

FORMAL FEATURES	SALIENCE M		N (H/L)	t(18)
	High (H)	Low (L)		
Action level ^a	3.04	1.21		7.073*
Pace (rate per 30 sec)	3.9	2.2		4.320*
Visual features (rate per 30 sec)	12.2	6.7		17.123*
Content				
Sex index ^b	20.4	14.0		5.800*
Age index ^c	14.0	-4.0		6.225*
Product (N commercials)				5.440*
Fast food			5, 1	
Cereal			5, 5	
Snack/candy			0, 4	

^a Action was scored on a scale from 0 (no characters present) to 4 (characters moving at the approximate speed of running or faster) for each 15-sec interval.

^b Sex index = (N sec male characters on screen) - (N sec female characters on screen)

^c Age index = (N sec adults on screen) - (N sec children on screen)

* $p < .01$

vertised The sex index of characters was defined as the number of seconds during which male character(s) were on screen minus the number of seconds during which female(s) were on screen The age index was similarly defined as the duration of adult presence minus the duration of child presence Product types were snack food/candy, cereal, and fast food The means and frequencies of these content variables in the high and low salience commercials are shown in table 1 The high salience commercials had significantly higher indices of male and adult characters than the low salience commercials Although cereals were equally represented in both groups, the high salience commercials more often advertised fast food, and the low salience commercials more often advertised snacks and candy A correlational analysis was therefore performed to assess the extent to which commercial group differences were a function of form and content variables A dichotomous variable, salience (1 = low salience, 2 = high salience) was highly correlated with action, $r(18) = .87, p < .01$, pace, $r(18) = .56, p < .05$, and visual change, $r(18) = .87, p < .01$, but it was more weakly related to the content variables, sex index, $r(18) = .43, NS$, and age index, $r(18) = .45, NS$ Product type was coded as 1 = snack/candy, 2 = cereal, and 3 = fast food in order to maximize the association with formal feature salience The correlation of product type with salience was $r(18) = .57, p < .05$ When sex, age, and product type were partialled out, salience was still significantly associated with action, $r(15) = .73, p < .01$, and visual change, $r(15) = .77, p < .01$, while the correlation with pace was not significant, $r(15) = .45$ These analyses demonstrate that the commercials in the two treatments did have distinctly different formal features which were independent of content differences

Commercial placement—The clustered commercial format groups saw 2½ min of commercials immediately before and 2½ min immediately after the program, there were no commercials during the program itself The dispersed commercial format groups saw a 30-sec commercial prior to the program, a 30-sec commercial immediately after the program, and four 1-min commercial interruptions during the program The commercial interruptions were placed at natural break points

Social Behavior

The toys provided in the baseline and experimental sessions were selected to facilitate

a variety of behaviors It was assumed that a child might elect to play with those toys that were suited to the behavior tendencies instigated by the formal feature and interruption conditions Toys were provided that facilitated each of the predicted behavior patterns, for example, Bobo doll for aggression, zoo animals for fantasy, blocks for constructive activity and cooperation, and stick horses for active, non-aggressive play Other toys included play money, a Nerf ball, an airplane and bus with wooden people, and a small Fat Albert doll

Both the baseline and experimental play sessions were recorded on videotape The play sessions were scored for social behavior using a detailed coding system to measure aggression, imaginative fantasy, activity level, and positive social interaction An outline of these categories appears below

A *Aggression*

- 1 Physical aggression = physical attack, obstruction, teasing, threatening gestures
- 2 Verbal aggression = angry commands, verbal teasing, derogation
- 3 Object aggression = physical attack on an object

B *Imaginative fantasy*

- 1 Solitary fantasy = storytelling alone and/or acting out a fantasy role
- 2 Collaborative fantasy = both children are storytelling and/or acting out fantasy roles while involved in social interaction
- 3 Fantasy aggression = aggression as part of fantasy, for example, pretending to have a ray gun battle while playing a space hero

C *Activity level*

- 1 = Inactive stationary
- 2 = Active stationary
- 3 = Moving through space slowly (walking pace)
- 4 = Moving through space rapidly (running pace)

D *Positive social interaction*

- 1 Verbal interaction = verbalization/vocalization to other child (includes laughing, storytelling, and other nonaggressive verbal/vocal communication to other child)

Time sampling was done by using 10-sec observing periods alternating with 10-sec recording periods Thus, there were 30 scored intervals for each 10-min play session Three raters scored several videotapes until a scorer reliability of 80% or better was achieved on each category Subsequent reliability checks yielded an average reliability of 80%

Attention

Videotapes of the children watching television were scored continuously for visual fix-

ation on the television monitor, using an Esterline-Angus event recorder. Four raters were trained to score attention by practicing on videotapes. A training criterion of 90% interobserver reliability was readily achieved. Subsequent reliability checks ranged from 87% to 94% and averaged 91% agreement between observers.

Results

Social Behavior

Analyses of covariance of sex \times formal features \times commercial placement \times pairs were performed on the social behavior variables listed in the outline above. Because "pairs" was a random variable, it contributed to the error terms for the other effects. The baseline score on each dependent variable served as the covariate for that variable; postviewing scores were used as dependent measures, as recommended by Huck and McLean (1975).

Aggression—Subjects viewing commercials with high salience formal features exhibited more acts of aggression than did those subjects viewing commercials with low salience formal features, $F(1,24) = 4.94$, $p < .05$. The pairs exposed to high salience features displayed an average of 6.25 acts of aggression per 10-min play session. Those viewing the low salience averaged 3.01 acts of aggression per play session.

There was a borderline interaction of sex \times formal features \times commercial placement, $F(1,24) = 3.84$, $p < .10$, for total aggression. The same interaction was significant for object aggression taken separately, $F(1,24) = 5.59$, $p < .05$. The means are shown in figure 1. Although the pattern of higher aggression after highly salient feature commercials held across sexes and commercial placements, it was most pronounced for boys who saw the clustered commercials.

Imaginative play—There were three categories of fantasy behavior: solitary fantasy, collaborative fantasy, and aggressive fantasy. Males had more incidents of solitary fantasy and aggressive fantasy than females, $F(1,24) = 7.03$, $p < .05$, $F(1,24) = 4.83$, $p < .05$, respectively. For solitary fantasy the interaction of sex \times commercial placement was significant, $F(1,24) = 4.61$, $p < .05$. The means are shown in figure 1. Girls engaged in more solitary fantasy after seeing clustered commercials than dispersed, but boys did not show that pattern.

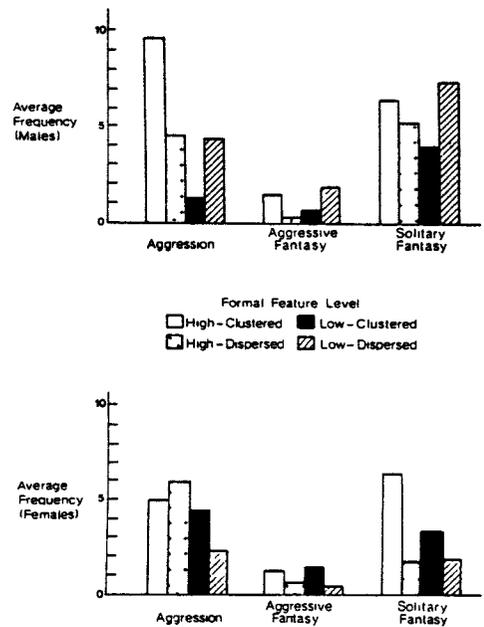


FIG 1—Aggression, aggressive fantasy, and solitary fantasy as a function of sex, formal feature salience, and commercial placement

Fantasy aggression followed a similar pattern. The three-way interaction of sex \times formal features \times commercial placement was significant, $F(1,24) = 4.93$, $p < .05$. The means are shown in figure 1. Girls' aggressive fantasy was higher in the clustered format than in the dispersed for both feature levels, for boys, that pattern held only for highly salient feature commercials. There were no effects of treatment or sex on activity level or prosocial behavior.

Attention

Analyses of variance were carried out for duration of attention in each 5-sec interval of each commercial. The between-subjects independent variables were sex, formal features, commercial placement, and pairs. Changes during commercials were evaluated by entering intervals within commercials as a within-subjects independent variable. All commercials were divided into 5-sec intervals to make 6 successive intervals. In a second analysis, changes across the 10 commercials were evaluated by entering commercials (10 levels) as a within-subjects variable. In both analyses, each of the 60-sec commercials was necessarily treated as two 30-sec commercials.

Changes within commercials—Commercials with high rates of salient formal features maintained children's attention across time in-

tervals better than commercials with low rates of salient features This pattern was particularly pronounced when commercials were dispersed through the television program In the analysis of 5-sec intervals, the interaction of formal features \times intervals was significant, $F(5,120) = 2.65, p < .05$, and the three-way interaction of formal features \times intervals \times commercial placement was significant, $F(5,120) = 2.50, p < .05$ The main effect of intervals was also significant, $F(5,120) = 5.55, p < .01$ The means are shown in figure 2 Attention was generally greater for high salience commercials than for low salience commercials, particularly when they were dispersed through the television program The differences were greater in the middle time intervals than the beginning and end, primarily because attention to low salience commercials dropped, whereas it remained at the same level or increased when high salience commercials were shown

Change across commercials—There was a significant interaction of formal features \times commercials, $F(9,216) = 3.65, p < .01$ It is

illustrated in figure 3 While children were generally more attentive to high salience commercials than to low salience commercials, there were variations in attention to different commercials within each formal feature classification These variations did not follow a temporal pattern, nor were they influenced by clustering of commercials Therefore, both form and content were examined as possible determinants of differences in attention to commercials For all 20 commercials, Spearman rank-order correlations were computed between mean level of attention and each of the form and content variables described earlier Rank-order correlations were used because the distributions of form were known to be nonnormal These correlations reflect the extent to which attention varied within as well as between treatment levels as a function of form and content The correlations of attention with the three form variables were action = .40, $p < .05$, pace = .28, N.S., visual change = .69, $p < .01$ A composite of form was created by summing ranks for the three form variables

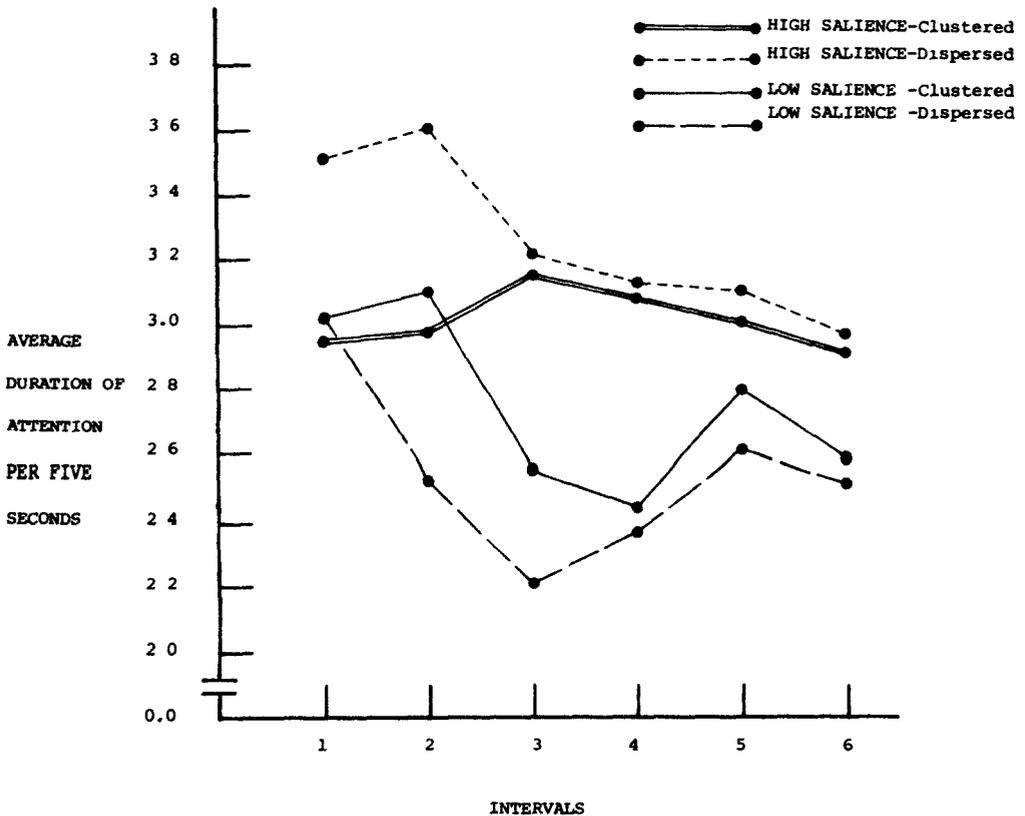


FIG 2—Visual attention to high and low salience commercials in clustered and dispersed formats, by 5-sec intervals

The Spearman r of composite form with attention was .55, $p < .01$. The correlations of attention with the three content variables were sex index = .30, NS, age index = .38, NS, product type = .40, $p < .05$. A composite of content was created by summing ranks for the three content variables. The Spearman r of composite content with attention was .33, NS. These correlational patterns indicate that formal features predicted attention within as well as between treatments. They suggest that the content differences among the commercials do not account for the differences in attention, either between or within treatments.

Sex differences—Males were more attentive than females, $F(1,24) = 12.55$, $p < .01$, particularly near the end of each commercial. There was a significant interaction of sex \times intervals, $F(5,120) = 5.84$, $p < .01$. Males' attention remained stable across intervals (means for intervals 1–6 were 3.42, 3.49, 3.46, 3.36, 3.48, 3.50). Females' attention decreased after the first 5 or 10 sec (means for intervals 1–6 were 2.77, 2.59, 2.09, 2.12, 2.27, 1.99).

Discussion

A major question asked in this study was how formal features and interruptions might influence social behavior of preschool children. Formal features were a significant determinant of the total amount of aggression exhibited. Children who viewed the high salience commercials were more aggressive than the groups viewing the low salience commercials. This result is consistent with our earlier finding that children who had seen high action programs, regardless of violent content, tended to be more aggressive than those who had seen low action programs or no television at all (Huston-Stem et al. 1981). In the present study, the highly salient formal feature commercials contained little or no violence. Increased aggression following exposure to television characterized by high action, high pace, and high levels of visual change supports the hypothesis that such features lead to generalized arousal which in turn increases the likelihood of aggressive behavior in a situation where there are cues for that kind of behavior. The arousal interpreta-

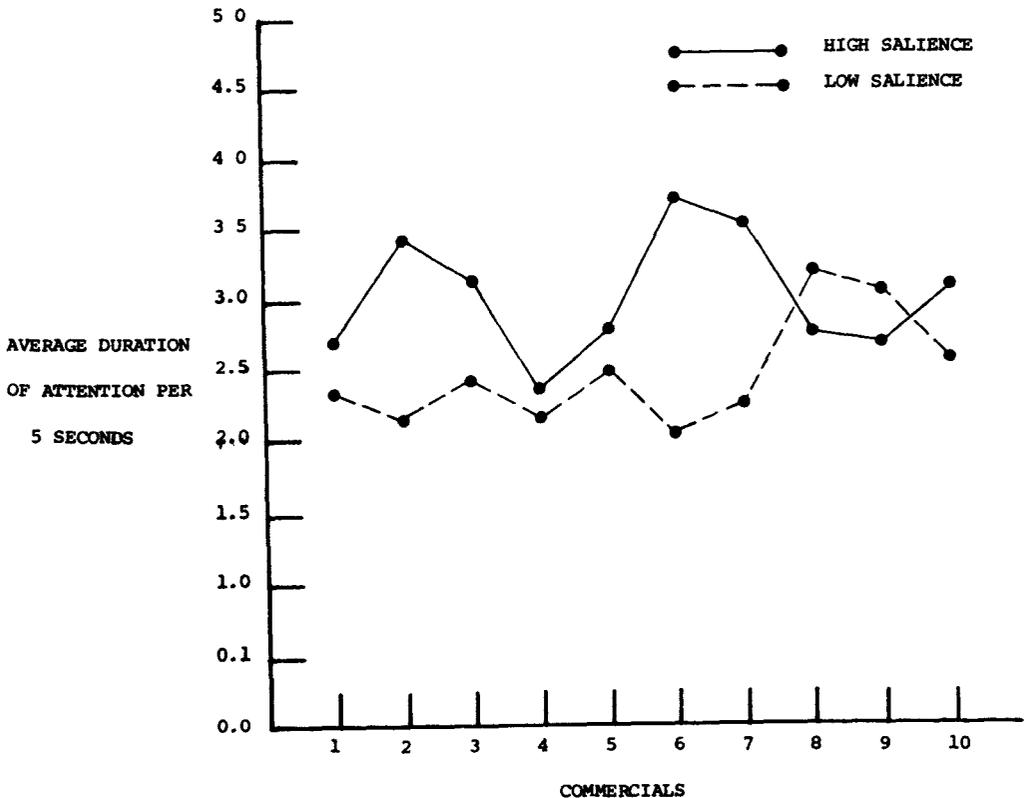


FIG 3—Mean duration of visual attention to high and low salience commercials by commercials in order shown

tion is further supported by the fact that aggression was particularly high following exposure to high salience commercials in the clustered format where several commercials were concentrated at the end of viewing immediately before the play session. The alternative hypothesis based on frustration is contradicted by this finding because frustration would be expected to occur more readily in the dispersed than in the clustered format. Another alternative hypothesis—that children were imitating the action and other formal features—received less support because there were no treatment effects on activity level. The most reasonable interpretation seems to be that high levels of the salient formal features used in commercials can be arousing to children and can lead to social behavior changes, including increases in aggressive behavior.

The finding that formal feature salience instigates aggression, even in the absence of violent content, does not indicate that violence is unimportant. Nor should one conclude that feature salience is more important than violence. Finally, these results cannot be automatically generalized to other types of programming, such as "Sesame Street," in which some perceptually salient features are used. If salient forms produce nonspecific arousal, then prosocial and educational content may direct behavior to quite different patterns from those observed in this study.

The influence of treatments on imaginative fantasy play was complex, but there was some tendency for fantasy to occur more after high salience than after low salience commercials, at least in the clustered format. This pattern contrasts with the earlier study (Huston-Stem et al. 1981) in which imaginative play was highest in the groups that saw no television or a low action-low violence program and lowest for the group that saw a high action-high violence program. The difference between the two studies may be attributed to differences in thematic content between programs and commercials or to slight differences in the categories of formal features used to select stimuli. Whatever the reason, no clear conclusions about effects on fantasy can be derived until further studies are carried out.

The other major purpose of the study was to test the effects of feature salience and clustering of commercials on children's visual attention. As expected, children generally attended to high salience commercials more than to low salience commercials. In particular, high salience maintained their attention throughout

the 30-sec commercial, but attention to low salience commercials dropped after the first 5 or 10 sec. While the high salience commercials differed from the low salience commercials on some content dimensions as well as on the formal features for which they were selected, content did not account for differences in attention. Although explanations based on content differences can never be excluded with certainty (there might be other content variables which we did not examine), it appears more reasonable to attribute condition differences in the present study to the planned differences in form than to unspecified content variations.

There were no overall effects of clustering versus dispersing commercials, but the high salience commercials were especially likely to maintain attention in the dispersed format. This pattern suggests that the change from program to commercial was attention getting when the commercial contrasted with the formal features of the program, and it confirms the prediction of dishabituating effects at the onset of bits having high perceptual salience. It neither supports nor refutes earlier findings about the effects of commercial clustering, but the reader will recall that those findings are contradictory. One reason for the lack of differences may be that the number of commercials shown together, even in the clustered format, was no greater than the number clustered in many real television broadcasts. Therefore, the range of the clustering variable sampled in the study may have been too small to have maximal effect. A second possibility is that the children found the commercials as interesting as the program, so were unlikely to drift away during a long series of commercials.

The sex difference in attention was not predicted, but the findings demonstrate that males were more attentive than females and that their attention was maintained throughout commercials better than that of females. This pattern may be an artifact of the distraction task available during viewing. A similar sex difference appeared in an earlier study of children's attention to cartoons in which drawing was the only available task, but there was no sex difference in a subsequent study where more play activities were available (Wright, Calvert, Huston-Stem, & Watkins, Note 1). In any case, there were no interactions of sex with experimental treatments, so the effects of feature salience and commercial clustering on attention cannot be attributed to variables related to gender.

The findings of this study support the prediction that perceptually salient formal features of television can be arousing to young children. Even in the absence of violent content, such features instigated aggressive behavior in free play. Similarly, commercials with highly salient features both elicited and maintained children's attention better than those with less salient features. Although attention to salient formal features of commercials was maximized in the dispersed format, behavioral effects were generally greater in the clustered format. Immediate changes in feature level may have gained momentary attention, but a concentration of features, especially at the end of the program, probably produced more lasting arousal than dispersal of those features throughout the program.

Reference Note

- 1 Wright, J C, Calvert, S L, Huston-Stein, A, & Watkins, B A Children's selective attention to television forms: effects of salient and informative production features as functions of age and viewing experience. Paper presented at the meeting of the International Communication Association, Acapulco, Mexico, May 1980

References

- Bandura, A, Ross, D, & Ross, S A Imitation of film-mediated aggressive models. *Journal of Abnormal and Social Psychology*, 1963, **66**, 3-11
- Berlyne, D E *Conflict, arousal, and curiosity*. New York: McGraw-Hill, 1960
- Bryant, J, & Zillman, D Effect of intensification of annoyance through unrelated residual excitation on substantially delayed hostile behavior. *Journal of Experimental Social Psychology*, 1979, **15**, 470-480
- Christy, P R, Gelfand, D M, & Hartmann, D P Effects of competition-induced frustration on two classes of modeled behavior. *Developmental Psychology*, 1971, **5**, 105-111
- Comstock, G, Chaffee, S, Katzman, N, McCombs, M, & Roberts, D *Television and human behavior*. New York: Columbia University Press, 1978
- Huck, S W, & McLean, A M Using a repeated measures ANOVA to analyze the data from a pretest-posttest design: a potentially confusing task. *Psychological Bulletin*, 1975, **82**, 511-518
- Huston, A C, Wright, J C, Wartella, E, Rice, M L, Watkins, B A, Campbell, T, & Potts, R Communicating more than content: formal features of children's television programs. *Journal of Communication*, 1981, **31** (3), 32-48
- Huston-Stein, A, Fox, A, Greer, D, Watkins, B A, & Whitaker, J The effects of action and violence in television programs on the social behavior and imaginative play of preschool children. *Journal of Genetic Psychology*, 1981, **138**, 183-191
- National Science Foundation Report *Research on the effects of television advertising on children: a review of the literature and recommendations for future research*. Washington, D C: Government Printing Office, 1977
- Rice, M L, Huston, A C, & Wright, J C The forms and codes of television: effects on children's attention, comprehension, and social behavior. In National Institute of Mental Health, *Television and behavior: ten years of scientific progress and implications for the 80's*. Washington, D C: Government Printing Office, in press
- Stein, A H, & Friedrich, L K The impact of television on children and youth. In E M Hetherington, J W Hagen, R Kron, & A H Stein (Eds.), *Review of child development research*. Vol 5. Chicago: University of Chicago Press, 1975
- Tannenbaum, P Studies in film and television mediated arousal and aggression: a progress report. In J P Murray, E A Rubinstein, & G A Comstock (Eds.), *Television and social behavior*. Vol 5. *Television's effects: further explorations*. Washington, D C: Government Printing Office, 1972
- Wartella, E, & Ettema, J A cognitive developmental study of children's attention to television commercials. *Communication Research*, 1974, **1**, 69-88
- Watt, J H, & Krull, R An information theory measure of television programming. *Communication Research*, 1974, **1**, 44-68
- Wright, J C, & Huston, A C The forms of television: nature and development of television literacy in children. In H Gardner & H Kelly (Eds.), *Children and the worlds of television* (New directions in child development). San Francisco: Jossey-Bass, in press
- Wright, J C, & Vlietstra, A The development of selective attention from perceptual exploration to logical search. In H W Reese (Ed.), *Advances in child development and behavior*. Vol 10. New York: Academic Press, 1975
- Zuckerman, P A, Ziegler, M E, & Stevenson, H W Children's viewing of television and recognition memory of commercials. *Child Development*, 1978, **49**, 96-104

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