

How Low-Income Children Use the Internet at Home

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HomeNetToo is a longitudinal field study designed to examine home Internet use by low-income families in the United States. Participants were 140 children, mostly African American, whose Internet use was continuously and automatically recorded for one year. This article focuses on relationships between children's main computer activities, academic interests, career aspirations, social engagement, and their Internet use. Results indicated that children used their computers mainly to play games and search the Web. Using the computer to listen to music or to e-mail was related to greater Internet use whereas using it for schoolwork was related to less Internet use. Children whose academic interest was social science used the Internet more than did children whose interest was mathematics or science. Children who aspired to careers in the professions or computing used the Internet more than did children who aspired to careers in sports, entertainment, or human services. Internet use was unrelated to social engagement. Academic performance could not explain relationships between main computer activity, academic interest, career aspirations, and Internet use. Implications for research on children's beliefs about the Internet and their influence on Internet and technology use are discussed.

HomeNetToo is a longitudinal field study designed to examine the antecedents and consequences of home Internet use in low-income families (NSF-ITR #085348, <http://www.msu.edu/user/jackso67/HomeNetToo/>). Participants were 140 children, most of whom were African American

(83%), male (58%), and living in single-parent families (75%) in which the median household income was less than \$15,000 (USD) per year. Internet use was automatically and continuously recorded. Children completed surveys at multiple points during the 16-month project. Among the survey items were questions about how they used their computers, their academic interests, career aspirations, and social engagement. This article focuses on relationships between children's answers to these questions and their Internet use.

Survey research on children and computing indicates that children use home computers for a variety of purposes, including leisure activities (e.g., game playing, web surfing) and schoolwork (Pew Internet and American Life Project, 2000a, 2000b, 2002; Shields & Berman, 2000). However, only a handful of studies have examined how children use the Internet at home. Some findings suggest that children use the Internet primarily for schoolwork (i.e., searching the Web for information for school projects), followed by communication with peers (i.e., e-mail, instant messaging, and chat; Kraut, Scherlis, Mukhopadhyay, Manning, & Kiesler, 1996; Pew Internet and American Life Project, 2002; Turow & Nir, 2000; UCLA Internet Reports, 2000, 2001, 2003). More recent findings suggest that the main computer activities for children are playing games and searching the Web (Jackson, Biocca, et al., 2004). Moreover, the extent of children's Internet use for communication is uncertain (Becker, 2000; Cho, Gil de Zuniga, Rojas & Shah, 2003; Facer & Furlong, 2001; Gorski, 2002). The only study to automatically record Internet use was conducted in 1995-1996. Findings based on the combined sample of adults and children indicated that although participants reported that e-mail was a very important reason for going online, they actually sent less than one e-mail a week (Kraut et al., 1996). Consistent with these findings, Jackson, Biocca, et al. (2004) found very little e-mail use by HomeNetToo children when automatically recorded measures of Internet use were considered.

Absent from the research are studies of relationships between children's academic interests, career aspirations, and their Internet use. There is reason to expect such relationships (Jackson, vonEye, Biocca, et al., 2004; Rochelleau, 1995; Wenglinsky, 1998; Woodard & Gridina, 2000; Yelland & Lloyd, 2001). Children interested in science, mathematics, and computing, and children oriented toward careers in these and related professions, are likely to use the Internet more than are children interested in other subjects and careers. Jackson, vonEye, Barbatsis, et al. (2004) reported preliminary findings contrary to this view. Children whose favorite school subject was social science used the Internet more than did children with other favorite school subjects (e.g., mathematics). Unfortunately these investigators did not examine the relationship between career aspirations and Internet use. Moreover, predicted relationships rest on the assumption that children recognize

the relevance of Internet use to their academic interests and career aspirations.

Studies of adults suggest a relationship between social engagement and Internet use (Katz & Rice, 2002; Kraut et al., 1998, 2002). However, some studies find a positive relationship – more social engagement is related to greater Internet use (UCLA Internet Reports, 2000, 2001, 2003; Katz & Rice), some find a negative relationship – more social engagement is related to less Internet use (Kraut et al., 1996; Nie & Erbring, 2000) and some find no relationship between the extent of Internet use and social engagement (Jackson, von Eye, Barbatsis, et al., 2004; Kraut et al., 1998; Kraut et al., 2002). Whether there is a relationship between social engagement and Internet use for children has yet to be systematically investigated.

The paucity of previous research suggests an exploratory approach to examining relationships between how children use their computers, their academic interests, career aspirations, social engagement, and Internet use. The following exploratory hypotheses were formulated:

Hypothesis 1: Children who use their home computers mainly for schoolwork will use the Internet more than will children who use them primarily for leisure activities (e.g., listening to music, communicating with peers).

Hypothesis 2: Children whose academic interests are mathematics or science will use the Internet more than will children whose academic interests are in other disciplines.

Hypothesis 3: Children aspiring to careers in the professions (e.g., doctor) or computing will use the Internet more than will children aspiring to careers in other fields.

Hypothesis 4: Children who are less socially engaged will use the Internet more than will children who are more socially engaged.

Also considered in this research were gender differences in main computer activities, academic interests, career aspirations, social engagement, and Internet use (Jackson, 2004; Jackson, Ervin, Gardner & Schmitt, 2001) and whether academic performance could explain relationships between these factors and Internet use (Jackson et al., in press).

METHODS

Participants and Procedures

Participants were 140 children residing with 120 adult participants in the HomeNetToo project. Adult participants were recruited at meetings held at the children's middle school and at the Black Child and Family Institute, Lansing, MI. Requirements for participation were that the child be eligible

for the federally-subsidized school lunch program, that the family had had a working telephone line for the previous six months, and that the family had never had home Internet access. Participants agreed to have their Internet use automatically and continuously recorded, to complete surveys at multiple points during the project, and to participate in home visits. In exchange they received home computers, Internet access, and in-home technical support during the Internet recording period (i.e., 16 months).

Adult participants were primarily African American (67%) and female (80%). The majority reported having some college education or earning a college degree (62%), making our sample much better educated than the typical low-income sample (e.g., UCLA Internet Report, 2000, 2001, 2003). Average age of adult participants was 38.6 years old. As noted earlier, child participants were primarily African American (83%), male (58%), and living in single-parent households (75%) in which the median household income was \$15,000 (USD) annually (49%). Average age was 13.8 years old.

Measure

Internet use. Four measures of Internet use were recorded continuously for the first year of the project: time online (minutes/day), number of sessions (log-ins per day), number of (unique) domains visited (per day) and number of e-mails sent (per day). To examine changes in relationships over time Internet use measures were divided into two time periods: time 1 (1 to 6 months) and time 2 (7 to 12 months).

Main computer activity. Children responded to the question: "What is the **main thing** you do when you use your home computer? Circle only one number. 1=Play games, 2=E-mail, 3=Search the Internet (Surf the Web), 4=Make documents (word processing, spreadsheets), 5=School work, 6=Listen to music, 7=Other."

Academic interests. Children's open-ended responses were obtained to the question "What is your favorite school subject?"

Career aspirations. Children's open-ended responses were obtained to the question "What kind of a job would you like when you're grown up?"

Social engagement. Children responded to three questions about their after-school activities: "Are you on a sports team?" (Yes/No). "Do you belong to any groups or clubs?" (Yes/No). "Do you have any hobbies or interests?" (Yes/No).

Academic performance. Children's grade point averages (GPAs) and scores on standardized tests of academic performance (Michigan Educational Achievement Program (MEAP) tests) were obtained from their schools (with parental permission). GPAs were obtained for Fall, 2000 (i.e., pre-trial), Spring, 2001 (i.e., six months into the project), Fall, 2001 (i.e., 12

months into the project), Spring, 2002 (i.e., posttrial). MEAP scores (reading and math) were obtained at the end of each academic year of the project (i.e., 2001 and 2002).

RESULTS

Frequency of Children's Internet Use

Children spent an average of 27 minutes per day online, participating in 0.6 sessions (i.e., they did not log on daily) and visiting 10 domains. They sent a negligible number of e-mails – less than one per week. Paired contrasts to examine changes in Internet use over time indicated very little change. Time online and number of e-mails sent remained the same throughout the project. Number of sessions decreased slightly but number of domains visited remained the same. Because the distributions of all 4 Internet use measures were highly skewed log transformations were used in all the analyses.

Children's Main Computer Activity and Their Internet Use

The main reasons that children used their computers were to play games (34%) and search for information on the Web (33%) followed, in roughly equal frequencies, by school work (11%), listening to music (11%), and e-mailing (8%). Making documents (3%) and other uses (0%) were rarely mentioned and were excluded from subsequent analyses.

Means for the four measures of Internet use for each main computer activity group are presented in Table 1. Analyses of variance (ANOVAs) and posthoc contrasts (LSD test) were used to examine differences in Internet use among the five main computer activity groups. According to Hypothesis 1, children who use their home computers mainly for schoolwork will use the Internet more than will children who use them primarily for leisure activities. Contrary to this hypothesis, children who used their computers mainly to listen to music spent more time online, $F(4, 120)=4.22, p<.05$, participated in more sessions, $F(4, 120)=3.98, p<.05$, and visited more domains, $F(4, 120)=4.41, p<.05$, than did children in any of the other main computer activity groups. In fact, children who used their computers mainly for schoolwork used the Internet less than did children in any other group. In addition, children who used their computers mainly for e-mail sent somewhat more e-mails than did other children, $F(4, 88)=2.05, p<.1$.

Relationships between main computer activity and Internet use were different during the second half of the year. Again contrary to Hypothesis 1, children who reported that e-mail was their main computer activity spent more time online, $F(4, 117)=3.61, p<.05$, engaged in more sessions, $F(4, 117)=3.09, p<.05$, visited more domains, $F(4, 113)=3.60, p<.05$, and sent more e-mails (LSD test) than did children in any of the other computer activ-

Table 1
Children's Main Computer Activity and Their Internet Use

	Time online (minutes/day)		Sessions (#/day)		Domains (#/day)		E-mails sent (#/day)	
	T1	T2	T1	T2	T1	T2	T1	T2
Play games	22.09	20.03	.45	.43	7.59	8.04	.03	.02
E-mail	33.67	75.67	1.15	1.22	13.12	19.46	.55	.14
Web search	30.90	31.05	.80	.52	13.07	10.90	.11	.20
Schoolwork	11.33	9.54	.37	.22	4.98	3.90	.02	.03
Listen to music	71.27	57.35	1.22	0.62	19.53	14.35	.11	.06

Note: T1 is Time 1: 1 to 6 months. T2 is Time 2: 7 to 12 months.

ity groups. Once again, children who used their computers mainly for schoolwork were least likely to use the Internet.

Chi-square analyses revealed gender differences in main computer activity ($\chi^2(4)=16.83, p<.001$). Boys were more than twice as likely as girls to report that playing games was their main computer activity.

There were no differences among the main computer activity groups in GPAs or MEAP scores. Thus, differences in academic performance cannot explain differences in Internet use among the main computer activity groups. Of the 12 measures of academic performance considered in these analyses, gender differences were obtained for one measure only. Girls' GPAs in Spring 2001 were higher (2.28) than boys' GPAs at that time (1.86, $F(1, 103)=5.78, p<.05$).

Children's Academic Interests and Their Internet Use

Children's responses to the question of what was their favorite school subject were coded into six categories. Mathematics was by far the most popular school subject (31%), followed in roughly equal frequencies by science (17%), literature (17%), and social science (15%). The categories gym (3%) and other (18%) were excluded from subsequent analyses, the former because it was infrequent and the latter because it was too ambiguous.

Means for the four favorite school subject groups are presented in Table 2. According to Hypothesis 2, children whose academic interests are mathematics or science will use the Internet more than will children whose academic interests are in other disciplines. In partial support of this hypothesis, at time 1, children whose favorite subject was science or social science spent more time online, $F(3, 138)=3.37, p<.05$, participated in more sessions, $F(3, 136)=3.35, p<.05$, and visited more domains, $F(3, 136)=4.18, p<.05$, than did children whose favorite subject was mathematics or literature. Children whose favorite subject was literature or social science sent more e-mails

Table 2
Children’s Favorite School Subject and Their Internet Use

	Time online (minutes/day)		Sessions (#/day)		Domains (#/day)		E-mails sent (#/day)	
	T1	T2	T1	T2	T1	T2	T1	T2
Science	41.89	22.58	.85	.48	14.74	8.30	.04	.06
Mathematics	20.95	20.36	.57	.35	8.47	7.50	.03	.01
Literature	23.16	50.24	.62	.54	7.00	10.84	.33	.42
Social science	48.49	81.26	1.01	1.25	17.44	21.76	.16	.15

Note: T1 is Time 1: 1 to 6 months. T2 is Time 2: 7 to 12 months.

than did children whose favorite subject was mathematics or science, $F(3, 120)=4.58, p<.05$.

Contrary to Hypothesis 2, at time 2, children whose favorite subject was social science spent more time online, $F(3, 115)=3.86, p<.05$, participated in more sessions, $F(3, 115)=4.86, p<.05$, and visited more domains, $F(3, 114)=4.52, p<.05$, than did children in any other favorite school subject group. Once again, children whose favorite school subject was literature or social science sent more e-mails than did children whose favorite subject was mathematics or science, $F(3, 89)=6.89, p<.05$.

Chi-square analyses revealed gender difference in children’s favorite school subject ($\chi^2(3)=8.20, p<.042$). Boys were more likely than girls to report that science was their favorite subject. Girls were more likely than boys to report that literature was their favorite subject.

There were no differences among the favorite school subject groups in GPAs or MEAP scores. Thus, differences in academic performance cannot explain differences in Internet use among children who differed in their favorite school subject.

Children’s Career Aspirations and Their Internet Use

Children’s responses to the open-ended question about career aspirations were coded into six categories: professions (e.g., doctor), 31%; sports (e.g., NBA player), 24%; human services (e.g., teacher) 19%, entertainment (e.g., rap singer), 13%; computing (e.g., technician), 11%; don’t know/other, 3%. The latter category was excluded from subsequent analyses.

Means for the ANOVAs are presented in Table 3. According to Hypothesis 3, children aspiring to careers in the professions (e.g., doctor) or computing will use the Internet more than will children aspiring to careers in other fields. Consistent with this hypothesis, at time 1, children who aspired to careers in the professions or computing spent more time online, $F(4,$

Table 3
Children's Career Aspirations and Their Internet Use

	Time online (minutes/day)		Sessions (#/day)		Domains (#/day)		E-mails sent (#/day)	
	T1	T2	T1	T2	T1	T2	T1	T2
Sports	21.71	40.39	.48	.37	6.82	7.41	.05	.01
Entertainment	32.52	44.59	.68	.41	11.72	8.79	.05	.03
Professions	43.31	39.85	1.07	.76	16.45	13.99	.09	.04
Human services	23.32	28.36	.58	.46	8.28	8.74	.07	.06
Computing	37.71	42.63	.82	.58	13.22	12.64	.19	.04

Note: T1 is Time 1: 1 to 6 months. T2 is Time 2: 7 to 12 months.

110)=3.79, $p < .05$, participated in more sessions, $F(4, 110)=4.78$, $p < .05$, and visited more domains, $F(4, 109)=4.93$, $p < .05$, than did children who aspired to careers in sports or human services. Children who aspired to computing careers also sent more e-mails than did those who aspired to careers in sports or human services (LSD test). Also consistent with Hypothesis 3, at time 2, children who aspired to professional and computing careers participated in more sessions, $F(4, 110)=2.96$, $p < .05$, and visited more domains, $F(4, 110)=2.98$, $p < .05$, than did children who aspired to careers in sports, entertainment or human services.

Boys and girls differed in their career aspirations ($\chi^2(5)=27.92$, $p < .001$). Boys were more likely to aspire to careers in sports and computing; girls were more likely to aspire to careers in entertainment.

ANOVAs to examine differences among the career aspiration groups in GPAs and MEAP scores revealed no differences. Thus, academic performance cannot explain career aspiration differences in Internet use.

Children's Social Engagement and Their Internet Use

Almost half (44%) of the HomeNetToo children were members of a sports team; 38% were members of a group or club; 86% had a hobby or interest. According to Hypothesis 4, children who are less socially engaged will use the Internet more than will children who are more socially engaged. ANOVAs indicated no differences in Internet use as a function of social engagement. Thus, whether or not a child was a member of a sports team, group or club, and whether or not a child had interests and/or hobbies was unrelated to how much the child used the Internet.

Boys were more likely to be members of a sports team than were girls ($\chi^2(1)=5.60$, $p < .05$); girls were more likely to have a hobby/interest than were boys ($\chi^2(1)=8.41$, $p < .01$). Being a member of a sports team, group or club, and having interests and/or hobbies were unrelated to academic performance.

DISCUSSION

Children in the HomeNetToo project used their computers mainly to play games and search for information on the Web. Contrary to Hypothesis 1, which states that children who use their computers mainly for schoolwork will use the Internet more than will children who use them mainly for leisure activities, during the first six months of home Internet access children who used their computers mainly for listening to music used the Internet more than did children who used them for other purposes (e.g., schoolwork). During the next six months, children who used their computers mainly for e-mail used the Internet most. In fact, throughout the year the children least likely to use the Internet were those who used their computers mainly for schoolwork. Relationships between main computer activity and Internet use were independent of academic performance, that is, there were no differences in the academic performance of children who differed in their main computer activities.

Relationships between main computer activity and Internet use have implications for how to encourage Internet and technology use in low-income children. They suggest that emphasizing the importance of the computer for schoolwork may actually discourage a playful exploration of the computer's value for other purposes, such as finding personally relevant information (e.g., web search) and communicating with others (e.g., e-mail). Children who perceive the computer as a "play tool" may develop better computer skills and more comfort with the technology than children who perceive it primarily as a "work tool." Thus, how the computer is introduced to children may be important in how they come to perceive and use it.

Children whose favorite school subject was science or social science used the Internet more during the first six months of home Internet access than did children whose favorite school subject was in other disciplines. During the next six months, children whose favorite school subject was social science continued to be the heaviest Internet users. These findings provide little support for Hypothesis 2, that children interested in mathematics and science would use the Internet more than would other children. There are at least two related explanations for the failure to support this hypothesis.

First, one of the main computer activities of HomeNetToo children was searching the Web. It may be that children whose academic interests are in social science believe that the Web contains more information of relevance to them than do children whose main academic interests are in mathematics or science.

A second and not incompatible explanation is that children whose academic interests are in mathematics or science may be spending just as much time on their computers as other children, but spending it in offline activities, such as playing games. Because we did not monitor computer use other than Internet use, we cannot evaluate this explanation directly. However, there is indirect support for it. Among the 28 children at one month and 18

children at post-trial whose main computer activity was playing games, 64% and 61% (respectively) said that science or mathematics was their favorite school subject. Server logs of other Internet activities suggested that HomeNetToo children engaged in very little online game-playing. Thus, those who reported playing games were playing offline.

Children's career aspirations were also related to their Internet use. Consistent with Hypothesis 3, children who aspired to careers in the professions (e.g., doctor) or computing used the Internet more than did children who aspired to careers in other fields (i.e., sports, entertainment or human services). As was the case for academic interests, career aspiration differences in Internet use may be attributable to beliefs about the relevance of information on Internet. Children aspiring to careers in sports, entertainment, and human services may believe that the Internet has less information of relevance to them than children aspiring to careers in the professions or computing. Although this explanation may seem implausible in light of the wealth of information on the Web, it gains plausibility when one considers the prototypic HomeNetToo child – a 13 year-old, African American male whose only prior experience with the Internet was in school.

Another explanation for the relationship between career aspirations and Internet use lies in children's beliefs about the personal relevance of technology itself. Children aspiring to careers in sports, entertainment, and human services may believe that technology, at least computer-based technology, is less relevant to their future professional roles than do children aspiring to careers in the professions or computing. The motivation to learn about and use computer-based technology may consequently be undermined in children aspiring to such careers.

Research is needed to test these explanations for relationships between academic interests, career aspirations, and Internet use. Children's beliefs about the information available on the Internet and its relevance to both their current academic interests and future professional roles need to be assessed. Educational interventions may be needed to inform children, especially low-income children, about the relevance and importance of technology in the information age to children of all academic and career interests.

The extent of children's social engagement, as reflected by participation in sports, groups, clubs, and hobbies, was unrelated to their Internet use, contrary to Hypothesis 4 and some previous research (Kraut et al., 1996), but consistent with evidence obtained in the HomeNetToo project for adults (Jackson, vonEye, Barbatsis, et al., 2004), and with research indicating that Internet use has no adverse social impact (Kraut et al., 1998; UCLA Internet Report, 2003). However, it is important to note that HomeNetToo children, like their parents, seldom used the Internet for communication (e.g., e-mail and chat; Jackson et al., 2003; Jackson, Biocca, et al., 2004), most likely because their friends and family were too poor to have Internet access at

home (Pew Internet and American Life Project, 2001a; U.S. Department of Commerce, 2000). Moreover, many parents of HomeNetToo children forbade them from participating in chat or other activities that involved contact with strangers online (Jackson, von Eye, Barbatsis, et al., 2004). Thus, with no friends or family to e-mail, and with chat activities and conversations with strangers explicitly forbidden, it is not surprising that HomeNetToo children made so little use of the Internet's communication tools.

Another explanation for children's infrequent use of the Internet's communication tools lies in cultural influences on communication preferences. The majority of the children in the HomeNetToo project were African American (83%), an historically "oral culture" (Hale, 1982). Recent evidence indicates that African Americans prefer face-to-face communication to a far greater extent than do Caucasian Americans (Helms & Parham, 1990). The impersonal nature of the Internet's communication tools (e.g., e-mail) may discourage African American children from using them. Perhaps as communication on the Internet becomes more enriched with oral and visual cues it may become more appealing to members of other cultures.

Overall, findings provided little support for three of the four hypotheses. Contrary to Hypothesis 1, children who used the Internet mainly for schoolwork did not use it more than did other children. Children whose primary academic interests were in science and mathematics did not use it more, contrary to Hypothesis 2. And children less socially involved did not use it more than did less socially involved children, contrary to Hypothesis 4. Only Hypothesis 3 received firm support. Children aspiring to careers in the professions or computing used the Internet more than did children aspiring to other careers. The overall lack of support for the research hypotheses speaks clearly to the need to develop new theoretical frameworks to guide research in children's technology use as well as the need to expand the empirical basis for such research.

A number of conclusions follow from our research. First, children who used their computers mainly for "fun" used the Internet more than did children who used them mainly for "work" (i.e., schoolwork). Second, children whose favorite school subject was social science used the Internet more than did children who had other favorite school subjects (e.g., mathematics, science). Third, children who aspired to careers in the professions (e.g., doctor, lawyer) or computing used the Internet more than did children who aspired to other careers (e.g., sports, entertainment). Fourth, Internet use appears to have no adverse effects on children's social engagement.

These findings have implications for research on understanding the digital "use" divide among children. Given access to the Internet, whether or not a child will use it may depend on her or his beliefs about it. For example, if the Internet is seen as relevant to need satisfaction (e.g., information, communication, self-expression needs) then the child is likely to use. If the

Internet is seen as irrelevant, or if needs can be satisfied more easily using some other media (e.g., telephone), then the child is likely to ignore the Internet. Future research should examine children's beliefs about the Internet and how these construals influence behavior. To the extent that children have erroneous beliefs that adversely affect engagement with the Internet or with digital technology in general, then educational interventions may be needed to correct these beliefs and encourage technology use, particularly for children already on the "wrong" side of the digital divide.

References

- Becker, H.J. (2000). Who's wired and who's not? Children's access to and use of computer technology. *The Future of Children. Children and computer technology*, 10(2), 44-75. Retrieved May 8, 2005, from <http://www.futureofchildren.org>
- Cho, J., Gil de Zuniga, H., Rojas, H., & Shah, D.V. (2003). Beyond access: The digital divide and Internet uses and gratifications. *IT & Society*, 1(4), 46-72. Retrieved May 8, 2005 from <http://www.ITandSociety.org>
- Facer, K., & Furlong, R. (2001). Beyond the myth of the 'cyberkid': Young people at the margins of the information revolution. *Journal of Youth Studies*, 4, 451-469.
- Gorski, P. (2002, Fall). Dismantling the digital divide: A multicultural education framework. *Multicultural Education*, 10, 28-30.
- Jackson, L.A. (2004). Gender and computing. In W.S. Bainbridge (Ed.), *Encyclopedia of human-computer interaction*. Great Barrington, MA: Berkshire Publishing.
- Jackson, L. A., von Eye, A., Biocca, F. A., Barbatsis, G., Zhao, Y., & Fitzgerald, H. E. (in press). Children's home Internet use: Predictors and psychological, social and academic consequences. Invited chapter to appear in R. Kraut, M. Brynin, & S. Kiesler (Eds.), *IT at home: The social impact of domestic computing and telecommunications*. London: Oxford University Press.
- Jackson, L.A., Biocca, F., von Eye, A., Barbatsis, G., Zhao, Y., & Fitzgerald, H.E. (2004, June). Children's Internet use: Findings from the HomeNetToo project. *Proceedings of ED-MEDIA, World Conference on Educational Multimedia, Hypermedia and Telecommunications*, Lugano, Switzerland. Norfolk, VA: Association for the Advancement of Computing in Education.
- Jackson, L.A., von Eye, A., Barbatsis, G., Biocca, F., Fitzgerald, H.E., & Zhao, Y. (2004). The social impact of Internet use on the other side of the digital divide. *Communications of the Association for Computing Machinery*, 47(7), 43-47.
- Jackson, L.A., vonEye, A., Biocca, F., Zhao, Y., Barbatsis, G., & Fitzgerald, H.E. (2004, November). Low-income children's career aspirations and Internet use: Findings from the HomeNetToo project. *Proceedings of the International IPSI 2004 Conference, Symposium on Challenges in Internet and Interdisciplinary Research*, Venice, Italy.
- Jackson, L.A., Barbatsis, G., von Eye, A., Biocca, F.A., Zhao, Y., & Fitzgerald, H.E. (2003). Implications for the digital divide of Internet use in low-income families. *IT & Society*, 1(5), 219-244. Retrieved May 8, 2005 from <http://www.ITandSociety.org>
- Jackson, L.A., Ervin, K.S., Gardner, P.D., & Schmitt, N. (2001). Gender and the Internet: Women communicating and men searching. *Sex Roles*, 44, 363-380.
- Katz, J.E., & Rice, R.E. (2002). *Social consequences of Internet use: Access, involvement, and interaction*. Cambridge, MA: MIT Press.

- Kraut, R., Scherlis, W., Mukopadhyay, T., Manning, J., & Kiesler, S. (1996). The HomeNet field trial of residential Internet services. *Communications of the Association for Computing Machinery, 39*, 55-65.
- Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukopadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist, 53*, 1017-1031.
- Kraut, R., Kiesler, S., Boneva, B., Cummings, J., Helgeson, V., & Crawford, A. (2002). Internet paradox revisited. *Journal of Social Issues, 58*, 49-74.
- Nie, N.J., & Erbring, L. (2000). *Internet and society: A preliminary report*. Stanford Institute for the Quantitative Study of Society, Stanford University, Palo Alto, CA.
- Pew Internet and American Life Project (2000a). *Tracking online life: How women use the Internet to cultivate relationships with family and friends*. Retrieved May 8, 2005, from <http://www.pewinternet.org>
- Pew Internet and American Life Project (2000b). *African Americans and the Internet*. Retrieved May 8, 2005, from <http://www.pewinternet.org>
- Pew Internet and American Life Project (2002). *The digital disconnect: The widening gap between Internet savvy students and their schools*. Retrieved May 8, 2005, from <http://www.pewinternet.org>
- Rocheleau, B. (1995). Computer use by school-age children: Trends, patterns and predictors. *Journal of Educational Computing Research, 1*, 1-17.
- Shields, M.K., & Behrman, R.E. (2000). Children and computer technology: Analysis and recommendations. *The Future of Children, 10*(2), 4-30. Retrieved May 8, 2005, from <http://www.futureofchildren.org>
- Turow, J., & Nir, L. (2000). *The Internet and the family 2000: The view from parents the view from kids*. Philadelphia, PA: Annenberg Public Policy Center.
- UCLA Internet Project. (2000). *Surveying the digital future: Year 1*. UCLA Center for Communication Policy, University of California, Los Angeles. Retrieved May 8, 2005, from <http://www.ccp.ucla.edu/>
- UCLA Internet Project. (2001). *Surveying the digital future: Year 2*. UCLA Center for Communication Policy, University of California, Los Angeles. Retrieved May 8, 2005, from <http://www.ccp.ucla.edu/>
- UCLA Internet Project. (2003). *Surveying the digital future, Year 3*. UCLA Center for Communication Policy, University of California, Los Angeles. Retrieved May 8, 2005, from <http://www.ccp.ucla.edu/>
- U.S. Department of Commerce. 2000. *Falling through the Net: Toward digital inclusion*. National Telecommunications and Information Administration, U.S. Department of Commerce Digital Divide Web site. Retrieved May 8, 2005, from <http://www.ntia.doc.gov/ntiahome/dn/index.html>
- Wengliński, H. (1998). Does it compute? The relationship between educational technology and student achievement in mathematics. Princeton, NJ: Educational Testing Service.
- Woodward, E.H. IV, & Gridina, N. (2000). *Media in the home in 2000: The fifth annual survey of parents and children*. Philadelphia: Annenberg Public Policy Center, University of Pennsylvania.
- Yelland, N., & Lloyd, M. (2001). Virtual kids of the 21st century: Understanding children in schools today. *Information Technology in Childhood Education Annual*, (pp. 175-192).

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