Demographic Predictors of Media Use Among Infants, Toddlers, and Preschoolers

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A great deal of research during the past four decades has explored the effects of media use on children, but remarkably little work has explored the factors that determine how much time a child spends interacting with various media. This article does so with a focus on very young children, ages 6 months to 6 years, and on demographic predictors of media use. Using data from a large-scale national survey sponsored by the Kaiser Family Foundation, the authors conducted multiple regressions predicting time spent watching television, watching videos/ DVDs, reading, playing video games, and using computers. Child's age, race, parents' education, and parents' marital status had significant effects across most types of media use, whereas child's gender, birth order, languages spoken at home, parents' employment status, and parents' age had only occasional, isolated effects. Family income had no impact at all. Findings suggest various intriguing hypotheses about the processes that might explain the relations observed, thereby setting the stage for future research testing these possibilities.

Keywords: media use; social influence; television; computers; demographics

For decades, researchers have been studying the effects of exposure to media on young people. A great deal of such work has examined the impact of television exposure on outcomes such as violent behavior, the cognitive and social development of children, and their use of leisure time. Most of these studies have focused on children between 6 and 18 years old; rarely have studies included very young children (for exceptions see, e.g., Alwin, 1982; Gentile & Walsh, 2002; Roberts, Foehr, Rideout, & Brodie, 1999; Wright et al., 2001). Likewise, research exploring the factors that influence media exposure has only rarely examined children younger than age 6 (e.g., Bickham et al., 2003; Krosnick, Anand, & Hartl, 2003).

In studying the role of media in the lives of youth, it is important to recognize that the media landscape has undergone tremendous change in recent decades. A range of new technologies have found their way into American homes, which are routinely equipped not just with radios and televisions but also with computers, electronic games, video recorders, and audio systems that generate digital quality sound (Roberts et al., 1999). All these technologies occupy children's time and have the potential to affect their thoughts and behaviors. Therefore, because a great deal of evidence documents the effects of traditional media (such as radio and television) on children between the ages of 6 and 18 years, there is a need for new research on the impact of old and new technologies alike on very young children. And although we know a fair amount about the effects of media, particularly on school-age children and adolescents, we know far less about the various factors influencing what kinds of media are used in the first place. This is particularly true for the media use of very young children, as there remains a striking dearth of research in this area.

In 2003, the Kaiser Family Foundation (Rideout, Vandewater, & Wartella, 2003) sought to close this gap by conducting a study of the media-use habits of very young children. Parents of children between ages 6 months and 6 years were asked about their children's media-use habits; more than 1,000 such parents were interviewed between April and June of 2003. Respondents were asked about the amount of time their children spent using various media (television, videos/DVDs, books, video games, and computers) on a selected day. Data were also collected on a range of social and demographic characteristics of the children, their parents, other family members, and social contexts.

This article presents the results of analyses conducted to explore how demographic variables are related to children's exposure to various media. To achieve this goal, the Kaiser Family Foundation survey data (Rideout et al., 2003) were analyzed using a variety of statistical techniques. We begin below by offering a series of hypotheses about the possible relations of demographics with exposure to various media. Then we describe the measures we examined and the codings of responses used for our analyses. Finally, we outline our findings and summarize their patterns and implications.

HYPOTHESES

To provide a flavor for reasons why we might observe relations of demographics with media use, we offer some selected hypotheses below. These are not meant to be comprehensive but are simply intended to document a few expectations that the current analyses might confirm or disconfirm.

- *Income*. Low-income families are less likely to have the funds available to finance entertainment outside of the home. Therefore, children from lower income households might be exposed to television for greater periods of time, owing to lack of alternatives (Comstock & Scharrer, 1999; Hagborg, 1995; Medrich, Roizen,

Rubin, & Buckley, 1982). Families with higher incomes can afford to purchase home entertainment media devices such as electronic games and computers, and the availability of electronic media in the house may increase the time that children spend with these media and decrease the time spent on other activities (Hofferth, 1998). Thus, children from households with higher incomes might spend more time playing video games and using computers.

- *Parents' education*. The more educated parents are, the more likely they may be to have books available at home, to engage in reading, and to value reading. Therefore, children of more educated parents may read more. More parental education may enhance watching specific types of programs on television (perhaps educational programs) and using computers for educational purposes, and more parental education may be associated with less game playing on computers and less watching of noneducational television programs.

- *Race*. Past research has explored differences between racial groups in terms of exposure to various media. For example, Krosnick et al. (2003) found no relation of race with television viewing time in a sample of young and older children but found that non-Whites watched more television than Whites among high school seniors. Roberts and Foehr (2004) found this same relation of race with viewing among children between ages 2 and 18 (see also Bickham et al., 2003; Brown, Childers, Bauman, & Koch, 1990; Gentile & Walsh, 2002; McIntyre & Teevan, 1972; Tangney & Feshbach, 1988). We might see this race relation here as well.

- *Child's gender*. Some past research found that preschool boys watched TV and used computers more frequently than did preschool girls (Huston, Wright, Marquis, & Green, 1999). Studies have also found that boys spend more time playing video games than do girls (e.g., Bickham et al., 2003; Wright et al., 2001). Young boys may prefer video games with violent content, whereas girls may prefer games with educational content, and the greater availability of games with violent content may therefore encourage boys to play video games. We may find similar associations in our analyses.

- *Child's age*. With increasing age comes an increasing ability to process complex information from electronic media and to manipulate interactive media. But at ages 5 and 6, many children spend increasing amounts of time in school, which may limit time available for media use. Past studies have found that children's TV viewing time increased steadily from infancy through age 6 (the time of entry into school), after which TV viewing declined (e.g., Comstock, 1991; Huston et al., 1999; Timmer, Eccles, & O'Brien, 1985). We may find a similar curvilinear relation between exposure to various media and child age.

- *Parents' age*. Older parents may be more traditional in their approaches to child rearing and less open to involvement of new media in family activities. Therefore, children of these parents might be more exposed to books and television and may spend less time with video games and computers.

- *Number of parents living in the household*. Whether both parents are present in the household or only one parent is present might affect children's media exposure. Some studies have found that children in homes with absent fathers watched more TV than did children in homes with fathers present (Brown et al., 1990; Medrich et al., 1982), perhaps because fathers occupy time in social interaction with children that is replaced by viewing. Similarly, Gentile and Walsh (2002) found that children of married parents watched less TV than did children of single parents. Another possibility is that in families with only one parent, there are fewer rules restricting TV viewing, yielding more time spent with TV (Brown et al., 1990). However, parents and children sometimes watch television together, yielding a positive relation between time spent with family and amount of television viewing

(Kubey & Csikszentmihalyi, 1990). Therefore, children living with two parents might watch more TV.

- *Parents' employment status*. If parents spend more time away from home working, their children might be at home alone more often and might have less parental supervision at home. Brown et al. (1987, as cited in Lin & Atkin, 1989) found fewer rules restricting television viewing in families where the mother was employed and also found that fewer rules were associated with more TV viewing. Thus, children living in households with employed parents might watch more TV and use other media more as well. But there is also evidence that among preschool children, maternal employment is related to less time watching television (Bianchi & Robinson, 1997; Pinon, Huston, & Wright, 1989; Timmer et al., 1985).

STUDY OVERVIEW

Between April and June of 2003, a nationally representative sample of 1,065 parents was interviewed by telephone about the media-use behavior of a target child in their household between age 6 months and 6 years old. These data were collected by Princeton Survey Research Associates on behalf of the Kaiser Family Foundation.

To select the target child, the interviewer randomly asked about either the respondent's youngest or oldest child who was 6 months to 6 years of age.

Questions measured the time the child spent on the day prior to the day of the interview or on a typical recent day (a) watching television, (b) watching videos/ DVDs, (c) reading or being read to, (d) playing X-box type video games, (e) playing handheld video games (such as Gameboy), (f) using a computer for playing games, and (g) using a computer for other purposes. These items served as the dependent variables (DVs) for the current study.

Information on the gender, age, and birth order of the selected child was acquired, as was information on the respondent's race, marital status, and age, the educational attainment of the respondent and his or her spouse/partner, the employment status of the respondent and his or her spouse/partner, household income, the language spoken in the household, and the day of the week when the interview was conducted. These measures served as the predictors in our analyses.

MEASURES AND CODING

DVs

Respondents were asked, "Was the amount of time you spent with your child yesterday typical for a [weekday/Saturday/Sunday] or not? [If not:] For the next series of questions, I'd like you to think back to the last day you and your child

followed your typical routine. What day of the week was that?" This question sequence was used to determine how the media-use questions would be asked.

All the media-use questions listed below were preceded by the following stem: "We're interested in what kinds of things [target child] did [yesterday/on the last day you followed your typical routine]. As best you can recall, please tell me which, if any, of the following activities your child did [yesterday/on that day]." If the child was younger than 3 years, respondents were told, "If it is something your child is too young to do, just tell me and I'll move on to the next item."

Respondents were asked, "Did your child spend any time watching TV [yesterday/on that day]? [If yes:] We're interested in how much time your child spent doing these activities [yesterday/on that day]. About how much time did your child spend watching TV [yesterday/on that day]?"

These same questions were also asked about "watching videos or DVDs," "reading or being read to," "playing video games like X-Box or Playstation," "playing handheld video games like Gameboy," "playing computer games," and "using a computer for something other than games."

Responses to all questions were recorded in these categories: did not do so/ too young to do so (coded 0), 5 minutes (coded 5), 15 minutes (coded 15), 30 minutes (coded 30), 45 minutes (coded 45), 1 hour (coded 60), 1.5 hours (coded 90), 2 hours (coded 120), 2.5 hours (coded 150), 3 hours (coded 180), 3.5 hours (coded 210), 4 hours (coded 240), 4.5 hours (coded 270), 5 hours (coded 300), 5.5 hours (coded 330), 6 hours (coded 360), 6.5 hours (coded 390), 7 hours (coded 420), 7.5 hours or more (coded 450).

We summed responses to the two questions about video games and handheld video games to yield a measure of the total time spent playing video games. And the two measures of time spent using computers were summed to index the total amount of time spent using computers.

PREDICTORS

Child's gender. The gender of the target child was coded 0 for girls and 1 for boys.

Child's age. The age of the child was recorded in one of the following categories: 6 months to 11 months; 1 year; 2 years; 3 years; 4 years; 5 years; 6 years. These were coded 0, 1, 2, 3, 4, 5, and 6, respectively.

Race. Race was represented by three dummy variables. For the first variable, African Americans were coded 1, and all other respondents were coded 0. For the second variable, Hispanics were coded 1, and all other respondents were coded 0. For the third variable, Whites, African Americans, and Hispanics were coded 0, and people of all other races were coded 1.

Birth order. "Thinking about all the children under age 18 who live with you, is [target child] the youngest child, the oldest child, or a middle child?" Responses were represented by three dummy variables. For the first, oldest children were coded 1, and all others were coded 0. For the second, middle children were coded 1, and all others were coded 0. And for the third, youngest children were coded 1, and all others were coded 0.

Language spoken at home. "Is any language other than English spoken in your household?" Respondents who answered no were coded 1, and all others were coded 0.

Father's and mother's education. Respondents were asked, "What is the last grade or class that you completed in school?" The response categories were none or Grade 1 to 8; some high school (Grades 9 to 11); high school graduate (Grade 12 or general equivalency diploma certificate); business, technical, or vocational school after high school; some college, no 4-year degree; college graduate (B.S., B.A., or other 4-year degree); and postgraduate training or professional schooling after college (e.g., toward a master's degree or Ph.D., law or medical school). Respondents also reported their spouse's or partner's education: "What is the last grade or class your [husband/wife/partner] completed in school?"

Responses to these two questions, in conjunction with information about the gender of the respondent, were used to create two variables that represented father's education and mother's education. If the respondent was male, his answer to the respondent's education question was treated as the father's education, and his answer to the spouse/partner's education question was treated as the mother's education. If the respondent was female, her description of her education was treated as the mother's education, and her answer to the spouse/partner's education question was treated as the father's education.

Father's and mother's education were each represented by six dummy variables. For the first, respondents in the some high school category were coded 1, and all others were coded 0. For the second, respondents in the high school graduate category were coded 1, and all others were coded 0. For the third, respondents in the business, technical, or vocational school after high school category were coded 1, and all others were coded 0. For the fourth, respondents in the some college, no 4-year degree category were coded 1, and all others were coded 0. For the fifth, respondents in the college graduate category were coded 1, and all others were coded 0. For the sixth dummy variable, respondents in the postgraduate category were coded 1, and all others were coded 0.

Father's and mother's employment. Respondents were asked "Are you now employed full-time, part-time, are you retired, or are you not employed for pay?" and "Is your husband/wife or partner now employed full-time, part-time,

retired, or not employed for pay?" Responses to these two questions, in conjunction with information about the gender of the respondent, were used to create two variables that represented father's employment and mother's employment. If the respondent was male, answers to the respondent's employment question were treated as father's employment, and answers to the spouse/partner's employment question were treated as mother's employment. If the respondent was female, answers to the respondent's employment question were treated as mother's employment, and answers to the spouse/partner's employment question were treated as father's employment.

Father's employment was represented by three dummy variables. For the first, fathers employed full-time were coded 1, and all others were coded 0. For the second, fathers employed part-time were coded 1, and all others were coded 0. For the third, retired fathers were coded 1, and all others were coded 0. Three comparable dummy variables were created to represent mother's employment.

Parent's age. Respondents indicated their year of birth, and age was calculated using answers to that question. The ages of respondents ranged from 18 to 67 years.

Respondent's marital status. "Are you married, living as married, divorced, separated, widowed, or have you never been married?" Responses to this question were represented by five dummy variables. For the first, respondents living together as married were coded 1, and all others were coded 0. For the second, divorced respondents were coded 1, and all others were coded 0. For the third, separated respondents were coded 1, and all others were coded 0. For the fourth, widowed respondents were coded 1, and all others were coded 0. For the fifth, respondents who were never married were coded 1, and all others were coded 0.

Income. "Last year, in 2002, what was your total household income from all sources, before taxes? Just stop me when I get to the right category: Less than $10,000, $10,000 to under $20,000, $20,000 to under $30,000, $30,000 to under $50,000, $50,000 to under $75,000, $75,000 to under $100,000, $100,000 or more." Each category was represented by the average number of dollars for the interval: 5,000, 15,000, 25,000, 40,000, 62,500, 87,500, and 132,000, respectively.[1] To express these values in units of 100,000, they were divided by 100,000: .05, .15, .25, .40, .625, .875, and 1.32, respectively. This division was performed so that the resulting unstandardized regression coefficients would be easier to interpret (because otherwise, they would have been extremely small).

Language of the interview. The interviewer recorded whether the interview was conducted in English or in Spanish. This variable was coded 0 if the interview was conducted in Spanish and 1 if the interview was conducted in English.

Day of the interview. The day of the week on which the interview was conducted was represented by six dummy variables. For the first, people interviewed on a Tuesday were coded 1, and all others were coded 0. For the second, people interviewed on a Wednesday were coded 1, and all others were coded 0. For the third, people interviewed on a Thursday were coded 1, and all others were coded 0. For the fourth, people interviewed on a Friday were coded 1, and all others were coded 0. For the fifth, people interviewed on a Saturday were coded 1, and all others were coded 0. For the sixth, people interviewed on a Sunday were coded 1, and all others were coded 0.

ANALYSIS STRATEGY

Regressions to gauge the shapes of bivariate relations. We conducted bivariate regressions to gauge whether each of the continuously coded predictors (child's age, parent's age, and income) had a quadratic or cubic relation with each of the media-use DVs. We could simply have tested for linear effects of these variables, but this would have run the risk of overlooking nonlinear relations that might have existed. For example, we outlined earlier why child's age might manifest a nonlinear relation with use of some media, rising with age from 0 to the start of school and dropping thereafter. It therefore seemed sensible to allow for the possibility of nonlinear relations of all continuous predictors with media use.

We estimated the parameters of Equation 1 to assess whether a predictor had a quadratic relation with each media-use DV:

$$\text{Media use} = b_0 + b_1 \,(\text{Predictor}) + b_2 \,(\text{Predictor})^2. \tag{1}$$

Equation 2 assessed whether a predictor had a cubic relation with each media-use DV:

$$\text{Media use} = b_0 + b_1 \,(\text{Predictor}) + b_2 \,(\text{Predictor})^2 + b_3 \,(\text{Predictor})^3. \tag{2}$$

If b_3 was statistically significant in Equation 2, the predictor was said to have a cubic relation with media use. If this term was not significant, we estimated the parameters of Equation 1. If b_2 was significant in Equation 1, the predictor was said to have a quadratic relation with media use. If this term was not significant, we represented the predictor with linear coding.

If the predictor had a quadratic relation with the media-use DV, the squared term representing the predictor was entered into the final regression equation along with the predictor coded linearly. If the predictor had a cubic relation with media use, then the squared and cubed terms representing the predictor were

entered into the final regression equation along with the predictor coded linearly.

Multivariate regressions. The frequency distributions of the media-use variables indicated that they had many respondents with 0 time spent and a few respondents who spent very large amounts of time with each medium. To explore whether the shapes of these distributions affected our results, we conducted two sets of OLS regressions predicting (a) the number of minutes spent using each medium and (b) the natural log of the amount of time spent using each medium.[2] All predictors were entered simultaneously. Child's age, parent's age, and income were represented as continuous variables. Child's gender, race, birth order, language spoken at home, father's education, mother's education, father's employment, mother's employment, respondent's marital status, language of the interview, and day of the interview were represented by dummy variables. The data were weighted to enhance demographic correspondence with the population.

The results we obtained by predicting the untransformed and log-transformed media-use variables were very similar, but as would be expected, a few effects that were nonsignificant predicting the untransformed DVs were significant when predicting the transformed DVs. We therefore report the coefficients obtained with the untransformed DVs (because they are easy to interpret) and the significance levels obtained with the transformed DVs (which we believe are more accurate).

RESULTS

Watching television. Time spent watching television steadily increased as child's age increased up to 4 years, after which it declined ($b = 21.27$, $p < .01$, and $b = -3.00$, $p < .01$, for the linear and squared terms, respectively; see Table 1, Column 1, and Figure 1). White children watched less television than Black children ($b = 23.14$, $p < .01$).

Children of fathers with less education watched more television (postgraduate, $b = -26.70$, $p < .10$; see Figure 2). Children of mothers with less education also watched more television (college graduate, $b = -26.48$, $p < .10$; see Figure 3). Children of fathers who worked part-time watched less television than did children of unemployed fathers ($b = -2.37$, $p < .10$). But children of retired fathers and mothers watched more television than did children with fathers/mothers who were unemployed ($b = 13.59$, $p < .05$, and $b = 62.74$, $p < .01$, respectively). Children living with a divorced parent or a parent who never married spent less time watching TV than children living with married adults ($b = -32.75$, $p < .01$, and $b = -18.92$, $p < .05$).

Respondents interviewed in English reported more time spent watching TV than did respondents interviewed in Spanish ($b = 31.21$, $p < .05$).

TABLE 1: Unstandardized Regression Coefficients Assessing the Associations of Demographic Characteristics With Time Spent Using Various Media

Predictor	Minutes Spent Using Various Media				
	Television Watching	Watching Videos/DVDs	Reading	Playing Video Games	Using Computers
Child gender (comparison group: girl)					
Boy	2.89	4.28	−1.78	6.29***	1.20
Child age					
Child age	21.27***	8.15****	2.34***	−6.26**	3.26***
Child age squared	−3.00****	−1.42***		3.84***	
Child age cubed				−0.43***	
Race (comparison group: White)					
Black	23.14***	2.34	3.65**	1.75	5.98
Hispanic	13.69	−3.41	−6.65*	6.29	7.09
Other race	25.49	−2.97	−4.63	−0.84	5.29
Birth order (comparison group: only child)					
Oldest	11.04	8.68	−7.67	−4.31	1.35
Middle	−6.17	1.51	−3.94**	6.46	7.82*
Youngest	0.20	4.98	−5.96	0.64	−0.01*
Language spoken at home (comparison group: English and/or another language)					
English only	8.20	2.95	−13.64*	−0.62	1.96
Father's education (comparison group: no education/Grades 1 to 8)					
Some high school	−7.64	20.09**	8.66	9.19***	7.76
High school graduate	−5.11	14.03	5.64	3.90	3.21
Business/technical/vocational school	−4.83	33.80***	−3.13	−1.63	1.99
Some college	−13.38	19.64**	11.37	7.91*	5.50*
College graduate	−18.40	15.32*	16.80	6.35*	3.82**
Postgraduate	−26.70*	5.07	10.26	4.90	3.68

Mother's education (comparison group: no education/Grades 1 to 8)					
Some high school	1.93	12.98	-17.95*	-6.46	-8.06
High school graduate	-17.12	9.47	-11.01	0.83	-5.06
Business/technical/vocational school	-18.65	-2.69	-15.74	7.51	3.22
Some college	-27.64	11.89	-3.46	-2.67	-5.27
College graduate	-26.48*	6.30	1.47	-0.28	-2.73
Postgraduate	-23.78	12.86	-2.44	-4.07	-4.52
Father's employment (comparison group: not employed)					
Full-time	4.03	-2.63	-24.18***	-5.14	-6.11*
Part-time	-2.37*	-8.53	4.90	0.74	-0.01
Retired	13.59**	13.18	-31.22*	-3.32	1.89
Mother's employment (comparison group: not employed)					
Full-time	-6.36	-3.94	-4.91	-5.27***	1.66
Part-time	-5.31	1.90	1.85	-2.23	5.57
Retired	62.74***	41.44***	-6.75	-10.41***	-12.30***
Parent age					
Parent age	0.27	-0.80**	-0.24	-0.01	-0.09
Respondent marital status (comparison group: married)					
Living together as married	-10.21	-15.37	15.15	2.84	-5.85
Divorced	-32.75***	-0.84	-17.49*	0.37	-6.14*
Separated	-8.00	22.49*	-7.47	2.92	-5.26
Widowed	45.55	12.20	-32.29***	55.76**	-7.00
Never married	-18.92**	7.72	-15.22	3.14	-3.88
Income	-7.83	-2.38	-9.95	-1.31	0.02
Language of the interview (comparison group: Spanish)					
English	31.21**	5.32	20.59	8.20*	11.80
Day of the interview (comparison group: Monday)					
Tuesday	18.87***	-9.26	6.25**	5.56**	1.39

(continued)

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TABLE 1 (continued)

	Minutes Spent Using Various Media				
Predictor	Television Watching	Watching Videos/DVDs	Reading	Playing Video Games	Using Computers
Wednesday	12.92***	−16.17**	2.77***	5.25*	4.01
Thursday	16.62****	−1.07	−3.15	−1.01	0.44
Friday	23.05****	−4.16	−2.10	1.73	0.19
Saturday	25.75****	−1.29	−0.28	1.95	−0.49
Sunday	6.94	9.48*	−2.83	3.30*	2.74
Constant	9.42	33.58	61.50	−10.03	−10.59
R^2	0.12	0.07	0.11	0.17	0.09
n	926	931	941	945	944

*$p < .10$. **$p < .05$. ***$p < .01$. (All based on log-transformed dependent variable.)

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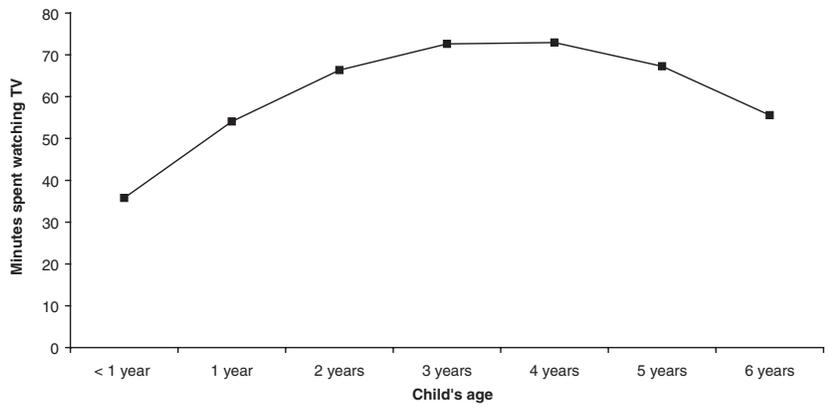
Figure 1:   The Relation of Child's Age With Minutes Spent Watching Television
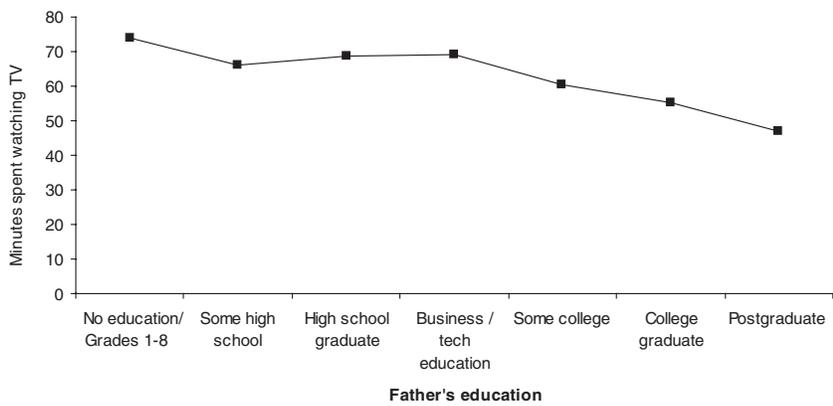

Figure 2: The Relation of Father's Education With Minutes Spent Watching Television

Watching videos/DVDs. Time spent watching videos/DVDs steadily increased as child's age increased to 3 years, after which it declined ($b = 8.15$, $p < .01$, and $b = -1.42$, $p < .01$, for the linear and squared terms, respectively; see Table 1, Column 2, and Figure 4).

Children of fathers with moderate levels of education watched more videos/DVDs than did children of fathers with the most education or the least education (some high school, $b = 20.09$, $p < .05$; business/technical/vocational schooling, $b = 33.80$, $p < .01$; some college, $b = 19.64$, $p < .05$; college graduate, $b = 15.32$, $p < .05$; see Figure 5).
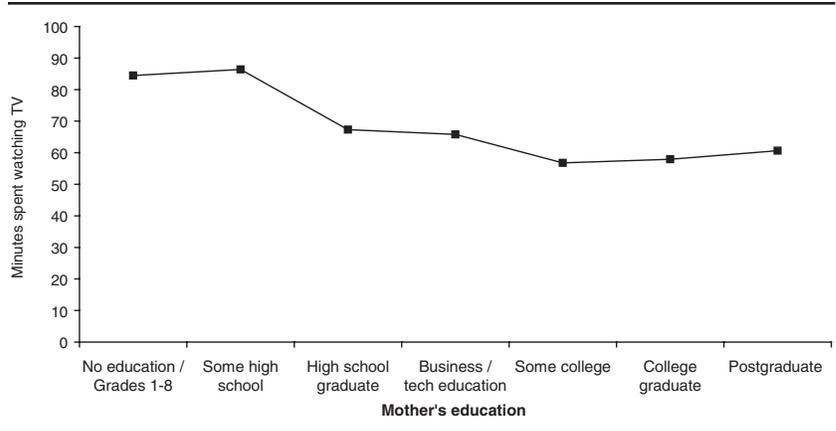
Figure 3:   The Relation of Mother's Education With Minutes Spent Watching Television
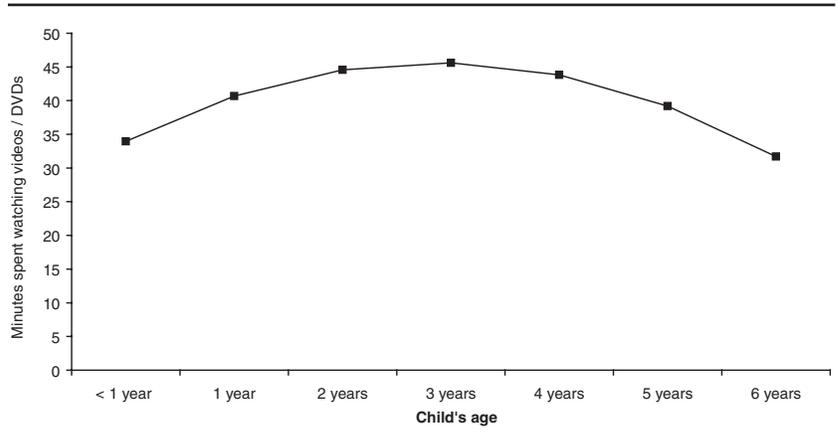

Figure 4:   The Relation of Child's Age With Minutes Spent Watching Videos/DVDs

Children of retired mothers watched more videos/DVDs than did children with mothers who were unemployed ($b = 41.44$, $p < .01$).

Children of older parents spent less time watching videos/DVDs ($b = -0.80$, $p < .05$).

Children living with a parent who was separated spent more time watching videos/DVDs than did children living with married adults ($b = 22.49$, $p < .10$).

Reading. Older children spent more time reading than did younger children ($b = 2.34$, $p < .01$; see Table 1, Column 3). Black children spent more time reading ($b = 3.65$, $p < .05$) and Hispanic children spent less time reading ($b = -6.65$,
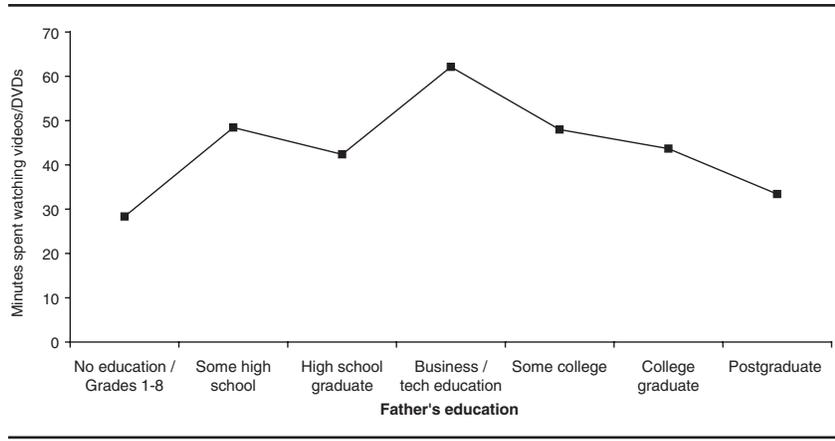
Figure 5: The Relation of Father's Education With Minutes Spent Watching Videos/DVDs
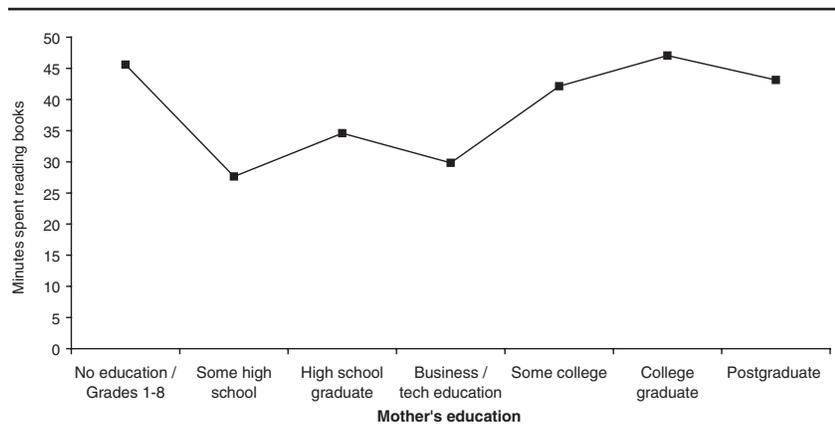

Figure 6: The Relation of Mother's Education With Minutes Spent Reading

$p < .10$) than did White children. Middle-born children read less than only children ($b = -3.94$, $p < .05$). Children who spoke only English at home read less than children who spoke another language at home in addition to or instead of English ($b = -13.64$, $p < .10$).

Time spent reading was lower for children whose mothers had moderate levels of education than for children with more-educated or less-educated mothers (some high school, $b = -17.95$, $p < .10$; see Figure 6).

Children whose fathers were employed full-time or retired spent less time reading than children with unemployed fathers ($b = -24.18$, $p < .01$, and $b = -31.22$, $p < .10$, respectively).
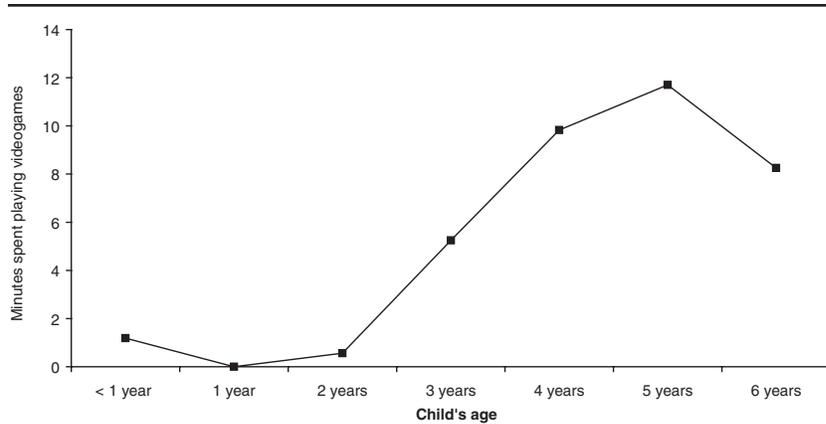
Figure 7:   The Relation of Child's Age With Minutes Spent Playing Video Games
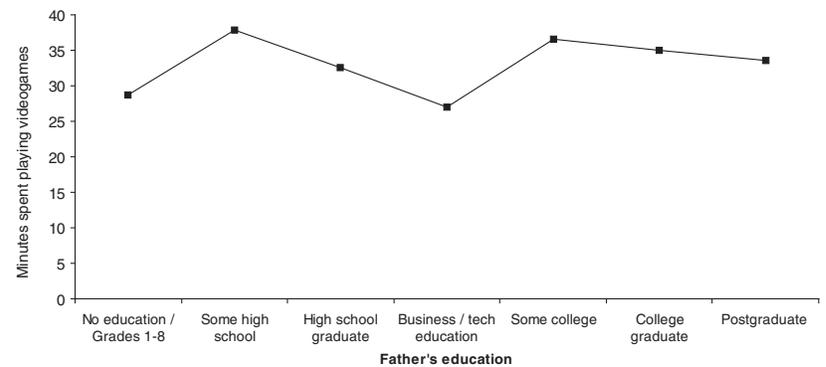

Figure 8:   The Relation of Father's Education With Minutes Spent Playing Video Games

Children living with parents who were divorced or widowed spent less time reading than did children living with married adults ($b = -17.49$, $p < .10$, and $b = -32.29$, $p < .01$, respectively).

Playing video games. Boys spent more time playing video games than did girls ($b = 6.29$, $p < .01$). Time spent playing video games increased from age 2 to age 5 and decreased at age 6 ($b = 6.26$, $p < .05$; $b = 3.84$, $p < .01$; and $b = -0.43$, $p < .01$, for the linear, squared, and cubed terms, respectively; see Table 1, Column 4, and Figure 7).

Children of fathers with the highest levels of education and who had some high school education but no degree spent more time playing video games than did the other groups (some high school, $b = 9.19$, $p < .01$; some college, $b = 7.91$, $p < .10$; college graduate, $b = 6.35$, $p < .10$; see Figure 8).

Children whose mothers were employed full-time or retired spent less time playing video games than children whose mothers were unemployed ($b = -5.27$, $p < .01$, and $b = -10.41$, $p < .01$, respectively). Children living with married adults spent less time playing video games than did children living with a widowed parent ($b = 55.76$, $p < .05$).

Respondents interviewed in English reported more time playing video games than did respondents interviewed in Spanish ($b = 8.20$, $p < .10$).

Using computers. Older children spent more time using computers ($b = 3.26$, $p < .01$; see Table 1, Column 5), middle-born children spent more time using computers ($b = 7.82$, $p < .10$), and last-born children spent less time using computers ($b = -0.01$, $p < .10$), as compared to only children.

Children of fathers with some college education or who were college graduates spent more time using computers than did children with fathers who had no high school education (some college, $b = 5.50$, $p < .10$; college graduate, $b = 3.82$, $p < .05$).

Children whose fathers were employed full-time spent less time using computers than did children whose fathers were unemployed ($b = -6.11$, $p < .10$). And children whose mothers were retired spent less time using computers than did children whose mothers were unemployed ($b = -12.30$, $p < .01$).

Children living with a parent who was divorced spent less time using computers than did children living with married adults ($b = -6.14$, $p < .10$).

DISCUSSION

CONCLUSIONS

We can draw a series of conclusions about the demographic predictors of media use among very young children using our results. We focus here on the relations that are of greatest interest either because of their relevance to the findings of past research or because of the theoretical explanations they invoke.

Child age. Probably the clearest and strongest story here involves child's age, which was a significant predictor of use of every medium. As children aged from 6 months to 3 to 5 years, they increased their use of all media. This is presumably a reflection of their growing mastery at comprehending incoming information and at manipulating interactive media. In fact, reading and computer use, the two activities that required the most skill, consistently increased with increasing age up until age 6, presumably an indication both of growing mastery and the cognitive rewards that come from these activities. And these are the only two activities we investigated that are required as a part of normal schooling, so 6-year-olds beginning first grade would find themselves encouraged to continue reading and using computers. The declines in use of television,

videos/DVDs, and video games presumably occurred because of declining interest in the subject matter, growth of the set of competing activities in which a child can participate as he or she gets older, and the fact that first-grade education does not normally encourage use of such media.

Income. Perhaps equally striking, income had no impact on the use of media. This lack of impact is interesting partly because it suggests income itself does not stratify society in terms of access to or use of potentially educational media for very young children, nor does it stratify society in terms of exposure to potentially harmful effects of some media. This finding is also surprising, because other investigations find that low income is associated with more television viewing (e.g., Comstock & Scharrer, 1999, 2001; Gentile & Walsh, 2002; Hagborg, 1995; Medrich et al., 1982; although Krosnick et al., 2003, did not find this relation). We did find income to be significantly negatively correlated with television viewing when no control variables were entered in the regression—it was only when the other demographics were treated as predictors as well that the significant relation became nonsignificant. This suggests that any association between income and television viewing may be either (a) mediated by other variables in our equation or (b) spurious, due to income and some other predictor(s) of viewing having common causes. The predictors of television viewing most likely to be correlated with income and responsible for observed associations are father's and mother's education, which are significantly and negatively associated with viewing. Income was negatively correlated with playing video games, but this relation disappeared in the regressions as well. Mediation or spuriousness could explain this relation as well.

Income was completely unrelated to time spent watching videos/DVDs, time spent reading, and time using computers. Perhaps access to videos is so universal that low family income does not limit access or use. But it is harder to imagine that low income is not associated with more limited regular access to computers. Of course, low-income children may have access to computers via public libraries or day care centers. Nonetheless, the lack of a relation here between income and computer use seems surprising.

Child gender. Striking as well is the near complete absence of gender effects on media use. Consistent with widely held stereotypes, very young boys played video games more than very young girls. This may partly reflect the fact that most video games are tailored to the activity tastes of boys more than girls. But we found no evidence of gender stratification in terms of television viewing, watching videos/DVDs, reading, or computer use. The lack of a gender correlation with television use is consistent with Krosnick et al.'s (2003) study of children aged 2 to 17, although Krosnick et al. did find that high school senior boys watched more television than high school senior girls. This suggests that a divide between males and females in terms of television viewing may emerge somewhere between the very young ages and the end of high school. It may be

worth investigating when and why this gender gap emerges. Likewise, it seems likely that girls overtake boys in terms of time spent reading by the end of high school, yet this gender gap is not apparent among the youngest children. So investigating the time in the developmental cycle of and the explanation for its emergence seems worthy of future investigation.

Race. Black children watched more television than White children and spent more time reading than White children. Hispanic children spent less time reading than did White and Black children and children of other races. These relations may be due to differences in culture-based views of the value of particular media or the appropriateness of the use of various media.

Parents' education. Past research has found a negative relation of parents' education with children's television viewing among a sample aged 2 to 17 (Bickham et al., 2003; Gentile & Walsh, 2002); research has also found that high school seniors whose parents had less education watched more television (Krosnick et al., 2003). Likewise, in the present data, very young children with less-educated mothers and fathers watched more television. Thus, perhaps the values that more educated parents bring to child rearing lead them to discourage television viewing more and to advocate other activities instead, beginning at a very young age.

Moderate levels of education for fathers was related to more time spent watching videos/DVD, less time playing video games, and less time using computers. We do not see apparent explanations for these relations.

Children of mothers with some high school education spent less time reading or being read to than children of mothers with less or more education. It is not surprising that more educated mothers had children who read more, but it is surprising that children of the least-educated mothers read more as well. Mothers' education was not related to use of other media.

Parental employment. Full-time employment by fathers was associated with less time spent reading and using computers. Children with retired fathers spent less time reading and more time watching TV, whereas children with part-time employed fathers spent less time watching TV. Full-time employment by mothers was associated with less time spent playing video games, and children with retired mothers spent more time watching TV and videos/DVDs and less time playing video games and using computers. These relations do not invite obviously plausible explanations.

Marital status. Children living with married adults spent more time watching TV, reading or being read to, and using computers than children living with adults of some other marital statuses. But children living with married adults spent less time watching videos/DVDS and playing video games than parents of some other marital statuses. Most of these effects are consistent with the

possibility that the absence of one parent (due to being divorced, separated, widowed, or never married) leads to more complex lifestyles and therefore less time in a single location simpatico with media use.

Language of the interview. Respondents interviewed in English reported more use of TV and video games than did respondents interviewed in Spanish. This may be a reflection of the fact that these media are more available in the United States in English than in Spanish. So if Spanish is a child's primary language, it may be more difficult for him or her to acquire media resources to use easily.

CAVEAT REGARDING MEASUREMENT OF MEDIA USE

It seems important to place these findings in context by noting that the media-use measures that served as our DVs have some potential drawbacks. Presumably, the goal of this measurement exercise was to differentiate children in terms of the total amount of time they devoted to using various media during long time periods. Expressed crudely, some children are heavy users, some are moderate users, and some are light users of each medium. Categorizing children thusly would require measuring the total amount of time spent using various media during, say, a month or a year.

Instead of asking a global question about time use during a long period, our questionnaire asked about the amount of time spent using various media on the last day when "you" (i.e., the respondent) "followed your typical routine." A prior question had said, "For the next series of questions, I'd like you to think back to the last day you and your child followed your typical routine." So if a respondent remembered that instruction when hearing the media-use questions, he or she may have interpreted "your typical routine" as referring to both the respondent and the child. But it is also possible that a respondent interpreted the media-use question literally and selected the most recent day when the respondent followed his or her typical routine, regardless of whether the child did so. Furthermore, the media-use questions asked either about yesterday or "the last day you followed your typical routine" depending on respondents' answers to this question sequence: "Was the amount of time you spent with your child yesterday typical for a [weekday/Saturday/Sunday] or not? [If not:] For the next series of questions, I'd like you to think back to the last day you and your child followed your typical routine. What day of the week was that?" This question sequence seems to determine typicality of routine based on whether the amount of time the respondent spent with the child was typical for that day of the week. This is, of course, only one of many ways that typicality could be determined. Most obviously, it may have been preferable to ask about whether the child's time use was typical for him or her, rather than asking about whether the amount of time spent by the parent and child together was typical. Another possible drawback of this questioning approach is that if a child did not happen to spend

any time using a particular medium on the selected day but was a regular user of that medium, his or her time use score would be 0.[3] We therefore look forward to future research exploring the same issues with other media-use measures to assess convergence of findings.

NOTES

1. Responses to a question on household income for the past 12 months was obtained from the U.S. Census Bureau's March 2003 *Current Population Survey*, and the median income value for households with incomes of more than U.S.$100,000 was calculated to be U.S.$132,000. Based on these data, the average income for the final income category of 100,000+ was designated as U.S.$132,000.

2. We also conducted Tobit regressions to analyze these skewed data. The results of the Tobit analyses were largely similar to the results reported in this article.

3. Another reason for slight hesitation about the results reported here involves the measurement of birth order. The interviewer's procedure for selecting a target child was to randomly select either the oldest child between ages 6 months and 6 years or the youngest child in that age range. This means that for families with more than two children in this age range, the middle-born children had a 0 probability of being selected for measurement. This causes a distorted distribution of birth order. Further complication is caused by the fact that the birth order question asked, "Thinking about all the children under age 18 who live with you, is [insert name] the youngest child, the oldest child or a middle child?" This means that birth order for the target child was measured only relative to children younger than age 18. In the families in which the first-born child was older than age 18, this would have led to mischaracterization of the birth order of the target child.

Also worth considering is a potential effect of respondents' employment status on reporting accuracy. Respondents who are employed part-time or full-time probably spend more time away from their children than respondents who are not thusly employed. Employed respondents' children are more likely to be in the care of other family members or of professional caretakers than children of parents who are not employed and therefore not necessarily as frequently away from home. As a result, descriptions of child media exposure may be less accurate when provided by employed respondents, and these respondents may be wishful thinkers and therefore systematically distort their reports in socially desirable directions. For example, employed parents may systematically underreport their children's television exposure if they view such exposure as undesirable or if they are simply not aware of all the television watching that the children do when the employed parent is away from home at work. This is worth bearing in mind when interpreting the effects we observed of parental employment status.

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