

# Family Ecology and Child Characteristics That Predict Young Children's Educational Television Viewing

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PINON, MARITES F.; HUSTON, ALETHA C.; and WRIGHT, JOHN C. *Family Ecology and Child Characteristics That Predict Young Children's Educational Television Viewing*. CHILD DEVELOPMENT, 1989, 60, 846-856. This study investigated how sociological variables, program access, family attributes, and child characteristics influence children's viewing of the most well-established educational television program in the United States—"Sesame Street." 2 cohorts were followed from ages 3 to 5 and 5 to 7, respectively. Each family kept a diary of television viewed during 5 1-week periods over 2 years. Interviews and testing sessions were conducted before and after the 2-year period. "Sesame Street" viewing increased from age 3 to a peak between the ages of 3½ and 4; thereafter, viewing declined. This developmental change appeared to be a function of age-correlated life events and perceived age appropriateness of the program rather than of ontogenetic cognitive change. Individual differences were primarily a function of family ecology—opportunities to view and characteristics of other viewers—rather than of family demographics or individual child attributes. Maternal employment and the amount of time children attended child care or preschool were negatively related to viewing. The presence of older siblings reduced viewing; the presence of younger siblings increased it. Viewing was unrelated to parent education or occupational status, child gender, child's vocabulary level, involvement in television, or interest in print and other media. Parental encouragement to watch the program was positively related to viewing for 3-5-year-olds.

Research on children and television has been conducted largely from two perspectives. In the first, the medium has been examined to determine what effects, if any, television content has on learning or behavior. In the second, characteristics of the individual child have been examined as influences on how television messages are attended to, comprehended, or used. While each approach has made important contributions to our understanding of the roles of media in children's lives, they focus almost completely on the individual child viewer's cognitive sophistication, interests, and motivations. They rarely place that child in a larger social context. Moreover, we know a great deal about how children respond to television that is preselected for them, but much less about how and why they select particular programs in the natural settings where television is normally viewed.

In fact, most television use occurs in a broader context of family and community, and children's "choices" about what to view may be heavily influenced by the people and institutions that surround them. One means of conceptualizing the variety of influences on children's viewing is provided by Anderson and Bryant (1983, p. 333). In their model, television viewing behavior is placed in the context of the individual qualities of the child, the family environment, the sociological context, and the nature of available programs. The model indicates the dynamic interaction between behavior and ecological factors in that the child's viewing behavior influences and is in turn influenced by each of these environmental and sociological factors. It is consistent with ecological analyses of child development (Bronfenbrenner, 1979, 1986) which give explicit attention to the ways in which children's behavior is influenced by

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social systems within the family and by outside people and institutions such as peer groups, day-care settings, schools, and parents' workplaces.

The purpose of the study described in this article was to determine how the four types of variables specified by Anderson and Bryant (1983) are related to children's home viewing of one educational children's program: "Sesame Street." "Sesame Street" was chosen because it is the single most popular children's educational program and because its effectiveness in teaching basic skills is well documented. Two summative evaluations demonstrated that frequent viewers learned many of the skills the program was designed to teach (Ball & Bogatz, 1970; Bogatz & Ball, 1971). In a reanalysis of the evaluation data, Cook et al. (1975) reached the more modest conclusion that clear effects of the program alone (i.e., without encouraging mothers to promote the program) had been demonstrated only for some letter, number, and relations skills.

#### *Sociological Characteristics*

Parents' education and occupational status are demographic indices that serve as indirect indicators of neighborhood and community as well as of parental behavior. In general, education and occupational status are negatively related to the total amount of television viewed by both children and parents (Comstock, Chaffee, Katzman, McCombs, & Roberts, 1978), but the amount of children's programming viewed does not follow that pattern (Friedrich & Stein, 1973). In fact, in the first year or two that "Sesame Street" was available, economically advantaged children watched it more often than disadvantaged children (Ball & Bogatz, 1970). The program was criticized for increasing the knowledge gap between advantaged and disadvantaged children (Cook et al., 1975). The differences among economic groups may have disappeared, however, as the program became more familiar to people of all economic levels and as it became more universally available on regular broadcast television (as opposed to cable or UHF) than it was in 1968-1970. One would predict that parental education or occupational status would have a minimal direct influence on children's viewing of "Sesame Street."

The family's involvement in institutions outside the home, particularly school and work, is a potentially important influence on children's television use. Parents' employment and children's day-care and school ex-

periences, for example, determine the amount and the scheduling of time at home. As most television viewing occurs at home, these features of people's lives may affect when and how often television is used. Entry into public school is associated with a slight decline in total television viewed, probably because of reduced hours of opportunity (Comstock et al., 1978).

For elementary school children, there is no relation between maternal employment and total amount of television viewed (Messaris & Hornik, 1983), probably because school attendance, which directly limits home viewing opportunity, is not dependent on parents' activities. However, preschool children must have alternative care, often away from home, when their mothers are employed. Therefore, viewing programs broadcast during weekdays might well be influenced by the amount of time children spend in child care.

#### *Availability of Programs*

The institutions responsible for television broadcasting and distribution set boundary conditions on viewing by determining what is available to watch and when. In many communities, children in child care have less access to "Sesame Street" than those in the present study because the program is typically broadcast earlier than the 5:00-6:00 hour that is occupied on the Topeka station. In the present study, "Sesame Street" was available on a VHF channel (11) that could be received without cable in most parts of the city. The cable system provided alternative children's programming, including cartoons on independent channels, that could compete with "Sesame Street" for the child audience.

#### *Family Characteristics*

*Siblings.*—Children often watch television with parents and siblings; therefore, the age and preferences of those individuals are likely to affect the programs chosen. Older members of a family, including older children, exercise more power over program selection than younger children (Lull, 1978). Older siblings also serve as models for their younger brothers and sisters (Dunn, 1983); younger children may imitate the program preferences of their older siblings even when the older children are not present. At the same time, covieving with older siblings can promote the elaboration of program elements, presenting the opportunity for comprehension and learning (Alexander, Ryan, & Munoz, 1984).

Older children's evaluations of programs often set the context for younger children. In observations of sibling pairs, a program evaluated by an older sibling as inappropriate (e.g., "for dummies") was eventually evaluated as such by the younger sibling, and the channel was changed (Alexander et al., 1984). In interviews with children, programs such as "Captain Kangaroo" and "Romper Room" were disliked by children older than 6 because they were "babyish" (Streicher & Bonney, 1974). Because "Sesame Street" is designed primarily for a preschool audience, siblings over 5 or 6 may discourage viewing and preschool-age siblings (usually younger) may encourage viewing.

*Parent attitudes and encouragement.*— In the first 2 years that "Sesame Street" was broadcast, experimental groups of mothers were encouraged to have their children watch the program. Children of these mothers watched more and showed greater gains in learning than the control group (Ball & Bogatz, 1970; Bogatz & Ball, 1971). However, there have not been further studies assessing the influence of parents' attitudes and encouragement on children's viewing patterns.

#### *Individual Child Attributes*

A large body of research on individual differences in viewing has been focused primarily on age and cognitive developmental changes as they influence attention and comprehension. Two theories predict a curvilinear relation between content difficulty and children's interest (Anderson & Lorch, 1983; Huston & Wright, in press). Attention and interest are expected to be maximized when content is moderately understandable and familiar; interest will wane when material is extremely easy and redundant or extremely difficult and unfamiliar. Of course, content difficulty or comprehensibility is also a function of the individual's level of knowledge and cognitive competence, both of which increase with age.

Because "Sesame Street" is designed for 3-5-year-olds, children might be expected to reach a level of moderate comprehension and familiarity with the program during that age period; as they get older, the program may become increasingly easy and redundant, with a consequent reduction in interest. In the present study, children were followed from ages 3 to 5 or 5 to 7 to examine age changes in viewing.

Although age changes are often attributed to cognitive developmental changes, they can also result from age-correlated expe-

riences such as school entry. Therefore, measures of cognitive functioning (vocabulary level) and life events (school experience) were included in the present study.

In summary, the relations of four classes of variables to children's educational television use were evaluated in the present study. The purpose was to shed light on the relative importance of ontogenetic development and environmental contexts for children's use of an important resource for early learning.

## Method

### *Subjects*

Children were participants in a 2-year longitudinal study of young children's home television viewing. The initial sample consisted of 326 children in Topeka, Kansas, a city with a heterogeneous population of about 115,000 people. Children were within 3 months of their third birthday (Cohort 1,  $N = 160$ ) or fifth birthday (Cohort 2,  $N = 166$ ) at the beginning of the study. Within each cohort, two subcohorts (start time groups) were formed. Children whose birthdays were between January 1 and August 31 began the study in the spring, 1981. Children whose birthdays were between September 1 and February 28 began in the fall, 1981. September 1 is the local cut-off date for school entry. The two cohorts were followed from ages 3 to 5, and 5 to 7, respectively.

The sample was predominantly Caucasian, and all but 18 families had both parents living in the home. Recruited from birth records and advertisements, the sample represented a wide range of parent educational and occupational levels.

### *Design*

The design of the longitudinal study is summarized in Table 1. It incorporates some of the advantages of a cohort-sequential design, primarily the possibility of examining age effects independently of cohort and time of measurement. It balances the fluctuations between spring and fall seasons within age groups so that age effects can be separated from seasonal variations; half of each cohort was first and last measured in the spring, the other half in the fall.

### *Home Viewing*

Viewing was assessed from diaries maintained by the parents for 1 week in the spring and 1 week in the fall for 2 years (a total of five diaries). Viewing by all family members was recorded in 15-min intervals from 6:00 A.M. to 2 A.M. for each day. Spring and fall were sampled to avoid the extremes of heavy

TABLE 1  
DESIGN OF LONGITUDINAL STUDY

BIRTH COHORT AND START TIME	TIME OF MEASUREMENT					
	1981		1982		1983	
	Spring	Fall	Spring	Fall	Spring	Fall
1978, Spring	Wave 1 (3)	Wave 2 (3½)	Wave 3 (4)	Wave 4 (4½)	Wave 5 (5)	...
1978, Fall	...	Wave 1 (3)	Wave 2 (3½)	Wave 3 (4)	Wave 4 (4½)	Wave 5 (5)
1976, Spring	Wave 1 (5)	Wave 2 (5½ <sup>a</sup> )	Wave 3 (6)	Wave 4 (6½ <sup>b</sup> )	Wave 5 (7)	...
1976, Fall	...	Wave 1 (5)	Wave 2 (5½)	Wave 3 (6 <sup>c</sup> )	Wave 4 (6½)	Wave 5 (7 <sup>d</sup> )

NOTE.—Numbers in parentheses are ages (in years).

<sup>a</sup> Spring children entered kindergarten.

<sup>b</sup> Spring children entered first grade.

<sup>c</sup> Fall children entered kindergarten.

<sup>d</sup> Fall children entered first grade.

viewing in winter or light viewing in summer. Parents were paid \$10.00 upon completion of each diary.

Parents were instructed to record as a "viewer" anyone who was present for more than half of a 15-min interval in which the television was turned on. While children may have been inattentive on some of these occasions, this definition removed the necessity for subjective judgments by the mother about when the child was "watching." A recent investigation by Anderson, Field, Collins, Lorch, and Nathan (1985) provides evidence for the validity of diaries by comparing parents' diary reports with videotapes made in the home during viewing. The correlation between the two methods was .84 for preschoolers, and the total number of hours reported by the two methods were similar. Diaries slightly but consistently overestimated children's viewing time.

A total of 271 subjects returned four ( $N = 27$ ) or five ( $N = 244$ ) diaries and were, therefore, considered to have sufficient data for analyses of viewing. Families who were retained did not differ from those who were dropped on demographic attributes or numerous variables assessed in an initial home interview. Children whose parents returned more diaries did perform slightly better than the low return rate groups on the Peabody Picture Vocabulary Test—Revised (PPVT-R),  $r(324) = .16$ ,  $p < .05$ . The frequencies of viewing were positively skewed, so viewing data were normalized using a square root transformation of the raw viewing data. For the 27 children with one missing diary, view-

ing was estimated using the BMDP least-squares procedures for estimation of missing data. Estimated data constituted about 2% of the total viewing data.

#### Predictors of Viewing

All measures were drawn from a home interview with a parent, usually the mother, prior to the first viewing diary. The child was given a PPVT-R (Dunn & Dunn, 1981). Descriptive information about these measures appears in Table 2.

#### Sociological Variables

The highest level of *education* attained by each parent was coded on a 6-point scale in which 1 = less than high school, 2 = high school, 3 = some post-high school training, 4 = Bachelor's degree, 5 = some post-college training, and 6 = graduate or professional degree. The parents' scores were averaged to obtain an overall parent score. The *occupational status* (parent SES) of each parent's current or most recent occupation was coded on the Duncan Scale (range 1–99) assessing occupational prestige (Duncan, 1961).

*Maternal employment* outside the home was coded as full time (3), part time (2), or none (1). Children's *child-care attendance* was coded as the number of hours per week that the child regularly attended preschool or day-care away from home.

#### Program Availability

*Cable availability* was coded at four levels: no cable (broadcast television only), basic cable (including independent channels from outside the broadcast area and special interest channels but not "Nickelodeon"), ba-

TABLE 2  
DESCRIPTIVE STATISTICS OF PREDICTORS BY COHORT

PREDICTORS	COHORT 1 (n = 141) (Age 3)		COHORT 2 (n = 145) (Age 5)	
	Mean	SD	Mean	SD
Parent education (1-6) .....	3.56	1.07	3.54	1.14
Parent occupational status (1-99) .....	52.76	24.20	53.88	22.53
Maternal employment (1-3) .....	1.94	.78	1.87	.79
Hours per week in child care .....	12.94	18.04	12.44	15.35
Cable status (0-3) .....	.90	.98	.97	.98
Proportion of subjects with younger siblings .....	.30	.46	.52	.50
Proportion of subjects with older siblings ...	.59	.49	.57	.50
PPVT-R .....	105.38	15.33	107.71	12.98
TV focus .....	29.59	7.22	35.51	6.28
Likes print .....	15.28	2.90	15.99	2.82
Likes other media .....	5.82	1.26	6.36	.90
Proportion whose parents encourage "Sesame Street" .....	.52	.50	.42	.50
Early viewing of "Sesame Street" .....	6.75	3.14	5.15	2.63

sic cable plus one pay movie channel (usually HBO), basic cable plus two or more pay movie channels (HBO and Cinemax—a few families had begun to receive the Disney Channel in the last diary of the study).

#### Family Characteristics

*Sibling structure* was coded as the presence or absence of older and/or younger siblings in the home. *Parent encouragement of "Sesame Street"* was determined from an interview item in which parents were asked if they encouraged children to watch any television programs. If they responded positively, they were asked what programs. Those who named "Sesame Street" were coded as encouraging viewing.

#### Child Characteristics

In addition to *age*, *gender*, and *PPVT-R* standard score, two types of parent ratings of children's media interests were obtained. *TV focus* was a summary score based on 11 Likert-type items designed to assess how often the child talked or asked questions about television, or used television characters and themes in play. A sample item is, "How often does your child act out TV themes with other children?" The parent responded to each item on a 5-point scale ranging from 1 = never to 5 = very often. The Cronbach alpha for the scale was .82.

*Children's interest in print and other media* was measured from parents' ratings on a 5-point scale of their children's enjoyment of books, magazines, comic books, records, tapes, and radio. They also reported how of-

ten the child visited the library. Two scales were formed: *likes print*, based on enjoyment of print media and frequency of library visits, and *likes other media*, based on enjoyment of the remaining media.

## Results

### Developmental Changes in Viewing

"Sesame Street" viewing increased steadily among the younger cohort until it peaked at ages 3½ and 4, then there was a relatively steady decline with the lowest level at age 7. The means are shown in Figure 1. An analysis of variance of viewing frequency, with wave (5) as a repeated measure and sex (2), cohort (2), and start time (2) as the between-groups variables, showed a significant cohort × start time × wave interaction,  $F(4,1048) = 2.82, p < .05$ .

Orthogonal polynomial contrasts and planned comparisons were performed. There was a significant quartic component for the cohort × start time × wave interaction,  $F(1,262) = 11.19, p < .001$ . The quartic trend reflects the fact that viewing changed differentially across time for both cohorts: the younger cohort viewed more than the older cohort and had a sharp inflection in the pattern of viewing. The older cohort showed a fairly steady decline marked by an inflection at wave 3. The pattern within cohorts is complicated by viewing differences in start times, suggesting different time of measurement effects for the two cohorts that may in part be due to the timing of school entry. In the older

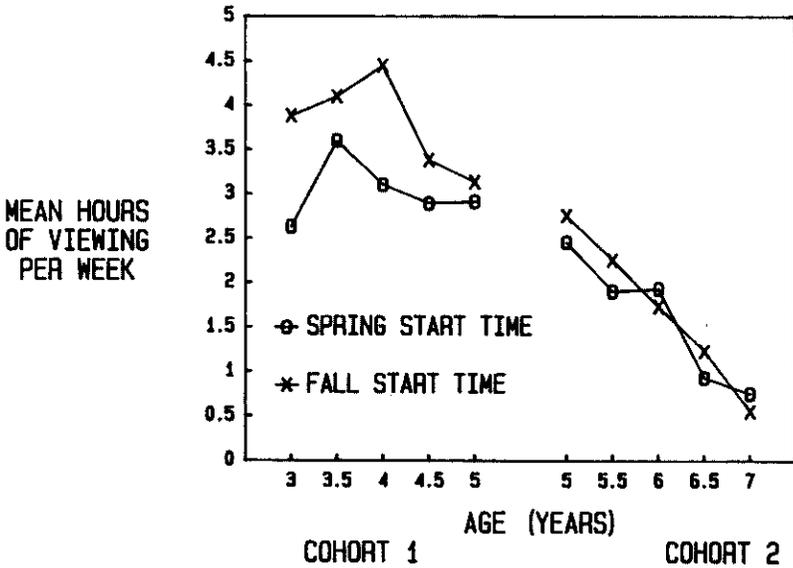


FIG. 1.—Amount of "Sesame Street" viewing by age, cohort, and start time

cohort, children in the spring start time group entered school when they were 6 months younger than the fall start time group because the cut-off date for school admission was September 1. Planned comparisons revealed a significant drop in viewing at school entry points. The younger cohort was more likely to be in organized preschool at age 5 than at 3, with a significant correlation between time spent in preschool and start time,  $r(122) = -.18, p < .05$ , indicating the spring start time group spent more time in preschool than the fall start time group during the final year of the study. There were no significant gender differences in viewing.

#### Predictors of Viewing

Sociological variables, program availability, family attributes, and child characteristics were examined in multiple regressions predicting "Sesame Street" viewing at different ages. The predictors were mean parent education, parents' occupational status, maternal employment, child's time in child care, cable availability in the home, presence of older siblings, presence of younger siblings, parent encouragement of "Sesame Street," PPVT-R standard score, child's TV focus, child's liking for print, and child's liking for other media. Stepwise solutions were used.

The dependent variables were frequency of viewing during the first and second years of the study for each cohort. In order to compensate for seasonal effects, and to provide a stable measure of viewing, "Sesame Street" viewing from waves 1 and 2 were combined

as a measure of early viewing. The correlations between the two waves were .59 and .34 for cohorts 1 and 2, respectively. Waves 4 and 5 were combined as a measure of later viewing. Their correlations were .60 and .55 for cohorts 1 and 2, respectively. The zero-order correlations of all predictors with early and late viewing appear in Table 3.

*Early viewing.*—The results of the regressions predicting viewing in Waves 1 and 2 are shown in Table 4. For both cohorts, time spent in child care was negatively related to viewing. The zero-order correlations shown in Table 3 help to elucidate this pattern. Maternal employment was also negatively correlated with viewing. For these young children, maternal employment was highly related to time in child care,  $r(158) = .63, p < .001$ , for Cohort 1 and  $r(164) = .64, p < .001$ , for Cohort 2. Time in child care accounted for their shared variance in the regression. At ages 3 and 5, children whose mothers are employed spend time away from home during the hours "Sesame Street" is broadcast and therefore watch it less than children who are home most of the time.

Sibling structure was the other major predictor. For Cohort 1 (ages 3 to 3½), the presence of an older sibling was associated with low viewing. For Cohort 2 (ages 5 to 5½), having a younger sibling was associated with relatively high viewing frequencies. No other variables accounted for significant amounts of variance in the regressions. Parental encouragement of "Sesame Street" was positively

TABLE 3  
ZERO-ORDER CORRELATIONS OF PREDICTORS WITH "SESAME STREET" VIEWING

PREDICTORS	EARLY VIEWING <sup>a</sup>		LATER VIEWING	
	3-3½ (n = 141)	5-5½ (n = 145)	4½-5 (n = 131)	6½-7 (n = 132)
Parent education	.02	-.03	.09	.12
Parent SES	-.01	.03	.13	.00
Maternal employment	-.20*	-.17*	-.27*	-.04
Time in child care	-.25*	-.28*	-.35*	-.10
Younger siblings	.16*	.22*	.15	.16*
Older siblings	-.16*	-.04	-.27*	-.19*
PPVT-R	.14	.07	.18*	-.01
TV focus	.06	.09	-.04	.06
Like print	.09	.03	.00	.00
Like other media	-.08	-.10	-.08	.07
Encourage "Sesame Street" viewing	.16*	.09	.25*	.04
Sex	.05	.04	.08	-.07
Cable status	-.05	-.15*	-.14	-.10
Early "Sesame Street" viewing	1.00	1.00	.47*	.40*

<sup>a</sup> Columns within each viewing category describe correlations for Cohorts 1 and 2, respectively.

\*  $p < .05$ .

related to viewing, but its independent contribution to the multiple regression was not significant ( $\beta = .14$ ,  $t = 1.71$ ).

*Later viewing.*—Multiple regressions were performed on the viewing frequencies in the second year to identify those variables that predicted changes in viewing over 2 years. After entering initial "Sesame Street" viewing (waves 1 and 2), variables were entered in a stepwise regression analysis of the residual variance in later viewing (waves 4 and 5). The results are summarized in Table 5.

For the younger cohort, the time spent in child care was negatively related to viewing

at age 4½ to 5; the older cohort was in elementary school, so child-care experience was no longer relevant to viewing. For both cohorts, the presence of an older sibling was associated with low viewing frequencies. Children with older siblings declined in viewing during the 2 years of the study more than would have been predicted on the basis of their initial viewing frequencies. Parental encouragement of "Sesame Street" at age 3 was positively related to viewing at ages 4½ to 5 for the younger cohort. Despite the fact that vocabulary level was significantly correlated with viewing at ages 4½ to 5, the variables given in Table 5 were the strongest predictors of "Sesame Street" viewing, ac-

TABLE 4  
PREDICTORS OF EARLY "SESAME STREET" VIEWING

VARIABLES	SUMMARY TABLE			
	Overall Values		Individual Values	
	R <sup>2</sup>	F	Beta	t
Cohort 1 (n = 141):				
Time in preschool	...	...	-.25	-3.33**
Older siblings	.10	7.51***	-.20	-2.40*
Cohort 2 (n = 145):				
Time in preschool	...	...	-.28	-2.91**
Younger siblings	.10	8.04***	.17	2.03*

NOTE.—Overall values are based on multiple  $r^2$  and significance test for the total equation.

\*  $p < .01$ .

\*\*  $p < .05$ .

\*\*\*  $p < .001$ .

TABLE 5  
 PREDICTORS OF LATE "SESAME STREET" VIEWING

VARIABLES	SUMMARY TABLE			
	Overall Values		Individual Values	
	R <sup>2</sup>	F	Beta	t
Cohort 1 (n = 131):				
Early "Sesame Street" viewing (waves 1 + 2) .....	...	...	.47	4.18***
Time in preschool .....	...	...	-.25	-3.73***
Older siblings .....	...	...	-.24	-3.35**
Parents encourage "Sesame Street" .....	.36	17.34***	.16	2.18*
Cohort 2 (n = 132):				
Early "Sesame Street" viewing (waves 1 + 2) .....	...	...	.40	5.08***
Older siblings .....	.20	15.80***	-.19	-2.43*

NOTE.—Overall values are based on multiple  $r^2$  and significance test for the total equation.

\*  $p < .01$ .

\*\*  $p < .05$ .

\*\*\*  $p < .001$ .

counting for a significant portion of the variance in viewing.

#### Comparisons with Other Viewing Categories

Although the major emphasis of this analysis was "Sesame Street," viewing of two other types of programs—children's entertainment (largely cartoons) and general audience entertainment (comedies, dramas, action adventure, variety, and game shows)—was examined to determine whether the findings were specific to "Sesame Street" or were general for most television viewing. The correlations between frequency of viewing "Sesame Street" and child entertainment ranged from .17 to .23; for adult entertainment, they ranged from  $-.01$  to .16. Moreover, the development patterns for other program types were quite different than that for "Sesame Street" (Huston, Wright, Rice, Kerkman, & St. Peters, 1987). Second, the principal predictors for entertainment programs were demographic characteristics (low parent education and occupational status), parent attitudes, and child gender. Viewing was not predicted by time in preschool, maternal employment, siblings, or parent encouragement of "Sesame Street."

#### Discussion

"Sesame Street" was one of the most popular programs during the 2-year study. It accounted for 18.1% of 3-year-olds' overall viewing, 12.2% of 5-year-olds' viewing, and 5.5% of 7-year-olds' viewing. At the ages of peak viewing, the average child watched ap-

proximately 4 hours a week; even at age 7, the average was over 30 min a week.

The most important determinants of individual differences in viewing within age groups were the structure of the family and its relation to outside institutions such as school and work. Individual attributes of children (except age), socioeconomic status, and attitudes of parents were relatively unimportant in differentiating heavy viewers from lighter viewers.

Viewing was highest between ages 3 and 5, the target age for the program, with a peak between 3½ and 4. It declined from 5 to 7. This pattern is consistent with the proposal that attention and interest will follow a curvilinear pattern, rising as material moves into the child's range of understanding, then dropping as it becomes too easy or repetitive (Anderson & Lorch, 1983; Huston & Wright, in press). However, life events and environmental variables appear to account for the observed age changes better than children's cognitive levels. It is unlikely that children as young as 4 have reached the point that the content of "Sesame Street" is too easy or redundant. The fact that children with high PPVT-R scores watched slightly more than those with low scores, even at age 5, also contradicts an explanation based solely on the notion that the program was becoming too easy. According to that hypothesis, brighter children should reach the point of maximum interest earlier than slower children.

## 854 Child Development

Developmental change may have resulted partly from age-correlated events, particularly school entry. For the older cohort, there were steeper drops in viewing when children entered kindergarten and first grade than at other times. Even before children entered kindergarten, however, increasing numbers attended preschool or child care, experiences that led to reduced viewing largely because children were away from home during the daytime hours when the program is broadcast.

Children may also perceive the program as appropriate for young children and begin to reject it as babyish when they have mastered the most basic and obvious content presented—the alphabet and numbers from 1 to 20. Informal interviews with 6-year-old children supported the notion that they considered the content appropriate for younger children (Huston et al., 1985). Finally, as children get older, alternative programs may have greater appeal, either because children can understand a wider variety of content or because such programs are perceived as age-appropriate.

The major predictors of individual differences in viewing within age groups were sociological variables—the family's participation in school and work—and family structure. Children's school attendance and mothers' employment reduced viewing indirectly by their effects on opportunity to view. For the most part, children who were in out-of-home child care watched less educational television than those at home. (Records of viewing in child care were included in viewing data.) This finding contradicts the stereotype that maternal employment leads to heavy television viewing among children—quite the opposite occurs for young children. It also suggests that "Sesame Street" is serving children who do not have the educational benefits of preschool.

With an increasing number of mothers entering the workforce, larger numbers of preschoolers are spending the day in alternative care settings away from home. Television viewing is not encouraged in most preschools and child-care centers (Pinon, Wright, & Huston, 1986). In most communities, the program is typically broadcast within the hours children are in school or child-care settings away from home. If educational television for children is to be used effectively, program planners must do more than make the program comprehensible and entertaining; they may also need to schedule the program when chil-

dren are most likely to be watching television at home.

Family structure, specifically the presence of older or younger siblings, also has a considerable impact on children's viewing. Having younger siblings increases the likelihood of viewing; having older siblings decreases it. Much of children's television viewing occurs in the company of siblings. The program choices of a group of siblings can be conceived as a rough average of the preferences of the group members. Younger siblings weight the group average toward "Sesame Street" because its maximum appeal occurs in the early part of the age range studied. Older siblings probably exert power to select alternative programs, and they may tease or criticize a younger child for watching a "little kids' program." One result of these sibling influences is that children with younger siblings, many of whom are firstborn, get more exposure to the educational benefits of the program than later-born children. Educational television is probably not a major reason for birth-order differences in vocabulary and school-related skills, but it may contribute to them.

Socioeconomic indices—parents' education and occupational status—were unrelated to viewing. The sample included a wide range of educational and occupational levels, but the very lowest levels were underrepresented. Nevertheless, within the broad range characterizing much of the U.S. population, it is no longer the case that economically advantaged children watch more than less advantaged children. Over the years, "Sesame Street" has become sufficiently familiar that it is used by a wide cross-section of the population. Only one family characteristic, parental encouragement to view the program, was associated with high viewing.

Individual characteristics of children (other than age) were unrelated to the amount viewed. There were no significant differences associated with gender, vocabulary level, interest in television, interest in print, or interest in other media. Individual preferences of children appear to carry relatively little weight in comparison to external environmental influences for determining the amount of exposure to "Sesame Street."

One reason for the relatively large contribution of family ecological variables and the small contribution of individual characteristics may be the method of measuring viewing. Diaries assess the time spent in a room where

the television was turned on; they do not describe attention to the program being shown. Filmed observations of home viewing have demonstrated relatively low correlations between total time spent with television (undifferentiated by program type) and percent of time attending when it is viewed (Anderson, Lorch, Field, Collins, & Nathan, 1986). Individual differences might affect attention more than they affect exposure. Nevertheless, exposure is an important descriptor of children's experience with television. A child who is not exposed cannot attend; a child who is in the room with the program may glean information from it even during periods when she is looking elsewhere.

These findings illustrate the usefulness of an ecological framework encompassing the family and the social institutions affecting the family for understanding naturally occurring behavior. Children's viewing of "Sesame Street" was more a function of the ecology of the home environment than of individual child attributes. Program access was affected by how the family structured the child's time and television environment; these were in turn heavily influenced by the mother's participation in the workforce and the child's participation in child care and school. Viewing choices were further delimited by the presence of older and younger siblings. Children's environments can affect how much they view and, as a result, perhaps how much they benefit from educational television.

## References

- Alexander, A., Ryan, M. S., & Munoz, P. (1984). Creating a learning context: Investigations on the interaction of siblings during television viewing. *Critical Studies in Mass Communication*, 1, 345-364.
- Anderson, D. R., & Bryant, J. (1983). Research on children's television viewing: The state of the art. In J. Bryant & D. R. Anderson (Eds.), *Children's understanding of television: Research on attention and comprehension* (pp. 331-353). New York: Academic Press.
- Anderson, D. R., Field, D. E., Collins, P. A., Lorch, E. P., & Nathan, J. G. (1985). Estimates of young children's time with television: A methodological comparison of parent responses with time-lapse video home observations. *Child Development*, 56, 1345-1357.
- Anderson, D. R., & Lorch, E. P. (1983). Looking at television: Action or reaction? In J. Bryant & D. R. Anderson (Eds.), *Children's understanding of television* (pp. 1-33). New York: Academic Press.
- Anderson, D. R., Lorch, E. P., Field, D. E., Collins, P. A., & Nathan, J. G. (1986). Television viewing at home: Age trends in visual attention and time with TV. *Child Development*, 57, 1024-1033.
- Ball, S., & Bogatz, G. A. (1970). *The first year of "Sesame Street": An evaluation*. Princeton, NJ: Educational Testing Service.
- Bogatz, G. A., & Ball, S. (1971). *The second year of "Sesame Street": A continuing evaluation*. Princeton, NJ: Educational Testing Service.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.
- Bronfenbrenner, U. (1986). Ecology of the family as a context for human development: Research perspectives. *Developmental Psychology*, 22, 723-742.
- Comstock, G., Chaffee, S., Katzman, N., McCombs, M., & Roberts, D. (1978). *Television and human behavior*. New York: Columbia University Press.
- Cook, T. D., Appleton, H., Conner, R., Shaffer, A., Tamkin, G., & Weber, S. J. (1975). *"Sesame Street" revisited*. New York: Russell Sage.
- Duncan, O. D. (1961). A socioeconomic index for all occupations. In A. J. Reiss (Ed.), *Occupations and social status* (pp. 109-138). Glencoe, IL: Free Press.
- Dunn, J. (1983). Sibling relationships in early childhood. *Child Development*, 54, 787-811.
- Dunn, L. M., & Dunn, L. M. (1981). *The Peabody Picture Vocabulary Test* (revised). Circle Pines, MN: American Guidance Service.
- Friedrich, L. K., & Stein, A. H. (1973). Aggressive and prosocial television programs and the natural behavior of preschool children. *Monographs of the Society for Research in Child Development*, 38(4, Serial No. 151).
- Huston, A. C., & Wright, J. C. (in press). The forms of television and the child viewer. In G. A. Comstock (Ed.), *Public communication and behavior*. Vol. 2. New York: Academic Press.
- Huston, A. C., Wright, J. C., Eakins, D., Kerkman, D., Pinon, M., Rosenkoetter, L., & Truglio, R. (1985). *Age changes in Sesame Street viewing: A report to Children's Television Workshop*. Lawrence: University of Kansas, Center for Research on the Influences of Television on Children.
- Huston, A. C., Wright, J. C., Rice, M. L., Kerkman, D., & St. Peters, M. (1987, April). *The development of television viewing patterns in early childhood: A longitudinal investigation*. Paper presented at the meeting of the Society for Research in Child Development, Baltimore, MD.
- Lull, J. (1978). Choosing television programs by family vote. *Communication Quarterly*, 26, 53-57.

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- Messaris, P., & Hornik, R. C. (1983). Work status, television exposure, and educational outcomes. In C. D. Hayes & S. B. Kamerman (Eds.), *Children of working parents: Experiences and outcomes* (pp. 44-72). Washington, DC: National Academy Press.
- Pinon, M. F., Wright, J. C., & Huston, A. C. (1986, March). *Child care providers' uses and views of television*. Paper presented at the biennial meeting of the Southwestern Society for Research in Human Development, San Antonio, TX.
- Streicher, L. H., & Bonney, N. L. (1974). Children talk about television. *Journal of Communication*, *24*, 54-61.

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