



Self-concept, self-esteem, gender, race and information technology use

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ABSTRACT

This research addressed two fundamental questions regarding self-concept, self-esteem, gender, race and information technology use. First, is technology use related to dimensions of self-concept and/or to self-esteem? Second, are there gender and/or race differences in self-concept, self-esteem and technology use? Approximately 500 youth, average age 12 years old, one-third of whom were African American and the remaining two-thirds were Caucasian American, completed multidimensional measures of self-concept, the Rosenberg (1965) self-esteem scale and measures of frequency of Internet use, Internet use for communication (email and instant messaging), videogame playing and cell phone use. Findings indicated that technology use predicted dimensions of self-concept and self-esteem, with videogame playing having a negative influence, and Internet use having a positive influence on self-concept dimensions. Gender differences were observed on several self-concept dimensions but contrary to expectations not on the social self-concept dimension. Only one race difference was observed and this was in behavioral self-concept. Implications of the benefits and liabilities of youth's current and future technology use are discussed.

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1. Introduction

The purpose of this research was to examine relationships among self-concept, self-esteem and information technology (IT) use and to explore possible gender and race differences in these relationships. Harter's Self-Perceived Competence scale (1984, 1999) and additional measures of self-concept developed in previous research were used to capture the multidimensional nature of self-concept (Crocker, Eklund, & Kowalski, 2000; Marsh, 1998). Rosenberg's self-esteem scale, a widely accepted and well-validated measure of one's overall sense of self-worth was used to measure self-esteem (Rosenberg, 1985). Multiple measures of IT use typical of pre-teen children were used to examine relationships between IT use and dimensions of self-concept and self-esteem.

According to Harter (1999), youth's self-concepts can be captured by three dimensions: cognitive, social and physical appearance/body self-concept. Cognitive self-concept is based primarily on school or academic performance. Social self-concept is based on popularity with peers and friendship networks. Physical appearance/body self-concept is based on self-perceived athletic skills and participation in sports. Harter also posited a fourth general dimension that summarizes general feelings of self-worth or what is typically referred to as self-esteem. The cognitive, social and physical appearance self-concept dimensions are considered

distinct from the self-worth or self-esteem dimension, although evaluations along the former dimensions contribute to overall self-esteem. Fox (1999) defined self-esteem as an evaluation of the self-concept, including feelings associated with that evaluation. Dimensions of self-concept contribute to global self-esteem to the extent that these dimensions are considered important to one's sense of self (Fox, 2000).

1.1. Information technology use, self-concept and self-esteem

Information technology (IT) use is defined in this research as the frequency of Internet use, Internet use for communication, videogame playing and cell phone use. A diverse set of research findings suggests that there may be relationships between IT use and dimensions of self-concept and self-esteem, although the direction and nature of these relationships have yet to be demonstrated.

First, with respect to cognitive self-concept, research indicates that the presence of computers in the home is a strong predictor of academic success in mathematics and science and overall academic success (BECTA, 2003; National Center for Educational Statistics, 2000), suggesting a positive relationship between Internet use and cognitive self-concept. However, a variety of factors related to having computers in the home and to academic success, such as parental income and education, may account for this relationship. A review of research on school learning with computer-based technology, which included five meta-analytic reviews, came to the unsatisfying conclusion that the findings are inconclusive (Roschelle, Pea, Hoadley, Gordon, & Means, 2000). Sometimes

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computer-based technology facilitated academic performance but other times no relationship is found.

A recent longitudinal study of low-income youth and home Internet use suggests a positive *causal* relationship between Internet use and academic performance (Jackson et al., 2006). Children who used the Internet more over a 16-month observational period scored higher on standardized tests of reading skills and had higher GPAs than did children who used it less. However, a large-scale national evaluation project in the UK suggests no relationship between computer and Internet availability in school and performance on standardized tests of achievement (BECTA, 2003). Large-scale national surveys in the U.S. indicate that youth *perceive* a positive relationship between Internet availability at home and their academic performance but parents report no effects of home Internet access on their youth's performance in school (Annenberg Digital Future Project, 2006; Pew Internet & American Life Project, 2005a).

Research on the effects of videogame playing suggests conflicting relationships with cognitive self-concept. On the one hand is evidence that videogame playing increases visual-spatial skills – skills considered by many to be the “training wheels” for performance in mathematics, science and technology (Subrahmanyam, Greenfield, Kraut, & Gross, 2001). In several studies, including experimental studies, playing videogames was positively and causally related to visual-spatial skills (Green & Bavelier, 2007), although most of these studies were with adult users. On the other hand there is a substantial body of mostly correlational research indicating that children who play videogame more have lower grand point averages (GPAs) and more problematic school behavior, as reported by teachers, than children who play videogames less, regardless of platform (e.g., console or Internet; Anderson, Gentile, & Buckley, 2007; Walsh, Gentile, Walsh, & Bennett, 2006). Thus, the effects of IT use, be it computer, Internet or videogame use, on academic self-concept are unclear.

Second, with respect to social self-concept and IT use, research has again produced conflicting findings. On the one hand is evidence that Internet use, particularly e-mailing and instant messaging, strengthens connections with family and friends (e.g., Annenberg Digital Future Project, 2006; Jackson, Ervin, Gardner, & Schmitt, 2001; McKenna, Green, & Gleason, 2002). Pew Internet and American Life Project (2006, 2007; Weiser, 2001). These strengthened connections hold true for friends and family seen in everyday life and for distant friends and family. However, there is also evidence suggesting that the social benefits of Internet use may depend on characteristics of the user and the nature of Internet use. Adolescents who are already social engaged in the real world may benefit from Internet use because it facilitates and extends real social ties. Adolescents with weak social connections in the real world risk becoming further isolated by concentrating their social activities in the online world (Jackson, 2008), typically in chat rooms but more recently is social networking websites (e.g., FaceBook and MySpace).

Similarly, videogame playing may have either positive or negative effects on social self-concept. Positive effects occur when videogame playing involves groups already connected by real-life social ties, ties that are strengthened by a shared interest and engagement in videogame playing. However, playing *violent* videogames has been unequivocally linked to increased aggressive cognition and behavior, both immediately and years after playing. Such negative social behavior is likely to undermine social self-concept.

Findings regarding the relationship between psychological self-concept (i.e., general well-being or self-esteem) and IT use are also inconclusive. On the positive side there is evidence from a sample of over 1000 Dutch adolescents that online communication may encourage self-disclosure, contributing to friendship networks,

self-esteem and well-being (Valkenburg, Peter, & Schouten, 2006). On the negative side there is evidence that youth at risk for depression, and youth who overuse specific Internet tools, such as chat rooms, may be psychologically harmed by Internet use (e.g., Youth Internet Safety Survey, 2001). There are also concerns about potential psychological harm attributable to exposure to Internet pornography, cyberbullying, hate speech and sexual predators (Jackson, 2008).

IT use may also be related to physical appearance self-concept. Time online and time spent playing videogames is time taken away from physical activity and decreased physical activity is strongly associated with increased body weight (American Obesity Association, 2005). Indeed there is widespread concern that increased screen time, whether it be watching TV, playing videogames or surfing the Internet, is responsible, at least in part, for the alarming increase in overweight and obesity among America's youth (e.g., Kaiser Family Foundation, 2005; Moore, 2007).

Although the cell phone is one of the most widely used technologies in the world (Intel Reports, 2005), research is just beginning to examine the effects of cell phone use on psychological well-being (i.e., self-esteem). Voice calls are currently the primary use of cell phones, accounting for about 80% of cell phone revenue, but text messaging is becoming increasingly popular, especially among adolescents and young adults. One study found that cell phone cyberbullying is on the rise and may result in harmful psychological consequences for its victims. Research on adult cell phone use suggests negative effects on family relationships attributable to blurring the distinction between family and work (Chesley, 2005). Other studies find that cell phone use by adults has also been linked to facilitating romantic relationships (Bannerman, 2006). What, if any effects cell phone use has on early adolescents is unknown.

1.2. Gender, race and information technology (IT) use

Although worldwide there is a gender gap in access to IT favoring males (Norris, 2001; van Dijk, 2005), the gender gap in the U.S., once substantial, has all but disappeared (Pew Internet & American Life Project, 2000a, 2006). However, gender differences abide in the intensity and nature of Internet use and knowledge about the Internet (Pew Internet & American Life Project, 2000a, 2005a, 2006). Males use the Internet more intensely than do females, going online more often and for longer periods of time. Males are more likely to use the Internet for commercial transactions whereas females are more likely to use it to connect with family and friends. Males are more knowledgeable about the Internet than are females.

The existence of a racial digital divide is a much debated and largely unresolved issue. While racial disparities in access to the Internet have decreased dramatically, disparities in the intensity and nature of Internet use remain (e.g., Drori, 2005; Pew Internet & American Life Project, 2000b, 2005a, 2005b; 2006; Van Dijk, 2005). Home Internet access in the U.S. remains lower for African American adolescents than for Caucasian American adolescents and these differences cannot be attributed to income alone. Even within income levels there are race differences home Internet access favoring Caucasian Americans to African Americans (Hoffman, Novak, & Schlosser, 2001; Jackson, 2008). Moreover, a new digital divide is developing between those who have broadband access to the Internet and those who have dial-up access. Again this divide cannot be explained entirely on race differences in income. Some researchers and policy makers have argued that the broadband divide may have implications as far-reaching as the original access divide because broadband changes dramatically the users' relationship with the Internet. (Drori, 2005; Livingstone, 2003). Users who access the Internet by broadband spend more

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