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Digital Divide in Computer Access and Use Between Poor and Non-Poor Youth

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The main objectives of this study were to examine the "digital divide" in home computer ownership and to evaluate differences in academic and non-academic computer use between poor and non-poor youth. Data from a national sample of 1,029, 10- through 14-year-old young adolescents were analyzed. Results show that poor youth were .36 times as likely to own a home computer, but equally as likely to use their home computer for academic purposes as were non-poor youth. Poor youth did not differ from non-poor youth in how often they used any computer for academic purposes, but were less likely to use any computer for non-academic purposes. Government initiatives to close the digital divide and foster computer use among poor youth are suggested.

Key words: digital divide; poverty; computer use; information technology

The phrase "digital divide"—the disparity between individuals who have and do not have access to information technology (IT)—became part of our country's vocabulary in the mid-1990s (Wilhelm, Carmen, & Reynolds, 2002). Well-documented inequalities in access to and use of IT such as the computer and Internet reflect existing patterns of social stratification in the United States (Steyaert, 2002). For example, high-income, Caucasian, married, and well-educated individuals have more access to IT compared to low-income, African American and Latino, unmarried, and less-educated individuals (National Telecommunications and Information Administration [NTIA], 2000, 2002).

Although recent increases in access to IT in public schools have narrowed the IT gap between high- and low-income and
white and minority students (NTIA, 2002), inequalities in IT access and use among children and adolescents continue, paralleling those of adults (Attewell & Battle, 1999). A recent survey (NTIA, 2002) indicates that less than 3% of adolescents living in the highest income families do not use computers, compared to approximately 15% of youth in the lowest income category. Although home computer use is almost universal among the wealthiest youth, only one-third of the lowest-income youth use a home computer. The survey found similar differences in Internet access and use between low- and high-income youth and in computer and Internet access and use between Latinos and African Americans and whites.

For more than a decade, numerous private and government initiatives have assisted poor communities and low-resource schools (where poor and minority students are more likely to reside and to attend) to gain access to computers, educational software, and the Internet (Wilhelm et al., 2002). Despite the well-documented IT gap between high- and low-income youth, and the billions of dollars that have been spent to close this gap (Roberts, 2000), few studies have examined IT access and type of IT use between poor and non-poor youth using multivariate methods. The multivariate methods used in this study enable the assessment of the independent influences of poverty on home computer ownership and on type of IT use, while controlling for other socio-demographic factors.

Implications of the Digital Divide

Diverse groups of individuals from government, education, social work, private foundations, industry, the popular press, as well as parents and youths themselves, have expressed several reasons why the nation should be concerned about the gap between the IT "haves" and "have-nots" (Brown, 2000; Hick & McNutt, 2002; NTIA, 2000; Turow & Nir, 2000). These concerns fall into four main themes: educational advantages, future employment and earnings, opportunities for social and civic involvement, and equity and civil rights issues.

Many educators, researchers, policy advocates, and government officials maintain that computers, educational software, and
the Internet offer a number of educational advantages (Center for Media Education, 1996; Lepper & Gurtner, 1989; Ross, Smith, & Morrison, 1991). IT can provide students and teachers with a large body of easily accessible information; create opportunities to reinforce learning basic, new, and higher-order cognitive skills; and increase student interest and motivation, parent-school communication, and parent involvement. These advantages, in turn, are expected to produce positive educational outcomes such as increased student achievement and school retention (Center for Media Education, 1996; U. S. Department of Education, 1999; Wenglinsky, 1998). Research tends to support these expectations, generally finding positive relations between school, home, and community uses of IT and a variety of academic outcomes both for socioeconomically disadvantaged (e.g., Blanton, Moorman, Hayes, & Warner, 1997; Ross et al., 1991; Sutton, 1991) and other children and youth (e.g., Campbell, Hombo, & Mazzeo, 2000; Fletcher-Flinn & Gravatt, 1995; Rocheleau, 1995; Schacter, 1999; Wenglinsky, 1998). Recent polls also indicate that parents, registered voters, elected officials, and business leaders share the belief that IT provides students with educational advantages. For example, almost 90% of polled parents agreed that access to IT assists children with their school work, and 74% of parents believed that children without access to IT are at an educational disadvantage (Turow & Nir, 2000). Over two-thirds of registered voters also agreed that educational computer uses would make a great deal or a fair amount of difference in the quality of children’s education (Milken Exchange on Educational Technology, 1998).

Children’s and adolescent’s access to and use of IT also are expected to increase future employment and earning opportunities. IT skills assist youth in researching and locating employment (NTIA, 2000). IT skills prepare youth to successfully compete in job markets in which an increasing number of occupations require such skills (U.S. Department of Education, 1999), and employers compensate workers who possess them with higher wages (Krueger, 1993). The belief among adolescents themselves that IT is important to their current and future well-being is reflected in a recent poll (Gallup Organization, 1997). Over three-fourths of the teenagers thought that owning a computer was critically
important, and more than 80% of these youths believed strong computer skills and IT knowledge were necessary for them to make a good living in the future.

IT not only has revolutionized the way individuals learn and earn a living, but has provided new avenues for communicating and participating in the nation’s social and civic life (Lonergan, 2000; NTIA, 2000). Daily newspapers, research, and government and private information on a variety of important social and civic topics are available online (Brown, 2000). In addition, computer and Internet technologies provide a variety of communication methods such as electronic-mail, instant messages, listserves, and chatrooms, placing youth who lack access to or skills in using IT at a social disadvantage (NTIA, 2000).

The widespread belief in the benefits of IT to the educational, occupational, and social well-being of individuals, and the IT gap between the poor and non-poor and minorities and whites, have led some to characterize the “digital divide” as one of America’s leading equity or civil rights issues (Brown, 2000; Lonergan, 2000; NTIA, 1999). Inequalities in IT access and use not only mirror existing patterns of social stratification, but can maintain and even widen current disparities between these groups in important indicators of well-being such as academic achievement and earnings (Johnson, 2000; Krueger, 1993; Sutton, 1991; U. S. Department of Education, 2002). Disparities in academic achievement might widen because low-income and minority youth are unable to take full advantage of the educational benefits of IT. Inequalities in earnings might increase as a result of poor and minority youth being less prepared to compete for higher paying jobs that require IT skills, or result from the link between academic achievement and subsequent educational attainment and future earnings (Jencks & Phillips, 1999).

Critiques of IT

Not all educators and researchers are enthusiastic about the recent trend in the widespread use of IT among children and youth. Those who criticize this trend argue that research has not convincingly demonstrated that IT is effective in enhancing academic outcomes (Oppenheimer, 1997). Moreover, youth frequently use IT for recreational purposes such as playing video-
games, which might increase social withdrawal among socially marginal youth, encourage impulsive and aggressive behaviors (Lin & Lepper, 1987), or displace traditional instruction in the school and academic activities in the home (such reading and completing homework) that enhance academic achievement (Colaric & Jonassen, 2001; Johnson, 2000; Lepper & Gurtner, 1989).

Arguments against the widespread use of IT among children and adolescents might be especially applicable to poor youth. Although most children and adolescents use the computer primarily for recreational purposes such as playing games, E-mail, and listening to music, rather than for academic learning (Becker, 2000; Giacquinta & Lane, 1990; Kafai & Sutton, 1999), a Gallup Poll (1997) found that a higher percentage of low-income youth used the computer to play video games daily, compared to their wealthier peers. Other research suggests that socioeconomically disadvantaged youth would be less likely to use IT for academically productive purposes because their parents are less able to provide educational software, computer hardware, technical assistance, and supervision, compared to wealthier parents (Attewell & Battle, 1999; Becker, 2000; Giacquinta & Lane, 1990). A similar argument has been applied to low-resource schools, to which poor and minority youth are more likely to attend. Low teacher-student ratios, outdated technology, and teachers with few IT skills, factors that are associated with low-resource schools, would likely result in low levels of supervision and unproductive educational uses of IT (Becker, 2000; Ryan, 1991; Wenglinsky, 1998).

Despite the existing disparities in IT access and use between poor and non-poor youth and the allocation of billions of federal dollars to increase IT access and use (Lonergan, 2000; Roberts, 2000), few studies have used a multivariate approach to examine the independent impact of poverty on home computer ownership and type of IT use. Such results could provide the basis for policy development focused on addressing specific and clearly identified effects of the digital divide. Recent data from a national sample of young adolescents are used to examine four specific research questions: Controlling for the youth’s race/ethnicity, age, gender, and the marital status and education of the youth’s mother (1) are poor youth less likely to have access to a home
computer, (2) are poor youth less likely to use their home computer for academic purposes, (3) do poor youth use any computer less often for academic purposes, and (4) do poor youth use any computer more often for non-academic purposes, compared to non-poor youth?

Method

Data and Sample

Data were drawn from the National Longitudinal Survey of Youth (NLSY) and the NLSY mother/child data sets. The original NLSY, initiated in 1979, included 12,686 individuals between 14 and 21 years of age, including oversamples of African American, Latino, and economically disadvantaged youth. Respondents were interviewed annually from 1979 through 1994, and biannually thereafter. Beginning in 1986 and every two years afterwards, a number of assessments were administered to the original NLSY female participants and to their biological children. By 2000, the most recent data available for this analysis, 8,323 children had been born to the 4,113 interviewed female respondents (Center for Human Resource Research, 2001).

Young adolescent children of the original NLSY female cohort who were interviewed in 2000 comprise the sample used in this analysis. These adolescents were 10 through 14 years of age, were attending public school, and answered at least one survey question related to computers and their use. The sample was limited to youth between the ages of 10 through 14 years because only children in this age range were evaluated with the self-administered survey that provided the computer variables for this analysis. To meet the assumption of statistical independence, only one young adolescent was selected randomly from families with more than one child. The remaining sample of 1,029 young adolescents included 288 Black, 166 Hispanic, and 575 non-Hispanic, White youth (hereinafter referred to as “African American,” “Latino,” and “white”).

Measures

Independent variables. Poverty was measured by comparing family income reported by the female respondent during the 2000
interview (which refers to income in 1999) to 185% of the official poverty threshold for the family size measured at the interview date. If total family income for a given family size fell below 185% of the official threshold, the youth was categorized as poor, and as non-poor otherwise. Defining poverty as 185% of the poverty thresholds is consistent with federal government eligibility guidelines for a free or reduced-price lunch and with other studies examining the relation between low income and computer access and use (e.g., Cattagni & Westat, 2001; Wenglinsky, 1998).

Other independent variables included the youth’s age (10, 11, 12, 13, and 14); gender; race/ethnicity, based on the mother’s racial/ethnic identification (African American; Latino; and white); mothers’ marital status (married, spouse present; all other types) and mothers’ years of education (less than 12 years; 12 years; more than 12 years). The youth’s age and the mother’s marital status and educational attainment were measured at the 2000 interview date. Variables indicating location of residence (urban vs. rural and region of the country) initially were evaluated in the models presented in the Results section. Because none of the residence coefficients were statistically significant nor substantively affected the size or significance of other coefficients, the variables were removed from the final models. Respondents provided complete information on all the independent variables, with the exception of family income (approximately 15% of respondents had missing income information). For respondents with missing income data, poverty status was imputed using the matching procedures available in Interactive LISREL (du Toit & du Toit, 2001).

**Dependent variables.** The first dependent variable measured whether the youth had a *home computer*. Those youth who had a home computer indicated which of seven activities they used their computer for most often. Based on findings from a principal components analysis of similar items (explained in the next paragraph) an *academic home computer use* dichotomous variable was formed by grouping two items indicating academic use (school or homework; learn/practice a skill such as art, music or another language) and five items indicating non-academic use (entertainment, such as games and recreation; writing letters and
correspondence; references or looking things up; accessing the Internet or using E-mail; other uses). The other two dependent variables were the frequency of youth’s academic and non-academic use of any computer. These variables were measured by the youth rating (0 = never to 4 = almost every day) how often they used any computer for 13 specific purposes. In order to determine whether these items could be reduced to conceptually coherent sets of variables, indicating academic and non-academic computer use, a principal components analysis was conducted (Dunteman, 1989). The analysis yielded two components. The first component indicated academic computer use (writing stories, reports, compositions, or papers; doing math, graphs, or computation; doing reading or spelling; doing science problems; learning, practicing, or making music; doing art work or graphics; creating or writing computer programs; and analyzing data). For the academic use component, Cronbach’s alpha = .84; lowest factor loading = .50. The second component indicated non-academic computer use (writing letters; looking up things or using references; playing games; reading or sending E-mail; and accessing the Internet or other on-line networks or services). Alpha = .75; lowest factor loading = .52. Additive scales were created to measure the frequency of academic and non-academic computer use (scores ranged from 0 to 20 for academic use, and from 0 to 18 for non-academic use).

Data Analysis

Data analysis was conducted in two steps. First, weighted descriptive statistics for the study sample and dependent variables were computed. Second, multivariate models for the dichotomous variables (home computer ownership and home computer academic use) were estimated using logistic regression, the preferred analysis of binary dependent variables (Allison, 1999). Multivariate logistic regression allows for examining the effect that each independent variable contributes to the log odds that the respondent had a home computer (versus no home computer) and used the home computer most often for academic purposes (versus non-academic purposes), while adjusting for the effects of the other independent variables. Multivariate (Ordinary Least Squares) regression models were estimated for the frequency of academic and non-academic computer use. As recommended
by the Center for Human Resource Research (2001), the regression analyses were conducted using unweighted data. The race/ethnicity variables controlled for the oversamples of minority respondents included in the NLSY.

Results

Weighted means and standard deviations or percentages for the study sample and variables are presented in Table 1. Although more than 87% of non-poor youth had a home computer, only 55.89% of poor youth had a computer. Among the 710 youths who had access to a home computer and answered the item related to computer use, only 26 (3.32%) reported that they did not use their home computer. There were no significant differences in using versus not using their home computer between poor and non-poor youth, $\chi^2(1, N = 710) = .075, p = .784$. Table 1 also indicates large differences in computer ownership between white (84.13%) and African American (51.76%) and Latino (59.16%) youth. A relatively low percentage of youth (19.63%) reported using their home computer most for academic purposes, a percentage that is similar for poor (22.33%) and non-poor (23.16%) youth. A larger percentage of African Americans (33.02%) and Latinos (30.67%), however, reported using their home computer for academic use, compared to whites (21.51%). Youth also reported using any computer more frequently for non-academic ($M = 8.88$) versus academic uses ($M = 5.86$). Means for frequency of academic computer use are almost identical for poor and non-poor youth, but poor youth reported using any computer less often for non-academic purposes ($M = 7.83$) than did non-poor youth ($M = 9.30$). As compared to whites, African Americans and Latinos reported using any computer more often for academic purposes and less often for non-academic purposes.

Results of the multivariate logit analysis of poverty and other factors associated with home computer ownership and youth academic use of their home computer appear in Table 2. Controlling for the effects of all other variables in the model, the odds ratio for poverty indicates that poor young adolescents were .36 times as likely to have a home computer as non-poor youth. African American (odds ratio = .28) and Latino (odds ratio = .37)
Table 1
Weighted Means (Standard Deviations) or Percentages for the Study Sample and Variables (N = 1,029)\textsuperscript{a}

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study Sample</th>
<th>Home Computer Ownership</th>
<th>Academic Home Computer Use</th>
<th>Frequency Academic Computer Use</th>
<th>Frequency Non-Academic Computer Use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty (less than 185% of official threshold)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>29.57%</td>
<td>55.89%</td>
<td>22.33%</td>
<td>5.90</td>
<td>7.83</td>
</tr>
<tr>
<td>Non-poor</td>
<td>70.43%</td>
<td>87.18%</td>
<td>23.16%</td>
<td>5.85</td>
<td>9.30</td>
</tr>
<tr>
<td><strong>Youth/Mother Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Youth age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ten</td>
<td>21.15%</td>
<td>76.32%</td>
<td>18.81%</td>
<td>5.58</td>
<td>7.58</td>
</tr>
<tr>
<td>Eleven</td>
<td>20.51%</td>
<td>80.84%</td>
<td>22.28%</td>
<td>5.66</td>
<td>8.29</td>
</tr>
<tr>
<td>Twelve</td>
<td>22.71%</td>
<td>77.05%</td>
<td>23.28%</td>
<td>5.96</td>
<td>8.86</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Note: Standard deviations are in parentheses.
| Thirteen | 22.75 | 77.95 | 24.19 | 5.76 | 9.96 |
| Fourteen | 12.88 | 77.36 | 28.15 | 6.60 | 9.93 |

Youth gender
- Female 47.36% 76.30% 23.07% 5.97  8.79
- Male 52.64% 79.37% 22.90% 5.76  8.96

Youth race/ethnicity
- African American 14.21% 51.76% 33.02% 7.75  7.69
- Latino 6.66% 59.16% 30.67% 6.45  7.50
- White 79.13% 84.13% 21.51% 5.50  9.19

Mothers’ marital status
- Married, spouse present 69.43% 84.73% 21.82% 5.77  9.25
- All other types 30.57% 62.46% 26.79% 6.08  7.98

(continued)
Table 1
(Continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study Sample</th>
<th>Home Computer Ownership</th>
<th>Academic Home Computer Use</th>
<th>Frequency Academic Computer Use</th>
<th>Frequency Non-Academic Computer Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers' years of education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 12 years</td>
<td>13.42%</td>
<td>54.19%</td>
<td>30.70%</td>
<td>6.65</td>
<td>7.96</td>
</tr>
<tr>
<td>12 years</td>
<td>39.21%</td>
<td>70.37%</td>
<td>23.49%</td>
<td>6.00</td>
<td>8.62</td>
</tr>
<tr>
<td>More than 12 years</td>
<td>47.37%</td>
<td>90.89%</td>
<td>21.43%</td>
<td>5.54</td>
<td>9.33</td>
</tr>
</tbody>
</table>

**Dependent Variables**

Home computer ownership (n = 1,002)
- Yes: 77.92%
- No: 22.08%

Academic home computer use (n = 690)
- Yes: 19.63%
- No: 80.37%
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency academic computer use (n = 894)</td>
<td>5.86</td>
<td>(4.99)</td>
</tr>
<tr>
<td>Frequency non-academic computer use (n = 894)</td>
<td>8.88</td>
<td>(4.86)</td>
</tr>
</tbody>
</table>

*Notes: Weights adjust for oversamples of African American and Latino youth. Sample size is unweighted and varies depending on the number of responses on the dependent variable.*
Table 2
Multivariate Logit Analyses of the Effect of Poverty and Other Factors on Home Computer Ownership (N = 1,022) and Academic Home Computer Use (N = 690) Among Young Adolescents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Home Computer Ownership</th>
<th></th>
<th>Academic Home Computer Use</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Logit Coefficient</td>
<td>Odds Ratio</td>
<td>Logit Coefficient</td>
<td>Odds Ratio</td>
</tr>
<tr>
<td>Poor (non-poor)</td>
<td>-1.03***</td>
<td>.36</td>
<td>-.13</td>
<td>.88</td>
</tr>
<tr>
<td>Youth age (14 years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ten</td>
<td>-.34</td>
<td>.71</td>
<td>-.42</td>
<td>.66</td>
</tr>
<tr>
<td>Eleven</td>
<td>.03</td>
<td>1.03</td>
<td>-.22</td>
<td>.80</td>
</tr>
<tr>
<td>Twelve</td>
<td>-.20</td>
<td>.82</td>
<td>-.25</td>
<td>.78</td>
</tr>
<tr>
<td>Thirteen</td>
<td>-.22</td>
<td>.81</td>
<td>-.20</td>
<td>.82</td>
</tr>
<tr>
<td>Youth male</td>
<td>.15</td>
<td>1.16</td>
<td>-.20</td>
<td>.82</td>
</tr>
<tr>
<td>Youth race/ethnicity (white)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>-1.27***</td>
<td>.28</td>
<td>.58*</td>
<td>1.78</td>
</tr>
<tr>
<td>Latino</td>
<td>-1.00***</td>
<td>.37</td>
<td>.63*</td>
<td>1.88</td>
</tr>
<tr>
<td>Mother married, spouse present</td>
<td>.34†</td>
<td>1.41</td>
<td>-.09</td>
<td>.91</td>
</tr>
<tr>
<td>Mothers’ years of education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(more than 12 years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 years</td>
<td>-1.20***</td>
<td>.30</td>
<td>.08</td>
<td>1.09</td>
</tr>
<tr>
<td>Less than 12 years</td>
<td>-1.48***</td>
<td>.23</td>
<td>.06</td>
<td>1.06</td>
</tr>
</tbody>
</table>

Notes: Reference categories are in parenthesis.
†p < .10; *p < .05; **p < .01; ***p < .001

Youth also were less likely to have a home computer compared with white youth. Results of the second multivariate logit model indicate that poor youth were about equally as likely to report using their home computer most often for academic purposes as were non-poor youth. African Americans (odds ratio = 1.78) and Latinos (odds ratio = 1.88) also were more likely to report using their home computer most often for academic purposes compared to whites.
Table 3

Multivariate Regression Analyses of the Effect of Poverty and Other Factors on Frequency of Young Adolescent Academic and Non-Academic Computer Use (N = 894)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency Academic Computer Use b</th>
<th>Frequency Non-academic Computer Use b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor (non-poor)</td>
<td>-.12</td>
<td>-.96*</td>
</tr>
<tr>
<td>Youth age (14 years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ten</td>
<td>-.91</td>
<td>-2.26***</td>
</tr>
<tr>
<td>Eleven</td>
<td>-.92</td>
<td>-1.85***</td>
</tr>
<tr>
<td>Twelve</td>
<td>-.42</td>
<td>-.83</td>
</tr>
<tr>
<td>Thirteen</td>
<td>-.79</td>
<td>-.04</td>
</tr>
<tr>
<td>Youth male</td>
<td>.05</td>
<td>.24</td>
</tr>
<tr>
<td>Youth race/ethnicity (white)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>2.24***</td>
<td>-1.15**</td>
</tr>
<tr>
<td>Latino</td>
<td>.85†</td>
<td>-1.23**</td>
</tr>
<tr>
<td>Mother married, spouse present (other types of marital status)</td>
<td>.41</td>
<td>.27</td>
</tr>
<tr>
<td>Mothers’ years of education (more than 12 years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 years</td>
<td>.67</td>
<td>-.62†</td>
</tr>
<tr>
<td>Less than 12 years</td>
<td>1.11*</td>
<td>-.77</td>
</tr>
</tbody>
</table>

Notes: Reference categories are in parenthesis.  
†p < .10 ; p < .05; **p < .01; ***p < .001

Table 3 presents the results of the multivariate (OLS) regression analyses of poverty and other factors associated with the time young adolescents spent on academic and non-academic uses of any computer. Poor youth did not significantly differ in the frequency of their computer use for academic purposes compared with non-poor youth, but poor youth reported using a computer significantly less often for non-academic purposes (b = -.96, p < .05). African Americans (b = 2.24, p < .001) and Latinos (b = .85, p < .10) reported using a computer more frequently
than whites for academic purposes and less frequently for non-academic purposes \((b = -1.15, p < .01, \text{ for African Americans}; b = -1.23, p < .01, \text{ for Latinos})\).

Absence of a statistically significant difference in frequency of academic computer use between poor and non-poor youth, as well as the negative relation between poverty and frequency of non-academic use, might result from poor youth's more restricted access to computers. Since poor youth are less likely to have access to a home computer, they must use computers in schools or in other community locations where their computer use probably would be more restricted and monitored. If poor youth did have comparable access to a home computer as do non-poor youth, they might use computers for academic purposes less frequently and perhaps use computers for non-academic purposes more frequently than non-poor youth. In order to test this possibility, two additional variables were entered into the regression models. The first measured whether the youth had and used a home computer (versus did not have or did not use an available home computer). In both models, coefficients for this variable were positive and significant, indicating that youth who had and used a home computer used a computer more frequently for both academic \((b = 1.02, p < .05)\) and non-academic \((b = 2.98, p < .001)\) uses, compared to youth who did not have or did not use an available home computer. In addition, the coefficient for the poverty variable in the non-academic computer use model was no longer significant, suggesting that differences in the frequency of non-academic use between poor and non-poor youth were due to differences in the use of a home computer. When the home use variable was entered into the regression model, African Americans \((b = 2.58, p < .001)\) and Latinos \((b = 1.12, p < .05)\) were still more likely to report using any computer for academic purposes, compared to whites. The race/ethnicity coefficients were not statistically significant in the non-academic use model.

The second variable, an interaction between poverty status and the previously defined home computer variable, tested whether poor youth who used a home computer used any computer more frequently for academic or non-academic purposes than did non-poor youth. The interaction term was not statistically significant in either model, indicating that poor youth who
use a home computer do not differ from non-poor youth in the time they spend on academic or non-academic computer uses.

Conclusions and Discussion

The objectives of this study were to examine disparities in home computer ownership and in academic and non-academic uses of computers between poor and non-poor youth, using data from a national sample of young adolescents between the ages of 10 through 14 years. Study findings indicate that poor youth were .36 times as likely to have a home computer compared to non-poor youth. Indeed, there is a “digital divide” between poor and non-poor young adolescents in home computer access that is independent of any effects of the youth’s age, gender, race/ethnicity, and the marital status and education of the youth’s mother. However, when a home computer was present, poor youth were just as likely to use the home computer for academic purposes as were non-poor youth. A failure to find a significant interaction between poverty and use of an available home computer and type of computer use adds to the validity of this finding.

Whether home computer use or type of IT use translates into better academic outcomes for children and adolescents, however, has not been adequately studied (Lauman, 2000) and is an area for future research. On the other hand, research has produced little evidence that home computer use results in socioemotional problems for youth or displaces more academically beneficial activities such as reading or completing homework (for a review of this literature, see Subrahmanyam, Greenfield, Kraut, & Gross, 2001). This research, in conjunction with the findings of the current study, suggests that increasing poor youth’s access to home computers will not cause harm, but might allow these youth to accrue a variety of social, employment, and possible academic benefits (NTIA, 2000; Lonergan, 2000).

The findings of the current study indicating that poor youth do not use any computer for academic purposes less often than do non-poor youth, regardless of whether they have a home computer, are consistent with the finding for the use of a home computer. These results suggest that increasing poor youth’s access to computers in the community most likely will result in poor
youth using IT for academic purposes as often as their wealthier peers. Although poverty was associated with using any computer less frequently for non-academic use, this relation appears to be the result of poor youth being less likely to own home computers. If increasing access to home computers resulted in poor youth using the computer more often for non-academic purposes than they currently do, some research suggests that even non-academic uses of computers might have educational benefits. For example, recreational games can encourage and develop the use of complex cognitive processes, which might transfer to academic situations that require problem-solving abilities (Pillay, Brownlee, & Wilss, 1999).

Although not the main focus of this study, the racial/ethnic differences found in IT access and use are noteworthy. Differences in home computer access between whites and African Americans and Latinos have been established by past studies (NTIA, 2002; Wenglinsky, 1998), and these differences remain in this study even after controlling for poverty and other demographic factors (e.g., mother’s marital status and educational level). These racial/ethnic disparities in computer ownership might be explained by variations in the depth of poverty or in attitudes toward the benefits of computer ownership between whites and African Americans and Latinos. Future research is needed to explore these results and also to explore the findings that African American and Latino youth use IT for academic purposes more than whites. Perhaps African American and Latino parents are more likely to monitor and restrict their young adolescents’ home computer use. The current findings indicate that if increasing IT access and use result in better academic outcomes and job opportunities, these benefits would be particularly important for African Americans and Latinos.

This study has a number of limitations. Among the most important is the reliance on young adolescents’ self-reports of computer access and use, which might not be reliable. The restricted age range of the youth limits the generalizability of the study findings. If additional information on IT access and use were available in the NLSY (e.g., presence of an Internet connection or educational software in the home), this information could have
contribute to better understanding differences in IT access and use between poor and non-poor youth.

Despite these limitations, two main policy implications can be drawn from the findings of this study. First, the federal government should continue efforts to achieve its stated “vital national goal” of increasing the number of Americans who use IT (NTIA, 2002) by continuing programs (e.g., the Education- rate and Community Technology Centers Program) to assist low-resource communities and schools in increasing access, use, and quality of IT applications (Roberts, 2000). Largely due to such efforts, progress has been made in decreasing, and even eliminating, disparities between poor and non-poor and minority and white youth in IT access and use in public schools (U. S. Department of Education, 2002; NTIA, 2002). Current programs should be continued and expanded to include assisting low-income families to purchase home computers (e.g., through a tax credit), and increasing research funds to understand and ameliorate factors that block access to home computer ownership among ethnic minority youth. Unfortunately, the current administration’s budget proposal for 2003 (Executive Office of the President of the United States, 2002) calls for eliminating such programs. One of the most important of these is the Community Technology Centers Program, which provides grants to economically distressed areas to assist residents in gaining access to IT in community locations such as libraries and public housing facilities (Roberts, 2000).

Second, if government officials and the general public consider access to IT important to the education, future job opportunities, and social and civic participation of our nation’s youth, this study indicates that establishing eligibility guidelines for obtaining relevant government assistance at even 185% of official poverty thresholds might be too low. Since poverty thresholds were established in 1965, debates have continued regarding adequate measures of economic hardship. Many researchers contend that at least one poverty measure should reflect the economic resources necessary to participate in the “activities of normal living” (Glennerster, 2002). Not only should federal policies continue to assist IT “have-nots” in obtaining access to computer
technologies, but must ensure realistic eligibility guidelines for obtaining such assistance.

References


