Throughout each period, approximately every two months each family completed a telephone interview. The calls served to keep track of the families and remind them of our interest, and to track any changes in family composition, living arrangements, child-care, and the like. But the main purpose of the telephone interviews was to record a complete diary of everything the child did on the previous day. These diaries were distributed uniformly over the days of the week and were also collected on the occasions of office visits and home visits.

Four basic types of data were used to generate the present report. One was television viewing, about which information came from the time-use diaries. Viewing data (minutes per day) were categorized by type of program (see below). Primary viewing (mainly watching TV but also doing something else) was distinguished from secondary viewing (mainly doing something else in a room where the TV was turned on).

The second type of data was time spent in other activities, such as reading and being read to; educational activities like art, music, or preacademic learning tasks; or playing with video games like Nintendo or Sega.

The third type of data included family demographics and home environment. The former was assessed as a part of the interview at each office visit. The family's home environment was assessed by a two-hour home visit in each wave, during which the visitor used an instrument for observation, interview, and scoring called the HOME, or Home Observation Measure of the Environment (Caldwell & Bradley, 1984). This standard instrument is widely used because it provides a measure of the degree to which the child's home environment provides stimulation and support for cognitive and educational development and a mentally and emotionally healthy context for the child to grow up in.

The fourth type of data included the outcome measures, comprised by standard achievement tests of letter and word recognition, number skills, vocabulary size, school readiness, and (for those who were beginning to read) paragraph comprehension. Preschool, kindergarten, and elementary school teachers completed a questionnaire about each child's school adjustment.

Time and Media Use

Time Use Diary

For purposes of future structural model testing there was more than one measure of each critical variable, including television viewing. In this initial report, the time-use diary measures are the ones used for prediction. In the telephone interviews and at each office

and home visit, the parent (typically the mother) was interviewed about the child's activities on the previous day. Weekend viewing was assessed on Mondays. The parent described the child's activities from waking to sleeping, including for each activity reported, who else was present. If the child was watching television or the television was on in the same room, the name and type of program being viewed was recorded. The interview was patterned after time use diaries used extensively at the University of Michigan (Juster & Stafford, 1985). The average number of 24-hour diaries per child was 3.3 in period 1, 4.4 in period 2, and 5.1 in period 3.

Activities while the TV was on, including viewing, were classified as primary or secondary. The first activity named by the parent was primary. If the child was simultaneously doing something else, that activity was secondary. For example, if the parent said the child was playing and also watching television, then play was recorded as primary, and the TV viewing as secondary. If the child was "watching television while she ate lunch," then the reverse was the case. If children spent part or all of the day away from the parent (e.g., in child care), the adult in charge was also called to get time use information for that portion of the day.

Classification of Programs Viewed

All programs viewed were first classified by the intended audience (made for children or for general adult audiences). Child programs were further grouped as (1) informative or educational programs (regardless of animation), (2) fully animated cartoons with no informative purpose, (3) other children's programs (neither fully animated nor informative). Sesame Street is included in the child informative category, but for this report is also analyzed separately. Viewing of adult audience programs was sometimes separated into primary vs. secondary viewing in order to distinguish those occasions when the child was interested or involved in viewing from those in which she was simply in the room while others (or no one) watched TV. In most of the analyses described in this report, primary and secondary viewing are summed to generate "Total Adult Viewing". The remaining categories reported, then, are "Child Informative," "Child Cartoons," and "Child Other."

Other Activities

The time-use diaries also yielded a wealth of information about the other activities comprising a child's day. In addition to sleep, eating, playing, transportation, and ordinary maintenance and hygiene activities, all uses of print media were grouped as "Reading." That included looking at books, magazines, and other print media, whether the child could read or not; being read to by an adult or older child; and actual reading.

A second cluster of major interest was educational activities, which included paper work, writing, drawing, singing, puzzles and games for learning, preschool curricular activities, educational or scientific hobbies, trips to museums, the zoo, historical sites, attending theater or concerts, computer work, lessons and practice in art, music, or dance, and the like.

The third cluster to receive special attention in analyses completed so far is the use of video games and computer games. These were of special interest because of their new popularity, and because in some respects they share the entertainment appeal of watching television stories. The category was dominated by the games, "Nintendo" and "Sega". It was of special concern to determine whether video game use was in direct competition for children's time with educational and/or entertainment television.

Negative concurrent correlations between time spent in alternate activity clusters would signal the presence of trade-offs, though the direction of the implied displacement would not be indicated.

Home and Family Characteristics

The demographic characteristics of the families reported above were ascertained during the parent interview in the annual office visit. Updates and changes were continuously and cumulatively recorded. Of particular interest for this report were the mother's years of education, which we took as an index of the educational level of the home and family and perhaps the emphasis the parents placed on education as a value for their children. The family's income / needs ratio was calculated from census bure. statistics defining the poverty level for families of different compositions.

The H.O.M.E. instrument is a combination of observational codes and structured interview questions with different levels corresponding to different age ranges for the target child. It is completed during a two-hour visit to the child's home when the child is present with a parent. It awards points for a long list of observed conditions, facilities, and responses to questions, as well as judged social and emotional attributes observed in mother-child interaction. The instrument predicts IQ and school performance of children from a wide range of socioeconomic backgrounds, income levels, and ethnic groups (Caldwell & Bradley, 1984). Our home visitors were trained by the staff of Caldwell and Bradley who devised the instrument, and maintained reliabilities of at least 80%. The score used in the analyses reported below is the total score for all subscales.

Measurement of Outcomes:
Academic Skills, School Readiness, and School Adjustment

Dependent Variables

Four basic academic skills are at the center of the concept of school readiness. Each was measured by a recognized standardized test, administered individually during the office visit or the home visit to each child.

Reading and pre-reading skills were assessed first by the Woodcock-Johnson Letter-Word Recognition Test. Children who reached a test criterion on the Letter-Word section were given the Woodcock-Johnson Passage Comprehension test, a standard measure of reading comprehension.

Math skills were assessed by the Woodcock-Johnson Applied Problems test, which involved counting, inequalities, simple arithmetic, and the like.

Vocabulary was measured by the Peabody Picture Vocabulary Test (Revised) with children of three years or older. It requires the child to point to one of four pictures on a page that illustrates or exemplifies a spoken word. The terms used range from simple objects to complex concepts. Past research has shown positive relationships between Sesame Street viewing and PPVT scores. For the first wave of the younger cohort (age 2), the Primary Language Scale (PLS) was used. Like the PPVT, it measures early linguistic competence.

School readiness was also assessed by administration of the Bracken Basic Concepts Test of School Readiness. The test includes knowledge of colors, shapes, letters, numbers, spatial and size relations, and the like.

A final outcome measure, School Adjustment was collected for children (mostly the older cohort) who were actually in school (kindergarten, first, second, or third grade), toward the end of the study. Each child's teacher was contacted directly and asked to fill out a questionnaire concerning how well the child had adjusted to the school environment, routines, discipline, social context, and work expectations, and how successful the teacher thought that child would be in future schooling.

All of the tests were scored according to the national norms for children of different ages. All except the Bracken Basic Concepts Test were normed with a mean of 100 and a standard deviation of 15. The Bracken scores were adjusted to the same scale from national norms. It must be stressed that these tests were not designed to be, nor are they tests of intelligence. Rather they are tests of present achievements that are relevant to

Figure 2

Total Weekly Viewing of Children's Programs

Younger Group (Cohort 1)

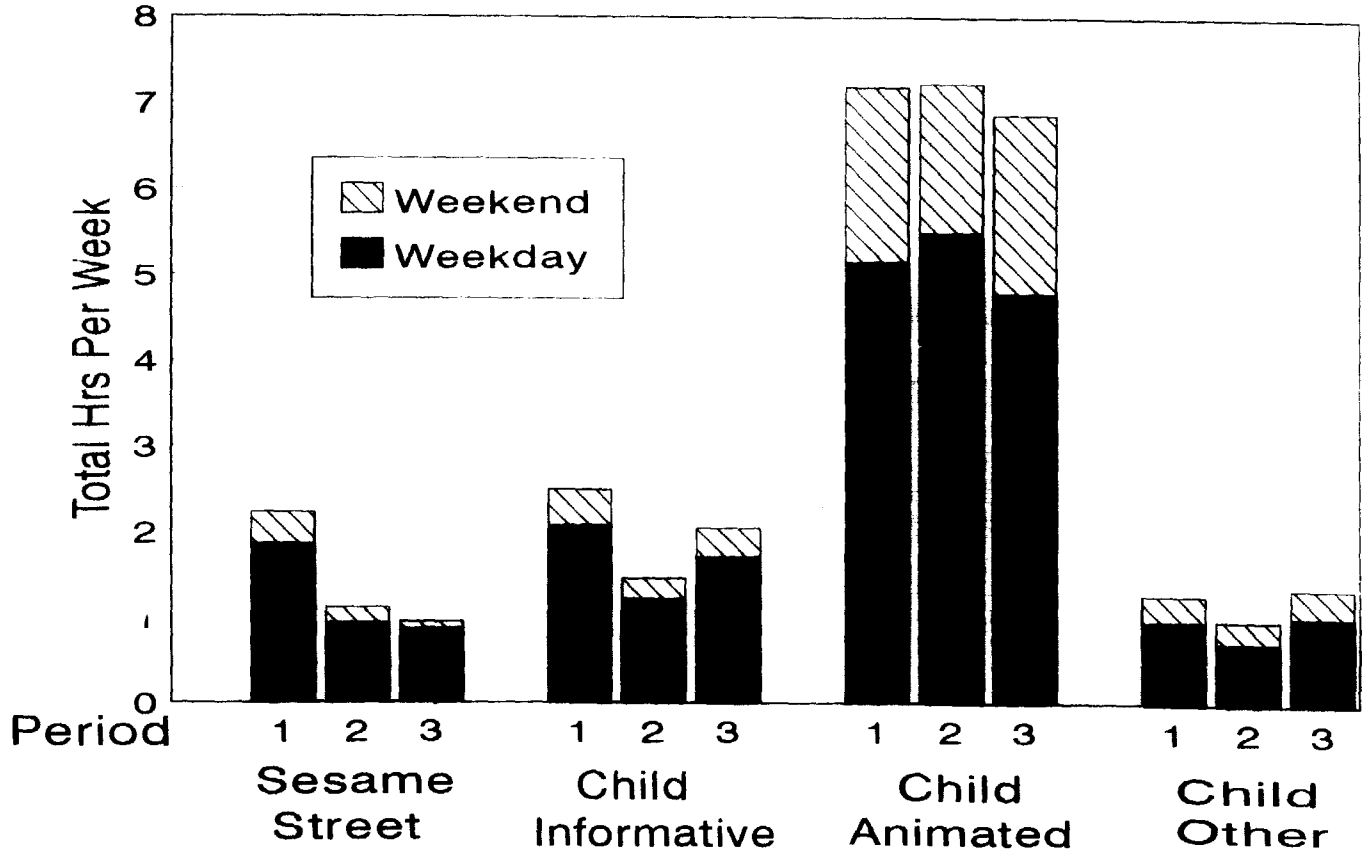
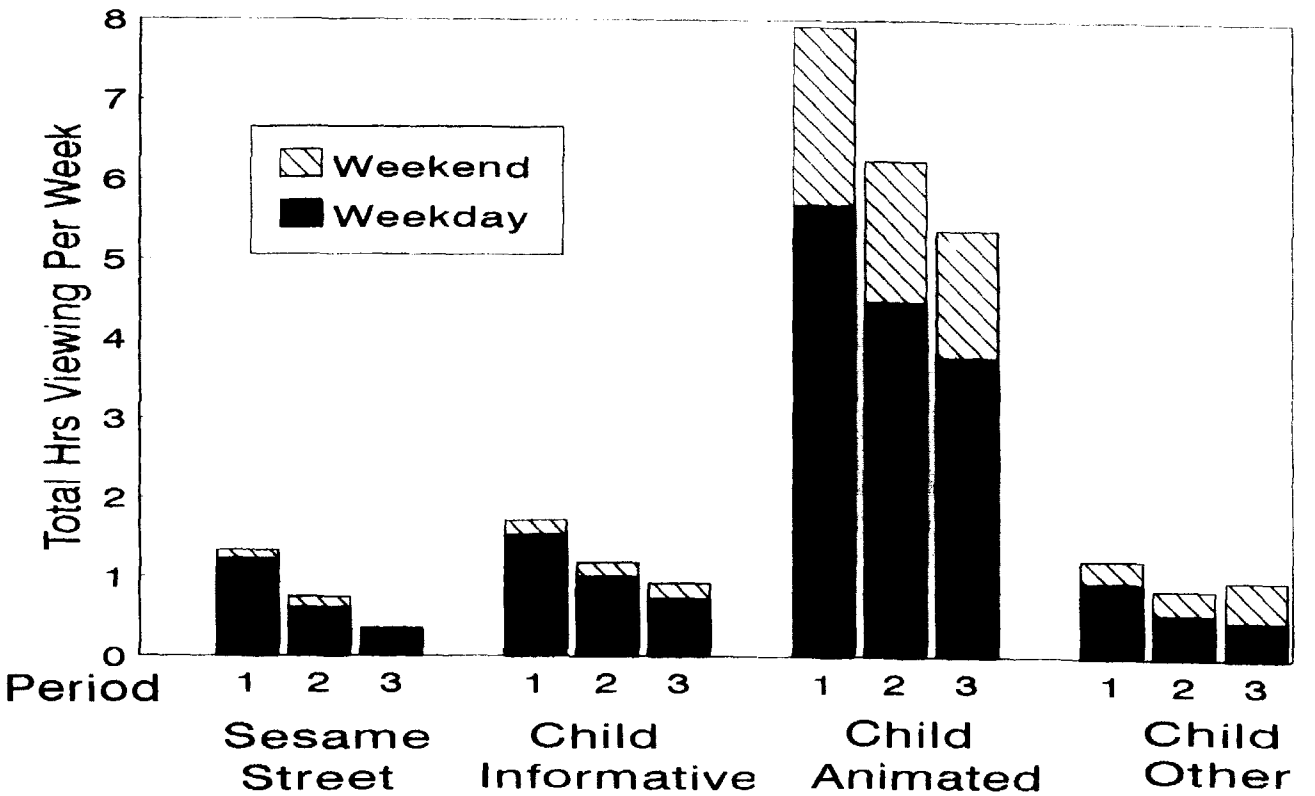


Figure 3

Total Weekly Viewing of Children's Programs

Older Group (Cohort 2)



success in elementary school. The School adjustment judgments by teachers were also adjusted on the basis of this sample to the same distribution.

For Hispanic children, all tests were administered by a fully bilingual person whose first language was Spanish. All tests except the Peabody Picture Vocabulary Test were administered in the child's preferred language. The PPVT was always administered in English because we were interested in the child's school-usable vocabulary and whether they had learned English vocabulary from viewing Sesame Street.

RESULTS

Television Viewing Patterns

Age Changes in Viewing

In Figure 2 (Cohort 1) and Figure 3 (Cohort 2) are shown children's viewing of children's programs in each of the four major categories, based on the time-use diaries. Cartoon viewing clearly predominates at about 7.5 hours per week, but it declines between ages four and seven to about 5 hours per week. Child informative viewing is much lower at about 2 hours per week at two to four years, one hour per week at five to seven years. While there is some variation, about 80% of child informative viewing is watching Sesame Street. For the non-animated programs, only 10 to 20 % of viewing is on weekends, while 25 to 30 % of cartoon viewing takes place on weekends.

It is important to note that these viewing data are valid for the families in the sample, but that sample is too small to use for reliable national viewing estimates. Moreover it was a sample selected not to be representative of U.S. families in general, but of urban, low-income families with children of the targeted ages. Thus while this sample is appropriate for generalizations about patterns and co-variations of viewing with other variables, it is better to draw inferences about national viewing trends from the Westat study cited above (Zill, Davies, & Daly, 1994).

Although Sesame Street was by far the most frequently viewed program at all ages, other child informative programs were increasingly watched as children got older. After Sesame Street, the programs watched most often in period 3 were: Mister Rogers' Neighborhood, Reading Rainbow, Captain Kangaroo (which was still being shown in re-runs on public television), Mr. Wizard's World, and 3-2-1 Contact. Because families entered and completed the study on a staggered schedule, the final period of viewing data spans calendar years 1992 and 1993 for different participants.

The declines with age reflect not only the process of maturation, but also the increasing likelihood that the child moved into child care, preschool, and elementary school. Preschools have been somewhat resistant to including television, even Sesame Street in their curricula, probably because parents associate children's TV viewing away from home with the idea of electronic baby-sitting. Moreover, CTW's Preschool Education Program (PEP), which incorporates the viewing of educational children's programs, had not yet reached most child-care centers and preschools. Also the integrated "Ready to Learn" program of nine hours per weekday of children's programming on selected PBS stations had not yet been inaugurated.

If the data had been collected in 1994-95, undoubtedly a number of other child informative programs would have been in the most-viewed list, including Barney and Friends, Shining Time Station, Lambchop, Beakman's World, Where in the World is Carmen San Diego?, Square One, Cro, and Ghostwriter.

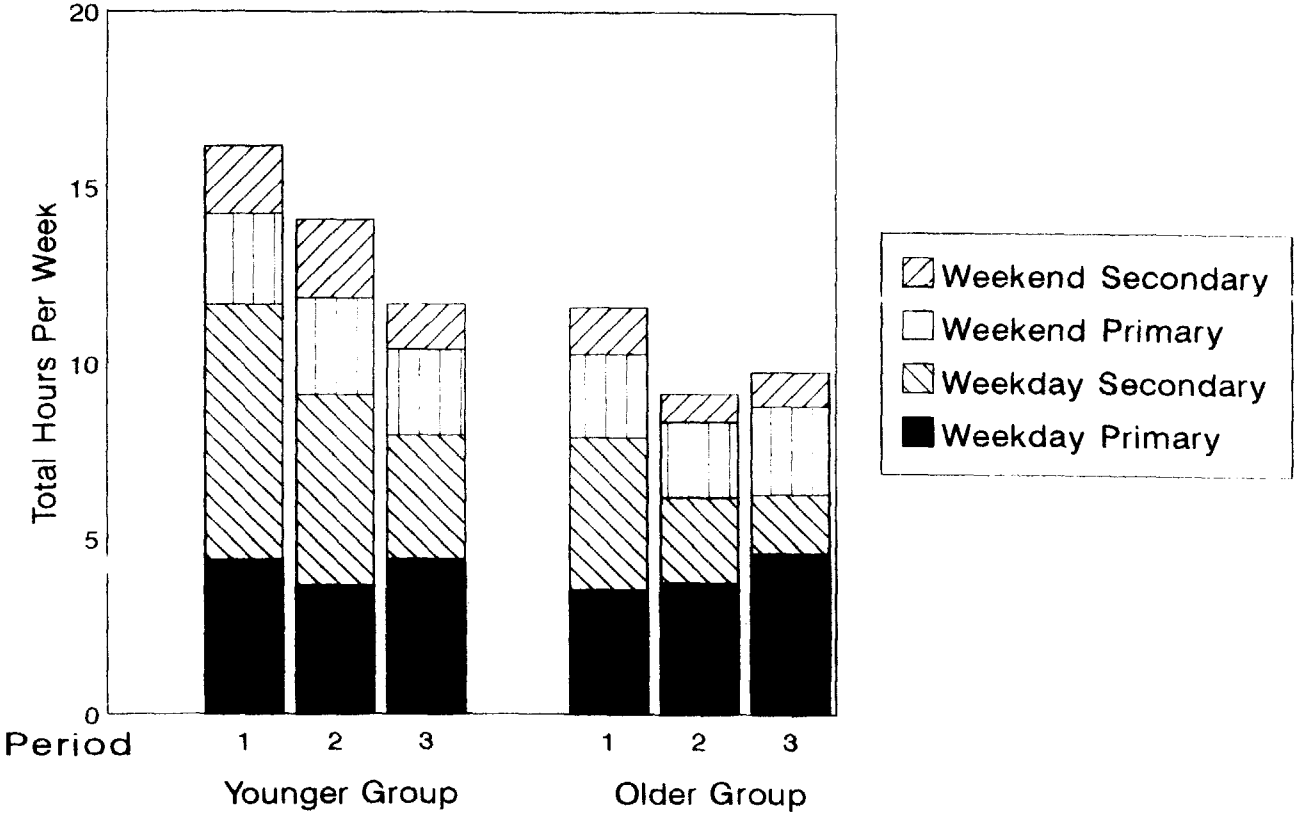
Figure 4 shows the mean amount of viewing in hours per week reported in the time-use diaries that was devoted to all adult programming combined, based on the checklist procedure in the interviews. The two cohorts are shown separately for each of the three viewing periods. The younger group (Cohort 1) in period 3 are four- and five-year-olds, the same age as the older group (Cohort 2) in period 1. There is a decline from about 16 hours per week at age two or three to about ten hours per week at ages five and six, with an upturn in interest as the child reaches six and seven. What declines most with age is clearly secondary viewing, that is, being in the room with a TV set that is on and showing an adult program, probably with adults present and watching, while the child's primary focus is on some other activity.

Concurrent Relationships among Viewing in Different Program Categories.

Critics of television often lump all viewing together and conclude that it is harmful to children. We propose that such generalizations apply partially at best. The medium is not monolithic, and those who assume it is do a disservice to children in general, and especially to those in disadvantaged families, where it may be the primary source of entertainment and information. Even those who recognize that educational programming is different from adult entertainment programming sometimes fear that viewing educational programming may lead children to become heavy users of all types of television. In an earlier study it was the case that heavy viewers of Sesame Street and other children's informative programs also watched more general-audience entertainment television (Huston, et al., 1990).

Figure 4

Total Weekly Viewing of Adult Programs



The present results show the opposite pattern. Children who watched Sesame Street and other child informative shows spent **less** time with cartoons and adult programs than did children who were infrequent viewers of educational programs, and vice versa. In other words, child informative viewing tended to displace cartoon and adult program viewing.

Figure 5 shows the correlations between child informative viewing and viewing in the other categories of programs. Positive correlations indicate that children tend to be heavy viewers of both categories or light viewers of both categories -- whatever they do with one, they do with the other. Negative correlations indicate a trade-off or displacement relationship between categories -- the more you watch one, the less you watch the other and vice versa.

"Child other", a category that includes non-animated, non-informative programs like many of those on Nickelodeon and Disney cable channels, is positively related to child informative viewing at ages two to five, but not at six or seven. But child informative viewing is negatively related to cartoon and adult program viewing among children aged five and under. Cartoon and adult program viewing are positively correlated with each other. Accordingly it may be that two types of viewing patterns predominate among preschool-aged viewers: those who like child informative and other children's programs, and those who prefer cartoons and adult programs.

Interrelationships Among Time Use Activities

Figure 6 shows the concurrent relationships among other diary activities for each of the three periods. The three clusters selected are described above: first, reading or being read to or looking at books; second, educational activities like art, music, paper and pencil games, fine motor tasks, lessons and practice, cultural events, and preacademic activities in preschool or child care or at home; and third, video or computer games.

The data are consistent across all three periods. The more time spent in educational activities, the more time is spent in reading. The more time spent in educational activities, the less time spent playing video games. But reading and video games are not related at all, perhaps because both were relatively infrequent. Nintendo, Sega, and other "joystick" video games have no literacy demands and make use of mostly exciting pursuit, combat, or escape scripts. In sum there are probably two clusters of non-TV time use: one focussed on reading and educational activities, and another, involving different children, that is focussed on arcade-type video games and sensorimotor skills.

Figure 5

Concurrent Correlations of ***Child Informative Viewing*** with Viewing of Other Categories of Programs

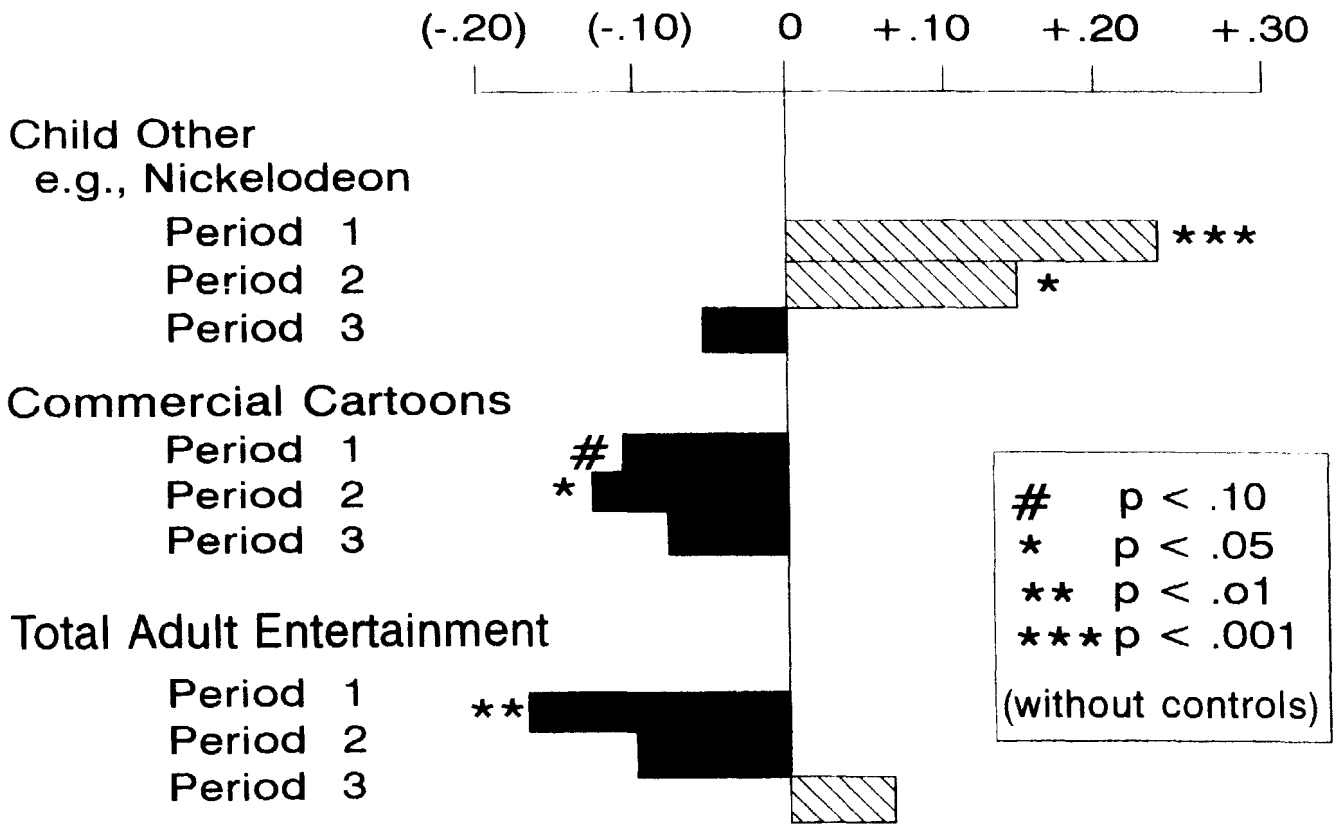


Figure 6

Correlations Among Diary Activities

Period 1

	Reading	Educational Activities	Video Games
Reading	---		
Educational Activities	+ .30***	---	
Video Games	.02	− .21***	---

Period 2

	Reading	Educational Activities	Video Games
Reading	---		
Educational Activities	+ .38***	---	
Video Games	.02	− .12#	---

Period 3

	Reading	Educational Activities	Video Games
Reading	---		
Educational Activities	+ .40***	---	
Video Games	.06	− .15*	---

Relations of Viewing to Other Activities

Next we consider how television viewing shares time with other activities in the child's life. One of the persistent questions about television is whether it displaces other activities that might be beneficial for children. Specifically we want to know if time spent viewing television is in a trade-off relationship with reading and other types of educational activity, and if so, what kinds of television viewing displaces (or may be displaced by) more constructive activity.

The displacement myth in its most extreme form blames television for a general decline in school achievement, SAT scores, and literacy in the population. There is almost no evidence supporting this belief. The relationship between television viewing and school achievement is not the expected one. Children with the highest levels of school achievement watch an average of about 10 hours a week; they do better in school than the children who watch little or no television. Above 10 hours a week, school achievement is lower the more television a child views.

We have evidence of what happened when television was introduced in the United States and Canada in the 1950s (Williams, 1986) and in South Africa in the 1970s (Centerwall, 1989). Listening to the radio and going to movies were the two activities that declined most when television became available. The simple interpretation of this pattern is that television displaces activities that are "functionally equivalent," that is, activities serving functions for the individual that are similar to those served by television. Radio and movies were used by consumers as sources of comedy, drama, news, and general entertainment. Television served these functions better than radio because it added visual images, and it was more convenient and less expensive than movies.

Activities that might contribute to school achievement were much less likely to be displaced by television. One example is homework. Teachers often complain that children watch television instead of doing homework (or while doing their homework). That may be true, but children without television spent no more time on homework than those who had it available. In South Africa, children from 5th through 12th grade were questioned before television was introduced and again each year for six years after it was introduced. There was no difference in the amount of time spent doing homework before and after television became available, even though children watched TV on the average between 15 and 20 hours a week.

The displacement myth attributes to television the power to lure children away from more demanding and more creative pursuits. It is equally plausible that television is a default used when few other alternatives are available. Rather than drawing people away from more valuable activities, television is used to fill the time not otherwise occupied.

Much of what we know about differences between heavy and light viewers fits this hypothesis. The amount of television watched by children and adults can be predicted largely by knowing how much time they spend at home and how many other possibilities are at their disposal. For example, preschool children at home all day watch more television than those in organized child care. People with low incomes cannot afford lessons, outings, shopping trips, and movies; they watch more television than those who can.

A second popular version of the displacement myth is that television interferes with children's interest in reading. There is a grain of truth in this belief. Leisure reading declines slightly as a result of television being available. For example, children in South Africa reported spending slightly less time reading after television was introduced.

But, the simple answer ignores the fact that all television is not alike. Television can stimulate children's interest in books as well as drawing them away from books. Several popular children's programs feature books. Story Time and Reading Rainbow are outstanding examples. The goal of these programs is to pique children's interest in reading, not to teach reading skill. Evaluations of Reading Rainbow have shown large increases in library and bookstore requests for books featured on the program. Parallel trends have occurred for adults when docudramas based on books are shown on television.

Producers of educational television, in turn, want to know what kinds of activities displace the viewing of their programs. A particularly interesting current example is the time spent with video games like Nintendo or Sega. Appendix A contains information on the availability and use of other media in our sample of families, over the course of the study.

Accordingly we now consider the concurrent relationships between time-use records of viewing selected categories of television programs and time spent on these types of other activities. Figures 7, 8, and 9 display these relationships in the form of concurrent correlation coefficients for each of the three time periods. High viewers of Sesame Street and other child informative programs spent more time reading and engaging in educational activities than did low viewers. Therefore educational television viewing did not displace print use and educational activities; rather it may have enhanced them.

By contrast, children who spent a lot of time watching cartoons and adult programs, relative to others in our sample spent less time in educational activities and reading. The critics' concerns about displacement of more constructive activities by television viewing do seem to apply to general entertainment viewing, but that relationship is reversed when it comes to viewing of informative and educational television programs.

Figure 7 -- Period 1

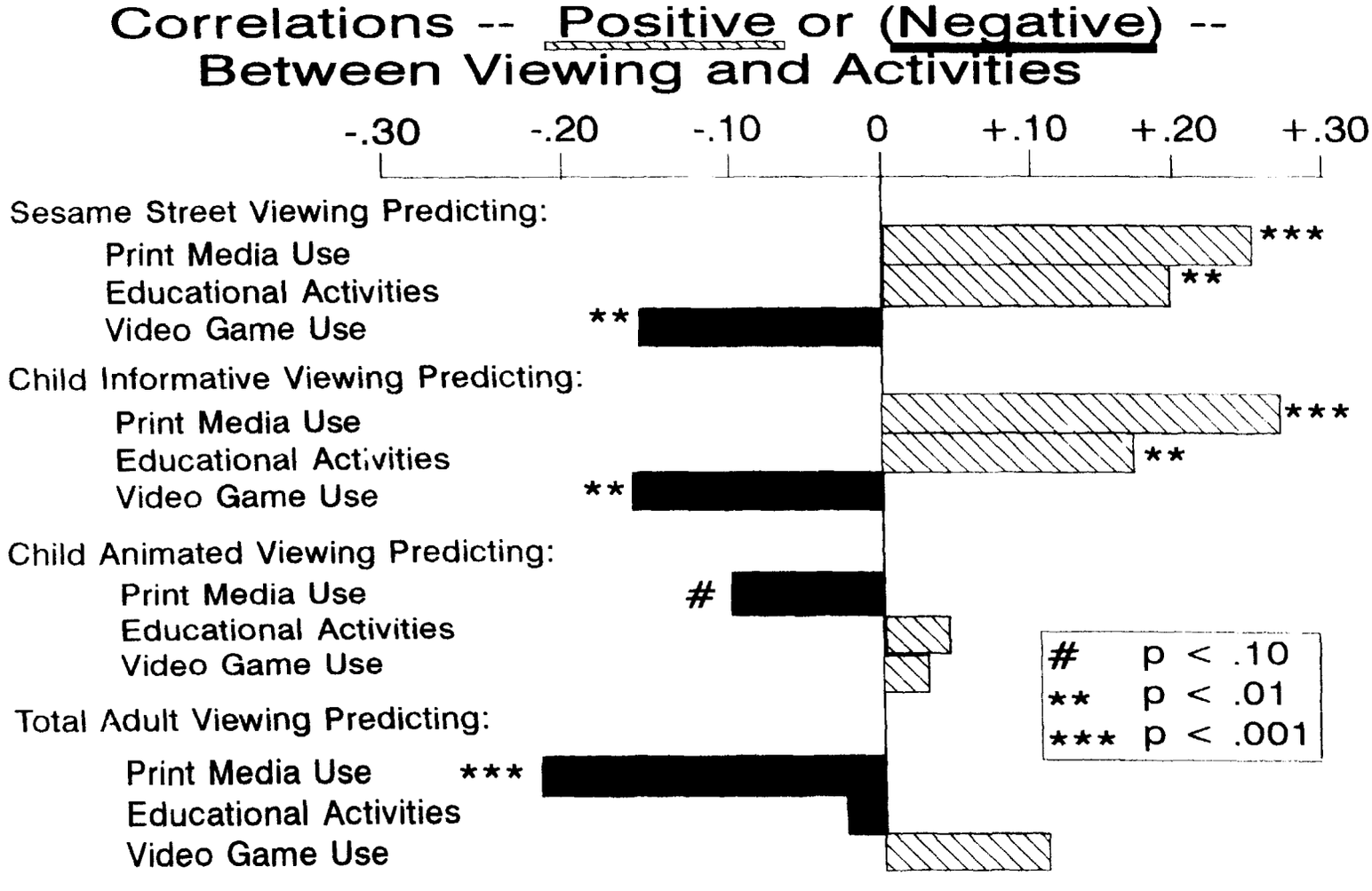


Figure 8 -- Period 2

Correlations -- Positive or (Negative) -- Between Viewing and Activities

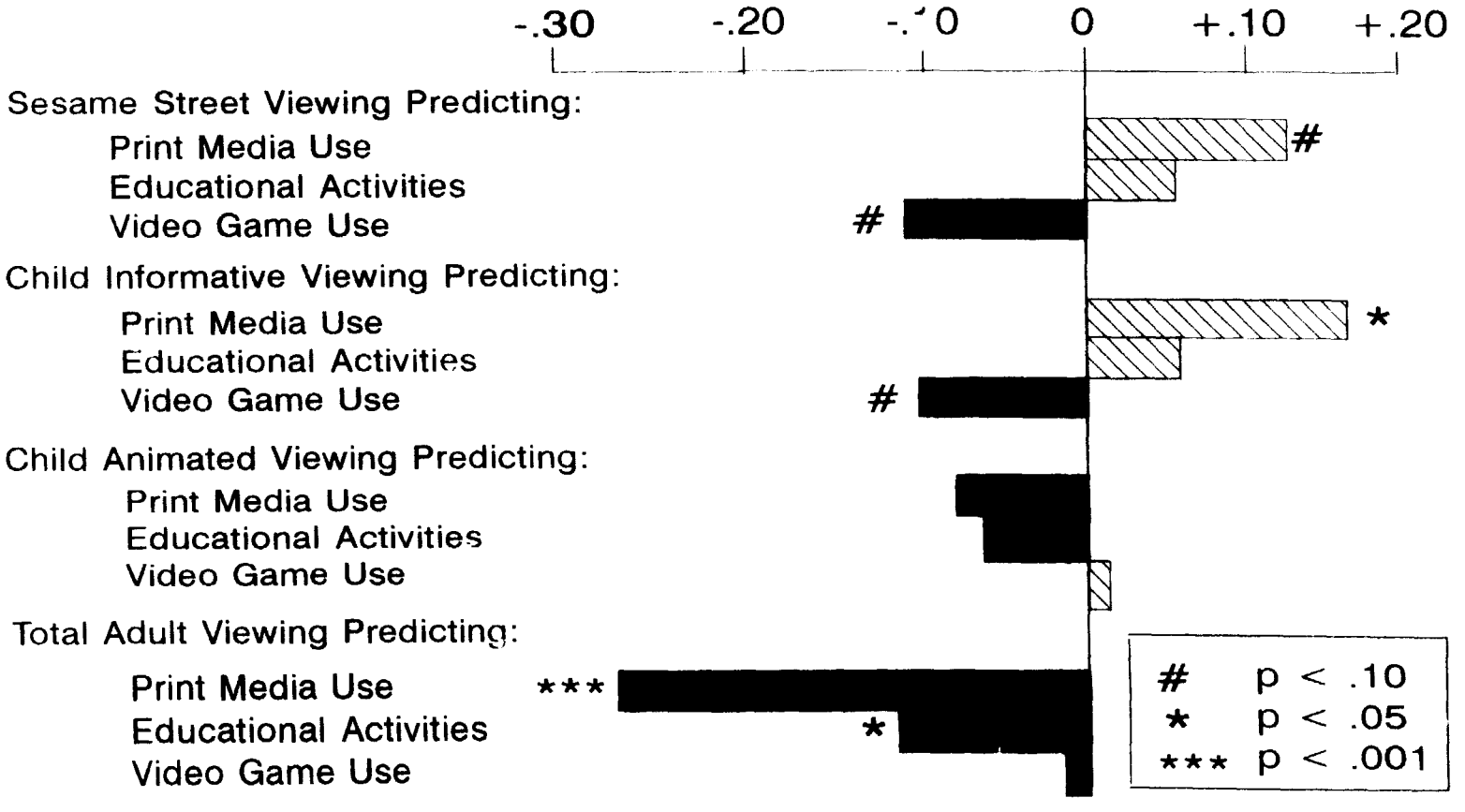
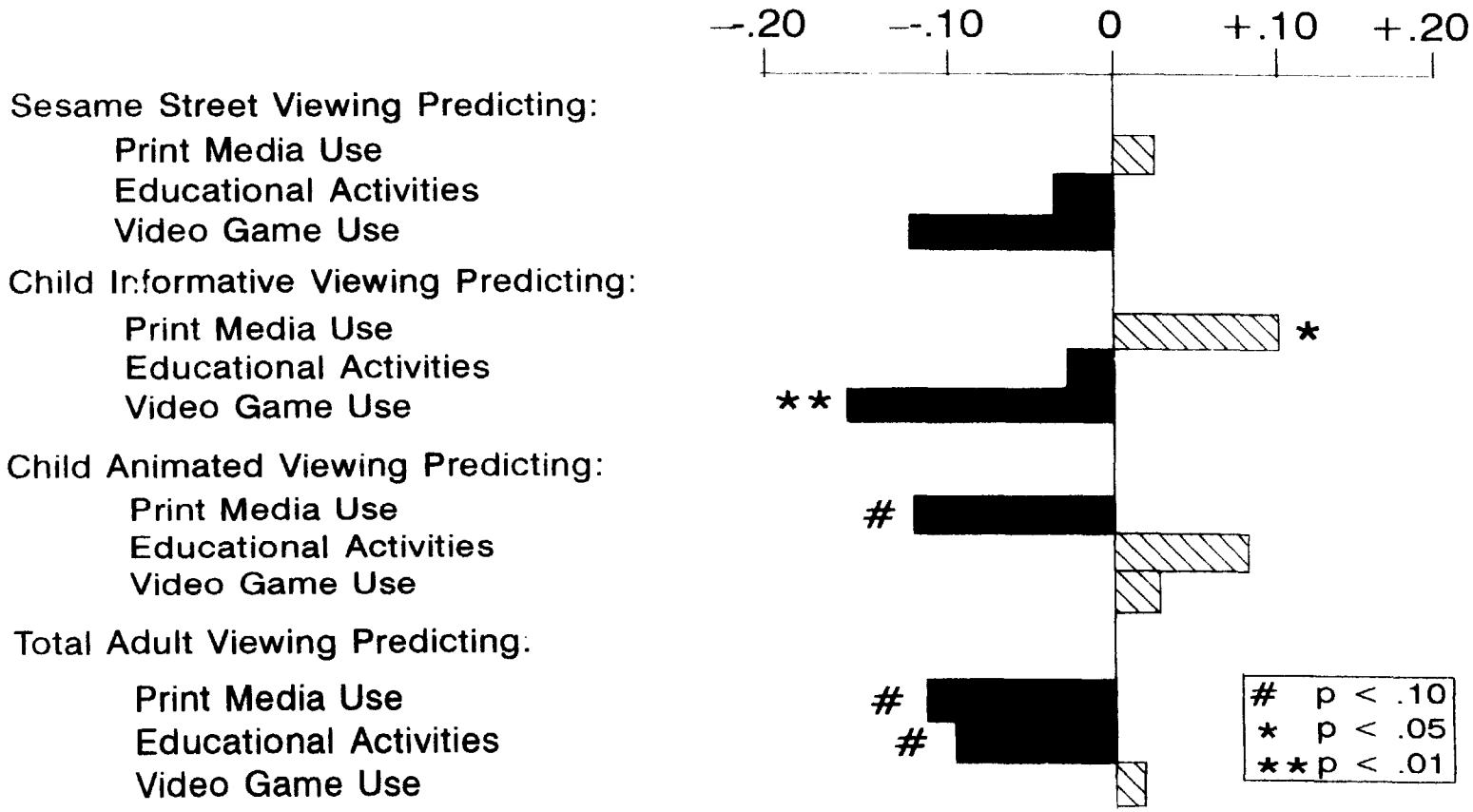


Figure 9 -- Period 3

Correlations --# Positive or (Negative) -- Between Viewing and Activities



Children who spent a lot of time on video games watched less of Sesame Street and other children's informative programs than did children who spent little or no time on video games. Therefore video game use may displace the viewing of educational programs in the child's day, and vice versa.

These concurrent correlations are not corrected for the fact that "third variables" could be accountable for the relationships found. For example family characteristics associated with parent education and income could account for both the variation in educational program viewing and the differences in time spent on other activities. Even if these patterns of time use are associated with social and demographic characteristics, they provide important information about how and why social and demographic variables actually help determine a child's everyday experience.

The Bottom Line:
Basic Learning Skills and School Readiness

Educational television is designed to achieve a wide range of educational goals for children in both the cognitive and social domains. It is not limited to preparing children for school in the narrow sense of basic kindergarten-level facts and skills, though that has always been one of the important objectives of Sesame Street.

The final section of this report is concerned with analyses of the degree to which various kinds of television viewing as measured by the time-use interviews at one period predict test performance and actual school adjustment at later points in time (i.e., waves). For the most part the simple correlations between viewing informative programs and test scores are positive. That is, children who watch Sesame Street and other child informative programs performed better than those who did little or no informative TV viewing.

However, as suggested above, we also know that families who are better educated and who provide a stimulating and supportive home environment for the young child are also likely to be the same families who encourage their children to watch Sesame Street and the other informative children's programs. Thus differences in school readiness, test-score performance, and school adjustment could be due to family characteristics rather than to the viewing with which they are statistically associated.

Control Variables.

In order to be sure that the effects of the viewing we assessed were the ones being reflected in the outcome measures, we needed to control for what the child already knew or could do in that domain at the beginning of the study. In other words, we needed to know

that the benefits or deficits we might observe from viewing informative, educational programs, as well as from watching commercial entertainment programming, were not already there at the start of our study. To start the study on a level playing field, we entered our best early estimate of the children's verbal abilities at the time of Wave 1 as our first control variable. For the younger cohort it was their score on the Primary Language Scales at age 2 (PLS, Wave 1). For the older cohort it was their score on the Peabody Picture Vocabulary test at age 4 (PPVT, Wave 1).

Next we needed to separate the cumulative contributions of family and environmental variables from those of television viewing, in determining individuals' performances on the outcome variables. To that end we analyzed what major classes of variables predicted both television viewing and test performance (Early Window Project, 1993). In addition to the child's PLS or PPVT language scores at the very first wave of data, four other basic characteristics of the family were identified as critical. They were basic in that they were measures of important and distinctive underlying characteristics, and they were critical in the sense that they were strongly related both to viewing and to test performance. These four, plus initial language scores, comprised the control variables.

The first family control variable was mother's years of education.

The second control variable was family income / needs ratio. This is calculated by dividing the total family income by the amount defined by the census bureau that year as the poverty threshold for families having that family's composition.

The third control variable was the primary language spoken in the home (English or Spanish). Language turned out to be a "suppressor variable" in that Hispanic American parents often viewed Sesame Street, with their children, as a way to help them learn English themselves because of its basic vocabulary and clearly presented concepts. But the children in those same families, having English as a second language did not always perform as well as the average native English speaking children. Thus, for extraneous reasons, they represented high viewers with low outcome scores.

The last basic control variable was the total score on the HOME, the Home Observation Measure of the Environment, as described above. It provides a standardized index of the social, emotional, and intellectual quality of the home environment for young children. It predicts IQ and school performance for children from a wide range of socioeconomic backgrounds, income levels and ethnic groups. It was collected during each of the four annual home visits.

In all of the analyses reported below, these four variables, plus initial language skills were controlled. That is, children's outcome scores were statistically corrected for the effects of initial linguistic skills, maternal education, income, primary language, and HOME score. Then we evaluated whether the amount of television viewing in program categories was related to the corrected outcome score measured one to three years later.

This analysis is much more stringent than one which merely controls demographic differences. The control variables routinely account for many of the individual differences in the outcome measures. So when an effect of earlier viewing on a later outcome measure appears, it has already survived a rigorous set of controls.

The next seven figures show the approximate advantage (positive) or disadvantage (negative) on the outcome measures experienced by a child who viewed 25 minutes a day in the designated TV categories, as compared with a child who did no viewing, after the control variables have been taken into account. In the statistical analyses, all viewing times were converted to the square root of the number of minutes per day (averaged across all diaries in that period) in order to make the distributions suitable for the analyses used. This meant that we could illustrate the effects of 5 units of viewing (the approximate equivalent of 25 minutes per day of viewing) in order to give the reader a concrete idea of the magnitude of the effects. Note that 50 minutes of viewing would not have twice the impact of 25 minutes -- it would be equivalent to approximately 7 units. In order to double the magnitude of the effect shown for 5 units of viewing, one would have to watch 100 minutes a day, corresponding to 10 units of viewing.

Recall that the outcome measures all have the same scale with means of 100 and standard deviations of 15, so that an advantage (or disadvantage) of five points on the outcome variables is about a third of a standard deviation.

As seen in Figure 10, for the younger cohort, viewing Sesame Street at age 2 was positively associated with reading, math, vocabulary, and school readiness skills at age 3. The same was true of child informative program viewing generally, but not for commercial cartoon viewing.

More interestingly, the high early viewers of educational programs (age 2) still had an advantage over lower early viewers three years later at age 5 (Figure 12). This advantage was not apparent in the middle year (age 4) for reasons that are not apparent, but the positive effect on Bracken school readiness was still manifest for the younger cohort (Figure 11). Cartoon viewing at age 2 yielded a small disadvantage at age 4 on the PPVT.

Figure 10

Cohort 1: Viewing at age 2 predicting test score advantage (+) or disadvantage (—) at age 3.

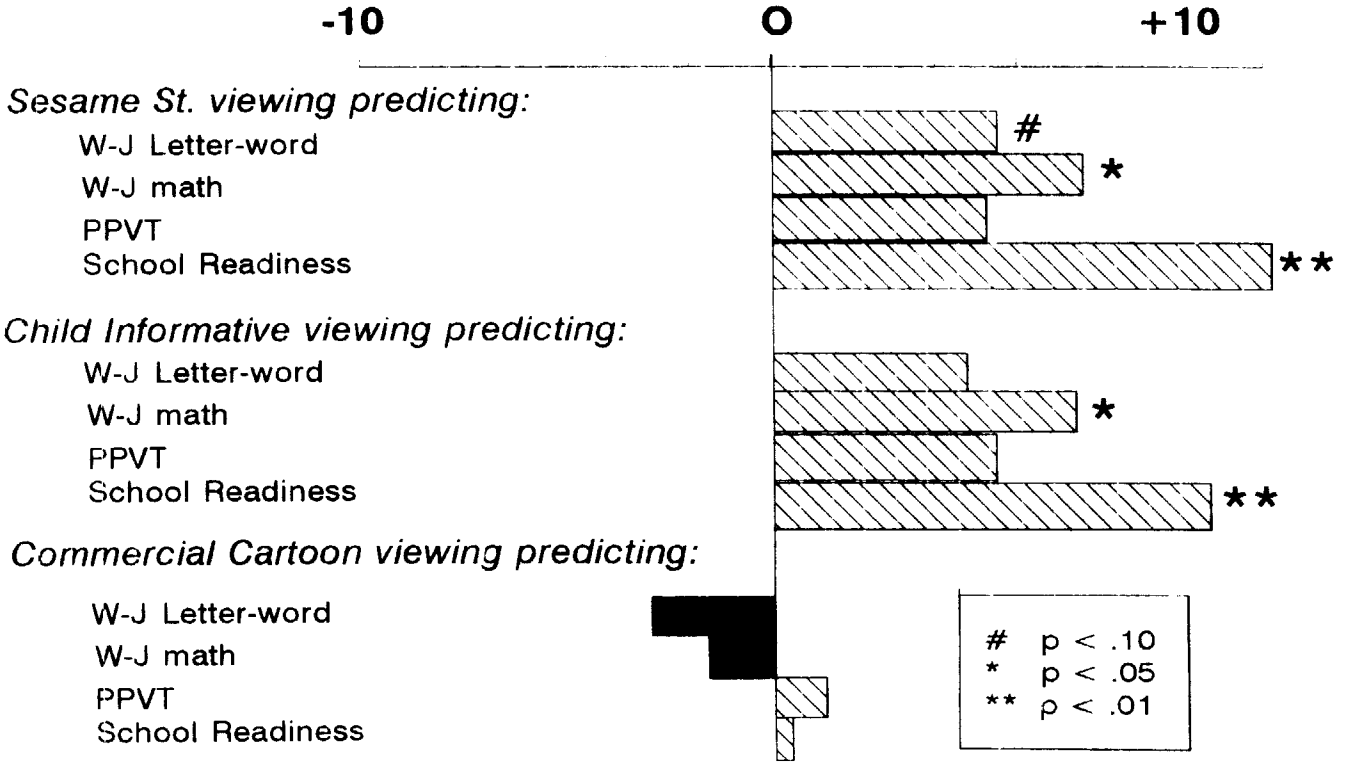


Figure 11

Cohort 1: Viewing at age 2 predicting test score advantage (+) or disadvantage (−) at age 4.

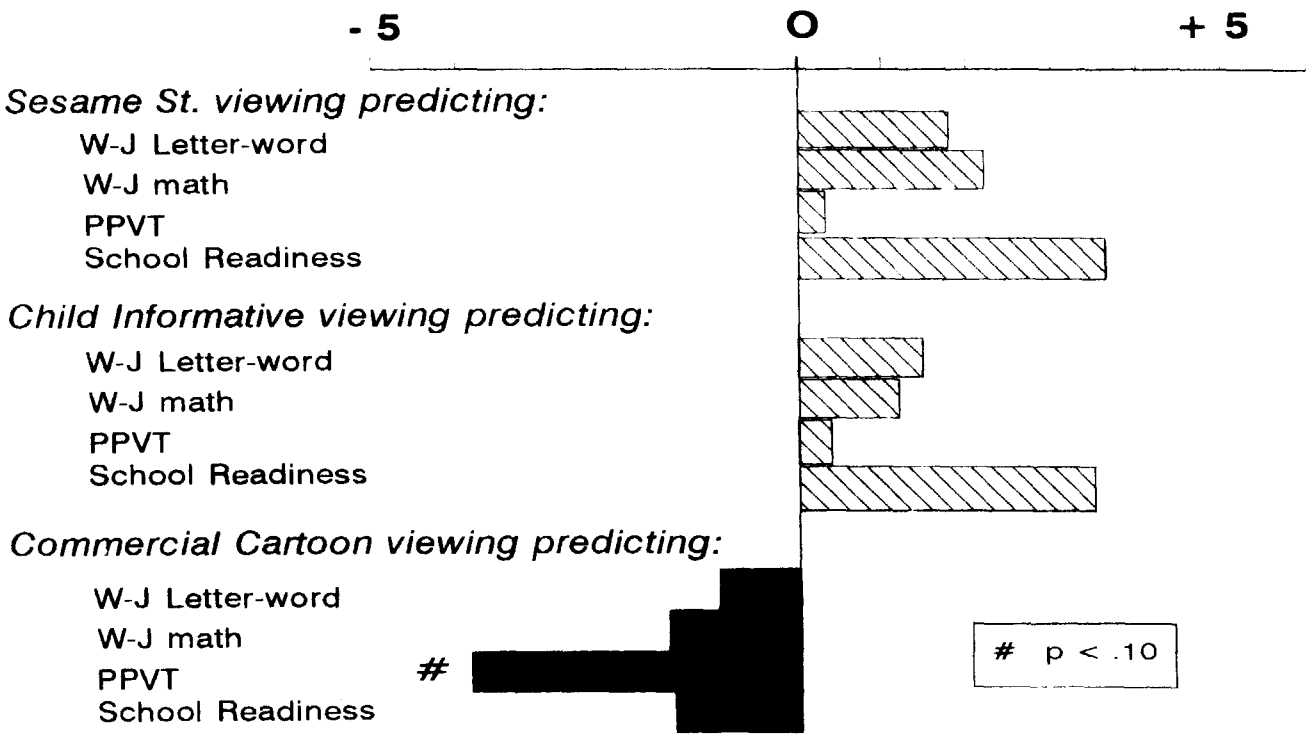


Figure 12

Cohort 1: Viewing at age 2 predicting test score advantage (+) or disadvantage (−) at age 5.

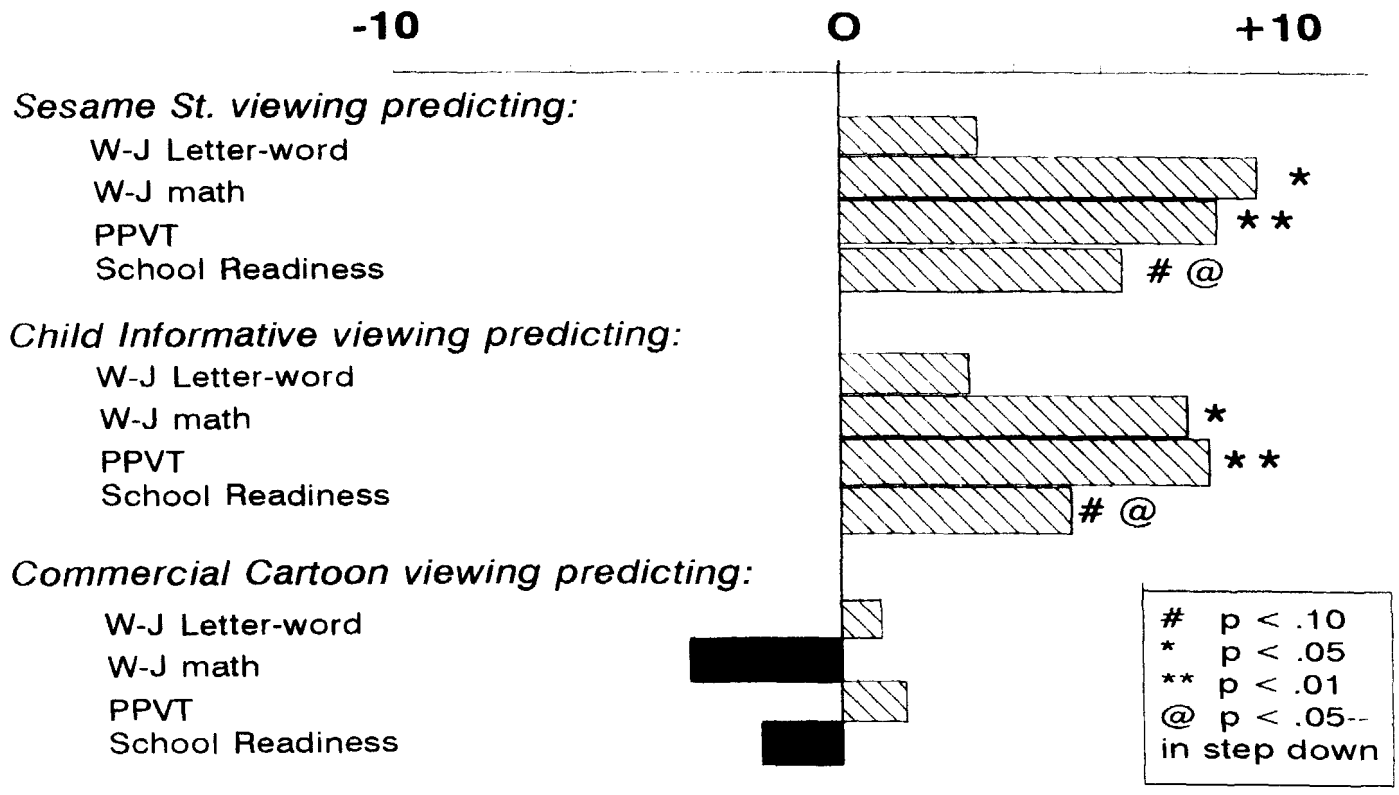


Figure 13 shows predictions from age 3 to age 5, where the same patterns again prevail: advantages for Sesame Street and other child informative program viewers in Letter-Word and School Readiness tests, but a disadvantage for heavy cartoon viewers, this time in School Readiness.

In Figure 14 are the predictions from age 4 to age 5. There are not significant effects of viewing Sesame Street or child informative programs, but the negative pattern for heavy cartoon viewers is significant for Letter-Word and for School Readiness.

In Figure 15, we see significant positive effects for the first time in the older cohort: child informative viewing at age six leads to an advantage in reading comprehension at age 7, but the other effects, while in the familiar directional pattern, are not significant.

Finally, in Figure 16 we see that for all of the children whose school adjustment was rated, the same pattern of effects appears: benefits for heavy viewers of Sesame Street and child informative programs, and, if anything, deficits for heavy viewers of commercial cartoons. Only the positive effects of child informative viewing on elementary school adjustment reach borderline significance, however.

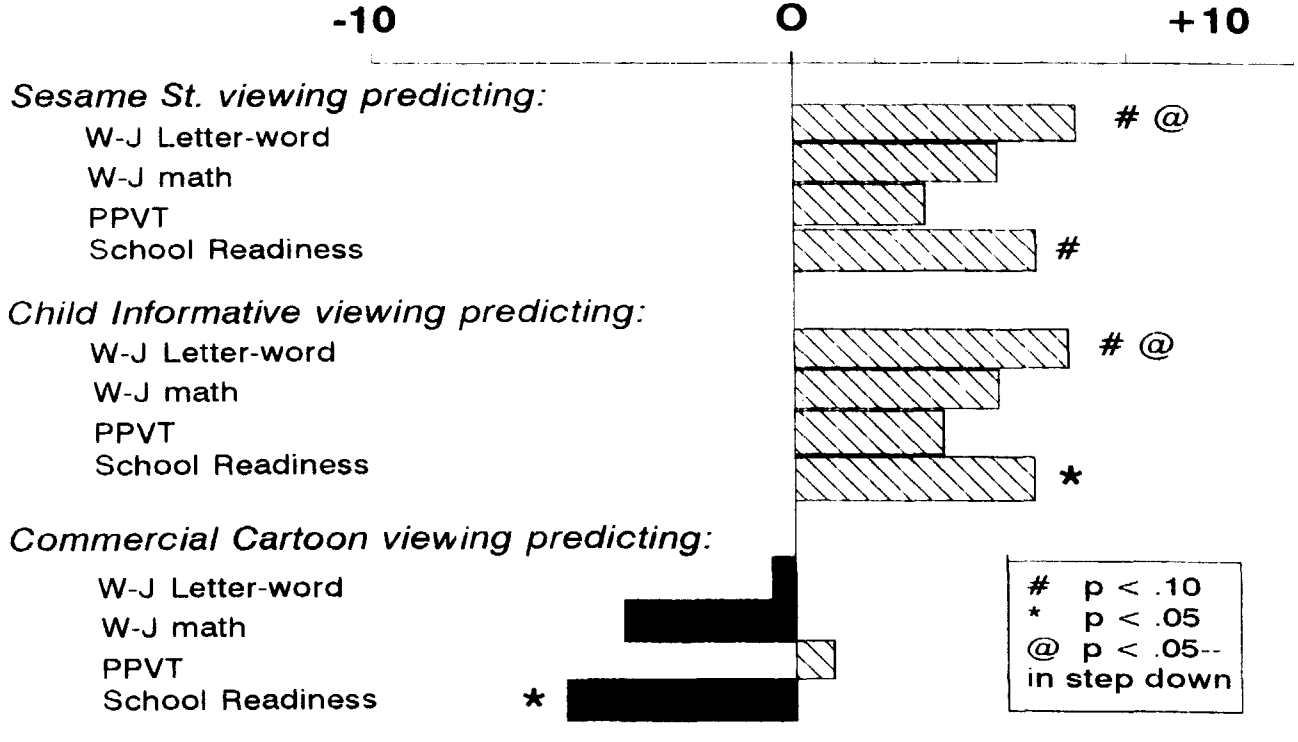
The negative effects of commercial cartoon viewing are seen in Figures 11, 13, and 14. But throughout these figures the direction of effects and patterns of influence, whether statistically significant or not, reveal a consistent tendency for negative effects of cartoon viewing and positive effects of child informative viewing in general and Sesame Street viewing in particular.

Some Interpretive Cautions

These findings require replication. The viewing measure included only weekday viewing because most of the time spent viewing educational programs was on weekdays, and some of the children were missing time-use diaries on weekends. Hence the sample size would have been seriously reduced had weekends been included. In prior analyses, however, some of the effects were actually stronger when weekends were included.

The same types of analyses have yet to be performed using mothers' checklist data from the interview instead of the diary data.

We have yet to apply structural modeling techniques to these data and related growth curve modeling techniques may be applicable as well. We expect that the final set of analyses will incorporate all the measures in a different type of procedure that provides a more powerful test than the techniques used so far. There is strong encouragement in these results, and the outline of a final model is beginning to appear.

Figure 13

Cohort 1: Viewing at age 3 predicting test score advantage (+) or disadvantage (–) at age 5.