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The Digital Divide: A Study of the Intra-Ethnic Divide within the African American
Population in Johnson City Tennessee

A thesis

presented to

The faculty of the Department of Technology
East Tennessee State University

In partial fulfillment

Of the requirements for the degree

Masters in Digital Media

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Dr. Keith Johnson, Chair

Dr. Barbara Beauchamp

Mr. Primus Tillman

Keywords: Digital Divide, African American, Computers, Internet

ABSTRACT

The Digital Divide: A Study of the Intra-Ethnic Divide within the African American
Population in Johnson City Tennessee

By

Sonja Schreckenber

This study examined how much access African American adults 25 years and older, living in Johnson City, Tennessee had to computers, and the factors that most influenced such access. Data was collected from 271 persons living in the area. Statistical analysis was done using SPSS software to determine how certain demographics would contribute to the level of computer access.

Results from the study revealed that a digital divide existed within the African American community, with income being a strong determinant of access to computers. The highest level of access for the sample was in the salary range of \$50,000-74,999. Computer access at home was 95.2% and 97.3% at work. Computer access at home showed a decline as participants' ages increased. Email usage was the number one activity reported, at close to 75%, followed by research at 60.5%. Gender did not influence computer access in this study.

DEDICATION

To my husband Kai

Thank you for always being the wind beneath my wings.

ACKNOWLEDGEMENTS

I would like to express sincere thanks to:

Almighty God for giving me the strength to complete this journey;

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CHAPTER 1

INTRODUCTION

Statement of Problem

In today's fast paced world, we are relying heavily on the use of computers to help slow down the pace. Computer literacy and interactivity begins at a very early age. Through observation, it seems as though by the time most children have entered the first grade, they have already been introduced to a computer. Much of our banking, shopping, and entertainment are done on the computer. Society, as a whole, has slowly moved towards leaving the traditional "paper trail" behind and has adopted the new trend of computer technology instead. The way in which we communicate has changed and so has our lifestyles. It seems that those who are best able to adapt to these changes will be the ones with the skills necessary to survive in our society. This study is designed to investigate whether or not a divide exists within the African American population concerning computer access in Johnson City, Tennessee. The study will also determine if age, education, income, and gender determine access to or use of computers.

Significance of the Study

This research is of great significance since other research suggests that minorities "have less access to computers and the Internet than whites" (Ono & Zavodny, 2002). There have been many completed studies that focus on the "digital divide" between different ethnic groups. A report done by the U. S Department of Commerce in October of 2000 suggests that a divide still exists "between those with different levels of income

and education, different racial and ethnic groups, old and young, single and dual-parent families, and those with and without disabilities” (National Telecommunications and Information Administration 2000). Conversely, an article presented in *Black Enterprise* magazine cited that ethnicity played “little role in home computer purchasing” (Parrish, 1997). They credit the disparity to differences in income level and education. In an attempt to understand the divide between the races, Novak & Hoffman, (1998), investigated the differences between whites and African Americans in the United States with respect to computer access and use. Their investigation found access to a home computer strongly correlated to the average income of the household.

A review of the literature surrounding this topic has clearly overlapped in certain areas. Though there seems to be a definite gap between the haves and the have-nots when it comes to computer access, there also seems to be very definitive similarities as to the factors that determine this. These special demographic differences, namely, gender, education, household income, and age, will also exist not only between different ethnic groups but also within a specific ethnic group.

Definition of Terms

Since its inception, the word computer has come to incorporate many different devices. For the purpose of this study, the word *computer* refers to the combination of a CPU (Central Processing Unit), monitor, and keyboard.

Access: The right or ability to obtain, make use of, or take advantage of something.

African American: A person having origins in any of the Black racial groups of Africa. It includes people who indicate their race as "Black, African American, or Negro," or provide written entries such as African American, Afro American, Kenyan, Nigerian, or Haitian.

E-Mail: Electronic communications between two or more individuals by way of an Internet Service Provider

Digital Divide: The division between people who do and people who don't have access to and the capability to use modern information technology such as the telephone, television, computer, and the Internet.

Internet: An international connection of computers for the purpose of communications and the sharing of information

White: A person having origins in Europe, and people who indicate their race as "White"

Assumptions

As with any type of research, assumptions were made prior to implementing this study. The following assumptions were made concerning this research and the data collection instrument:

1. It was assumed that the sample population used in this study would be a good representation of the African American population in Johnson City, Tennessee.
2. It was assumed that persons taking the survey were literate and could fully comprehend the questions being asked.
3. It was assumed that the participants would respond truthfully to the survey.

Limitations

1. The survey was limited to African American adults, 25 years and older.
2. Data Collection was limited to persons living in Johnson City, Tennessee.
3. As Johnson City's African American population is quite small (6.4%), many participants may be of the same household.
4. Data Collection was limited to churches, local organizations, and colleges/universities in Johnson City, Tennessee.

CHAPTER 2

LITERATURE REVIEW

Introduction

A 1999 study, conducted by the National Telecommunications and Information Administration, shows that more Americans are now connected to the Internet than ever before. According to Adams (2000), information technology is changing the way Americans communicate, learn, and work. The competitive advantages for those with Internet access he says is becoming increasingly obvious. Cooper (2000) points out that “households that do not have access have more difficulty conducting their daily activities...They become less effective consumers and citizens relative to their fellow citizens who have access” (p. 15). Cooper says that they are, in effect, disconnected, disadvantaged, and disenfranchised. According to another article, “tomorrow’s workers who want to stay employed, or be re-employed, will need the skill of learning new skills. Technology will be the common link among most of tomorrow’s jobs” (Gaines, Johnson & King, 1996). That same article found that future employers are looking for workers with expansive technical skills in communication, problem-solving and production and the ability to effectively use new technologies. Although it may seem extremely important to develop the knowledge and skills necessary to be familiar with basic computer literacy, this is simply not enough. Gaines et al. (1996) explain; “learning about computers has changed to learning with computers” (p. 75). If African Americans are to be the valuable and productive people needed for advancement in

today's society, they must possess the skills needed for the future. Computers must become an integral part of their lives.

History of Computers and the Internet

The modern computer as we know it today started in the 1940s. “The word ‘computer’ originally meant a person who solved equations; it was only around 1945 that the name carried over to machinery” (Ceruzzi, 1998, p. 1). Computer technology began during World War II, when a team of scientists and engineers at the University of Pennsylvania invented a general-purpose electronic digital calculator known as ENIAC, or Electronic Numerator, Integrator, Analyzer, and Computer (Augarten, 1984, p.3). In 1962, the RAND Corporation began a research project designed to allow military command and control to be transmitted over communication networks. In 1965 a specialized computer network (NET) known as ARPANET was developed by the Department of Defense. The intent was to provide scientists a means of sharing data and access to remote computers. In 1969, four universities—Stanford Research Institute, the Universities of California at Los Angeles and Santa Barbara, and the University of Utah became connected.

The term “Internet” appears to have been used for the first time in 1982. Poysstick (2003) notes that the Internet (of which the World Wide Web is only one component) relies on the concept of *distributed* communications. Communication systems in the past were constructed on either *centralized* or *decentralized* networks. There was dramatic development by 1983, when the University of Michigan put the first name server online. By 1984, there were 1,000 machines on the Internet and by 1987 there were 10,000 hosts.

The World Wide Web was proposed by CERN Institute in 1992 “which would establish a common language to facilitate easier access to desktop computers. By this time, there were 1,000,000 hosts on the network” (Poysick, 2003, p. 8). The Internet was totally text-based until 1993, when MOSAIC, the first graphics-based web browser, was introduced. By the late 20th century, the Internet connected over 10,000,000 institutions and agencies in 150 countries in a communications network that has become an integral part of life in many countries around the world.

Online Uses

A survey conducted by the National Telecommunications and Information Administration in 2000 found that e-mail (electronic mail) was the most frequent online activity among Internet users. Their research estimates that about nearly 85% of all persons using the Internet at home used it for e-mail. Other activities reported by the NTIA as being popular were: searching for information, checking the news, taking a course and doing job related tasks. Surprisingly, online shopping was not one of the most popular uses of the Internet, although it was reported as the fastest growing segment of Internet usage in the United States (NTIA, 2000). They also found that age played a key role in determining who used the Internet for online shopping, noting that this activity was most popular (about 47.7%) with 25 to 34 year olds. The research also discovered that whites were more likely than African Americans to shop and pay bills online.

An NSF-funded project conducted by Jackson, Barbatis, Biocca, Zhao, Eye, and Fitzgerald, (2000) found that African Americans use the Internet for other web activities more than email. One hundred seventeen participants of a low-income, medium size

community were asked to participate in the study. Participants were given a computer and Internet service. Internet use was continuously logged and participants were asked to complete surveys at several intervals during an 18-month period. Of those adults who were involved in the study, 67% were African American. Researchers found that most people used the Internet for pleasure, such as communicating with family and friends, tracking sports, listening to music, and playing games. Results from the study, show that African Americans were less likely to go online in a typical day than European Americans (36% versus 56%). African Americans were more likely to listen to music, seek religious information, play games, download music, seek information about jobs, seek information about a place to live, and conduct school research and job training.

Consumer research done in January of 2003 concerning African Americans online indicates that the top 10 sites visited by African Americans are comprised of various cultural, entertainment, and educational sites (African Americans Online, 2003). BlackPlanet.com was the top online destination with around 75% (892,000) African American visitors. Zjamz.com (a music site) was the second most visited site with about 71% of its attention coming from African Americans.

African American Culture

The African American population comprises a significant part of the United States. A recent online article stated that more than 10 million African Americans are online, comprising almost 8% of the total home and work combined online population (African Americans Online, 2003). A recent article in the *Journal of Business Ethics* cites that there are 36.4 million African Americans, approximately 12.9% of the total

U.S. population (Swaiden, Vitell & Rawwas, 2003). The same source noted that since 1990, the number of African Americans has increased by five million people, (16% growth) while the total U.S population has grown only 11%. African Americans themselves increased their numbers by 22%. America's minority populations promise to have the same impact in the next 50 years that Baby Boomers have had for the past 50 (Anderson, 2002). Demographically, African Americans have a younger median age of 26.5 years than do white Americans who have a median age of 36.5 years

According to the last US census in 2000, African Americans in Johnson City Tennessee make up about 6.4% (about 3,549 residents) of the entire population (55,469). Since the 1990 census, the population in Johnson City has experienced a drastic boost. The population has grown by more than 6,200 people over the past 10 years with African Americans accounting for about 12% of that growth.

Religious/Cultural Identity

The African American culture is one that thrives on a firm religious background (Brown & Gary, 1991; Littlejohn-Blake & Darling, 1993). Brown and Gary note, "for decades social scientists and researchers have documented the distinctive role of religion in the lives of African Americans (Billingsley, 1968; Boyd-Franklin, 1980; Lincoln & Mamiya, 1990)" (p.412). Through their research and review of literature, Brown and Gary have found several social functions that religion serves African Americans. These include:

- (1) Psychological affirmation (provides a source of personal comfort and consultation, emotional support, etc.);

- (2) Identity (links the individual to the past and the future; provides group values, a place in the universe, and a sense of recognition or “somebodiness”);
- (3) Social support (provides advice, material aids and services, exchange of services and assistance);
- (4) Protest (provides political education, advocacy, and political ideology);
- (5) Economic activity (provides employment opportunities, expenditures for church operations, and fund raising);
- (6) Education (provides Sunday school, adult education seminars, and forums for development of leadership and organized skills);
- (7) Creativity (promotes the development of spirituals, plays, rich and poetic sermons, and gospel music); and
- (8) Social intercourse (sponsors picnics, church dinners, sports, informal gatherings, sharing, rehearsals, and church trips). (p. 412)

Researchers Littlejohn-Blake and Darling (1993) characterize the “religious orientation” as an “awareness of and commitment to a spiritual life-style that provides a sense of power and purpose greater than self” (p.461).

African Americans have a more complex set of household demographics than do their white counterparts. African Americans have more single parent families (54%) than whites and tend to have larger extended family households (Kamo, 2000). According to Kamo, there are several variables that relate to the high rate of extended families among African Americans. Her research found that finances and education had strong correlations to extended families. Less educated families were more likely to be extended and persons with larger incomes were less likely to be living in extended family

households as a dependent member. Littlejohn-Blake and Darling (1993) see the extended family as a “major source of stability and fortitude” (p. 462).

The Digital Divide

The Digital Divide is a problem that has been on the rise for several years. When the term “Digital Divide” was coined, it described a presumed problem of uncertain dimensions (Stone, 2003). At that time, policymakers speculated that the Web, which was dominated by wealthy, white males, might exacerbate societal divisions of race, income, gender, and education (2003). This view is one that has been researched and documented by several authors (Autor, Katz, & Kreuger 1998; Holloway 2000). The digital divide is one that exists not only between ethnic lines but also within. Many believe that the division between the “haves” and the “have-nots” (Novak & Hoffman, 1998) is one driven by income and educational levels.

Income

Novak and Hoffman (1998) found that computer ownership was directly related to the level of income in a household but that ownership was still very racially biased. Hoffman found that for households earning less than \$40,000, whites were twice as likely to have a computer; however, for households earning more than \$40,000, African Americans were slightly more likely to have a computer at home and at work. Hoffman therefore contends “to achieve parity [in home access to the Internet], African Americans have to be much better educated, wealthy, and work in computer-related professions” (Raloff, 1998, p.247). The National Telecommunications and Information

Administration (NTIA) has been tracking this digital divide since 1994 and most recently reported that gaps between groups based on income levels, educational levels, and geographic locations began to shrink dramatically at the end of the last decade (NTIA, 2000). The NTIA reported that by August 2000, 51% of American households owned computers, compared to 42% in 1998, and 41.5% had access to the Internet at home, compared to 26.2% in 1998. The NTIA 2000 survey found that 85% of households with incomes of \$75,000 and higher have a computer at home, compared to just 19% of households in the \$15,000- and-under income bracket. Similarly, 78% of households at the highest income levels have Internet access, compared to only 13% of low-income households. In addition, there is a significant racial digital divide, with Blacks and Hispanics continuing to experience the lowest household Internet penetration rates, at 23.5% and 23.6%, respectively, compared to 46.1% among whites.

The National Telecommunications and Information Administration (NTIA) also found through their 2000 survey that “the makeup of a household – such as the presence or absence of children, and whether there are one or two parents – is also associated with the household’s likelihood of having computer and particularly Internet access” (p.17). Their research shows that households that have two parents and children have much higher rates of Internet access than other family types. Two parent households were nearly twice as likely to have Internet access as single-parent households (60.6% for dual-parent, versus 35.7% for male-headed households with children less than 18 years of age, and 30.0% for female-headed households with children less than 18 years of age).

These statistics are well founded in light of the fact that two-parent households are more likely to have a greater income than households headed by one person.

Geographic/School Location

The NTIA survey (2000) reported that Americans living in rural areas continued to lag behind their urban and suburban counterparts. Although the gap narrowed from 4.0 percentage points in 1998 to 2.6 percentage points in 2000, low-income rural households continue to have the lowest rate of Internet access, 11.3%, compared to low-income households in other geographic areas.

Although these findings are supported by other studies, (Blanchard, 2000; Borgida et al., 2002), whites are still more likely to have access to the Internet, regardless of income level. A survey conducted by Hoffman & Novak in 1998 suggests that the digital divide is not limited to the home and may account for the large divide between whites and their counterparts. Their results are reflected in the following statements as cited by Holloway (2000):

Even without a computer in the home, white students were more than twice as likely as similar African American students to have used the web in the past six months and more than three times as likely to have used the web in the past week.... White students who lacked a home computer gained access to the Internet at such locations as homes of friends and relatives, libraries, and community centers, whereas African American students did not. (p. 90)

Computers are now playing a vital role in educating students across the globe. A recent survey by the National Center for Education Statistics (2000) found that public schools have nearly reached the goal of connecting every school to the Internet. However, (Feldman, 2001), notes that “although great strides have been made in increasing access

to and use of technology, the digital divide has only been exacerbated within the schools. Based on 1999 survey data, researchers from the National Center for Education Statistics found that limited access was widespread. Ninety-nine percent of all public school teachers reported having computers available somewhere in their schools: 84% had computers in their classrooms, with 36% having one computer, 38% having two to five computers, and 10% having more than five computers in their classrooms. Those schools with more minority and low-income students continue to have more limited access to technology.” Holloway (2000) supports these finding in his article, where he shows dramatic differences in levels of Internet access. In schools with high concentrations of poverty (71% or more students eligible for free or reduced-price lunches), 39% of instructional rooms had Internet access compared with 74% of instructional rooms in schools with lower concentrations of poverty. The percentage of instructional rooms with Internet access in public schools with high concentrations of poverty did not increase between 1998 and 1999; although the percentage of connected instructional rooms in schools with lower concentrations of poverty did increase. The digital divide for poor and minority people also persists outside the classroom (Edelman, 2001).

Education

According to the NTIA (2000), home and Internet access rates vary by the educational level of a person and better-educated adults are more likely to use and become familiar with computers.

In December of 1998, 53.8% of households headed by a person with education beyond college had Internet access. Persons with a bachelor’s degree had an access rate

of 46.8% followed by those with some college experience (30.2%). Individuals with less than a high school diploma had only a 5% access rate. In the year 2000, results showed that almost 70% of households headed by someone with post-college education had Internet access while only 11.7% of those with less than a high school degree did.

Research from the National Center for Education statistics (2000) showed that in the 1999–2000 academic year, African Americans earned a slightly higher %age of associate degrees than bachelor’s degrees (11% versus 9%), about 8% of master’s degrees and 5% of doctoral degrees.

Gender

In a recent study of student attitudes towards computers, Young (2000) found the computer gender gap to be one that begins at an early age. She notes that previous studies indicate that this attitude stems from children, teachers, and parents perceiving computers as male oriented.

Boys have substantially more computer exposure at both home and school (Fetler, 1985; Gilliland, 1990; Siann et al., 1990) and are more likely to participate in activities such as computer camps or after-school computer clubs (Hess & Miura, 1985). Boys have been found to dominate computer use in schools and to engage in elective programming activities more than girls (Becker & Sterling, 1987; Siann et al.) (p. 2).

Hakansson (1990) writes that our culture is to blame for the evident gender bias associated with computers.

Women are not encouraged to learn about machines, and computers are machines. Being analytical, mathematically proficient, and having the ability to use logical thinking skills are not the traditional traits we associate with desirable women As long as girls in their teens aspire to be accepted and desirable, and as long as their role models are the ones presented on TV situation comedies, the situation will not change. (p. 126)

According to the U.S. Bureau of Labor statistics, only 28% of women hold technical jobs. The Institute for Women and Technology recently reported that the number of women graduating with bachelor's degrees in computer science is around 27%. DeBare (1996) cites that women only occupy about 35% of the "high-tech work force" and just over 10% of "top-tier executive positions" in Fortune 500 companies. It seems that indeed men are the forerunners when it comes to computers and computer technology.

Research by the National Center for Education statistics shows that a higher percentage of African American women were enrolled in colleges and universities than their white counterparts (63% versus 56%). In fact, African American females accounted for nearly two thirds (63%) of the total African American enrollment in colleges and universities in 2000. This is a much higher proportion than the male enrollment (37%) and higher than the proportions of female enrollment in all other racial/ethnic groups.

CHAPTER 3

METHODS

Introduction

This study attempted to determine how much access African Americans in Johnson City, Tennessee had to computers and which demographics influenced such access. The hypothesis/research questions and methods used to obtain and analyze the data for the research process will be presented in this chapter.

Scope of the Study

The purpose of this study is to discover whether a “digital divide” exists within the African American population in the Johnson City area. A sample of the population received a survey with specific questions about their access to computers and computer activities. A thorough examination of the results will help to determine whether African Americans of a certain age group, gender, household income, or educational level had more access to computers and the Internet.

Design of the Study

Data collection for this study began with generating a list of the major African American churches and organizations as well as the housing districts in Johnson City, Tennessee. Research concerning African Americans suggested that they are very connected to their church; therefore, a great number of African Americans will be found in churches. The local churches comprised of Grace Temple Church, West Main Street

Christian Church, Greater Love Church of God, St. Paul A.M. E. Zion, Friendship Baptist Church, Thankful Baptist Church, Bethel Christian Church, Church of Our Lord and Savior Jesus Christ, New Zion True Gospel Tabernacle, and Open Door Tabernacle. Local organizations were the NAACP (National Association for the Advancement of Colored People), UMOJA club, and the Protoclub. The primary housing districts were Keystone and Carver. This list was the main tool that determined the population of the study and the subjects for this research were drawn from the African American population in Johnson City, Tennessee.

Description of the Population

The population for this study was limited to African Americans living in Johnson City, Tennessee. In order to determine the number of residents in the area, a demographics site for the area was accessed. The site, www.areaconnect.com was used to find the demographics for Johnson City, Tennessee. According to the information gathered, it was determined that the number of African Americans in Johnson City, Tennessee was 6.4% of the total population or 3,549 persons. In addition, the demographic information was also categorized by ages. The highest percentages of persons in the area, both male and female, were found to be within the ages of 25–34 (13.86%), 35-44 (14.22%), and 45-54 (13.22%). The population of persons living in the area above or below those ages was significantly less, with no age category above 10%. The sample for this research was thus comprised of persons 25 years of age and older.

Data Collection Procedures

The population for the study was obtained by administering the questionnaire to individuals. To reach this population, leaders from local churches, businesses, and organizations were contacted and given a description of the project. Special times were then be organized, (after church services and during other organizations' meetings) to hand out the survey to participants. In addition, the survey was mailed out to all African American faculty/staff members as well as students' aged 25 years or older at East Tennessee State University. Local events that were thought to attract large groups of African Americans were also targeted. Once a group of participants was established, they were given two copies of the informed consent document and one copy of the questionnaire. Participants were then given the opportunity to read over the informed consent document that described the research before completing the survey. The consent document and the questionnaire were read to any persons who were unable to read for themselves. Participants were instructed to sign the consent forms and keep a copy for themselves and return the other copy with the completed questionnaire. This process resulted in 271 surveys that were analyzed.

Data Analysis Procedures

Once all of the surveys were collected, they were each numbered. After all of the surveys were numbered, a coding system was then applied to each survey to be entered into an excel worksheet. The coding system was developed by the primary investigator, an African American woman, and the data were entered into the excel worksheet with help from a graduate research assistant, a Caucasian male. After all data were entered

into the computer, the Statistical Package for the Social Sciences (SPSS) was used to analyze the results. There were 10 questions on the survey. Each response for a particular question corresponded to a number.

Hypothesis/Research Questions

Many researchers have explored the issues of a “digital divide” based on ethnicity citing clear distinctions between ethnic lines, due to several demographics such as income, age, and gender. While some researchers (Akhter, 2003) have suggested that such a divide may also exist within a specific ethnic group, such research is not very extensive. Due to the growing importance of computers and the Internet in today’s society, further research is needed to ensure that the African American community is not left behind. The author of this study attempts to further the understanding of the divide that is taking place within such groups. In order to do so, the following research questions and hypotheses were developed.

Research Question 1: How much access do African Americans in Johnson City have to computers?

Research Question 2: Which demographics within the African American community will influence access to computers?

Research Question 3: What activities do African Americans most use their computers to perform?

Hypothesis 1: Computer access to African Americans will be low in compliance with the national average.

Hypothesis 2a: Computer access will increase with higher levels of education.

Hypothesis 2b: Computer access will increase with higher levels of income.

Hypothesis 2c: Computer access will decrease as age increases.

Hypothesis 2d: Men will have more access to computers than women will.

Hypothesis 3: Computer activities will be geared towards email and research.

CHAPTER 4

RESULTS

Introduction

This chapter discusses the results of the data analysis of the 271 people surveyed in Johnson City, Tennessee between November 16, 2003, and February 13, 2004. The statistical data were used to determine if the hypotheses presented were supported.

Reporting of Data

The frequencies of men and women were not distributed evenly. Table 1 shows that women represented 62.4% of the sample and men accounted for 37.6%.

Table 1
Population Distribution by Age

Age						
	25-29	30-39	40-49	50-59	60+	Total
Male (102)	11	19	29	23	19	101
Female (169)	11	33	45	44	35	168
Total	22	52	74	67	54	269
Income						
Less than \$15,000	9	7	10	7	11	44
\$15,000-24,999	3	7	9	10	14	43
\$25,000-34,999	1	9	10	9	13	42
\$35,000-49,999	5	12	14	13	7	51
\$50,000-74,999	-	8	14	16	3	41
\$75,000 and above	4	7	13	10	3	37
Total	22	50	70	65	51	258
Education						
Less than High School	-	1	5	2	10	18
High School Graduate	2	18	21	35	24	100
College Graduate	11	21	28	17	12	89
Post Graduate	9	12	19	12	8	60
Total	22	52	73	66	54	267

Note: N=271, but totals may not reflect N value because some data were not reported

As shown in Figure 1, all age categories were well distributed with the exception of persons 25-29 years old. The highest numbers of the sample in both genders were represented by persons' aged 40-49, followed closely by persons 50-59 years of age. Persons 25-29 were the least represented in this study.

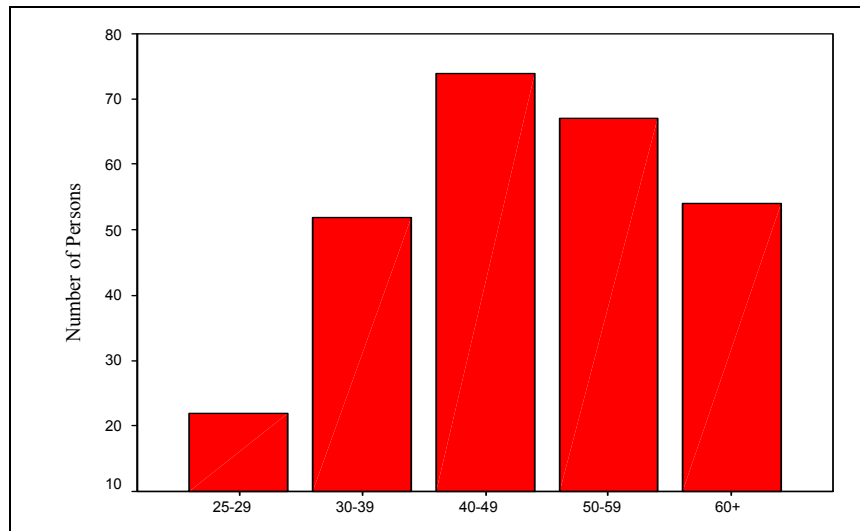


Figure 1. Chart of Population Distribution by Age

Income was almost proportionately distributed throughout the population. Around 40 persons represented each group; however, persons with an annual household income of \$35,000-49,999 represented the largest group at close to 20%. Persons between the ages of 40-59 reported had higher annual incomes than their younger counterparts.

The education data in Table 1 and Figure 3 show that a large number of those surveyed (37.4%) had completed a High School education while 89 persons reported being college graduates. A little over 20% (60 persons) of the surveyed population reported having done Post Graduate Work. Only a very small number of those surveyed (18 persons) reported not having completed high school.

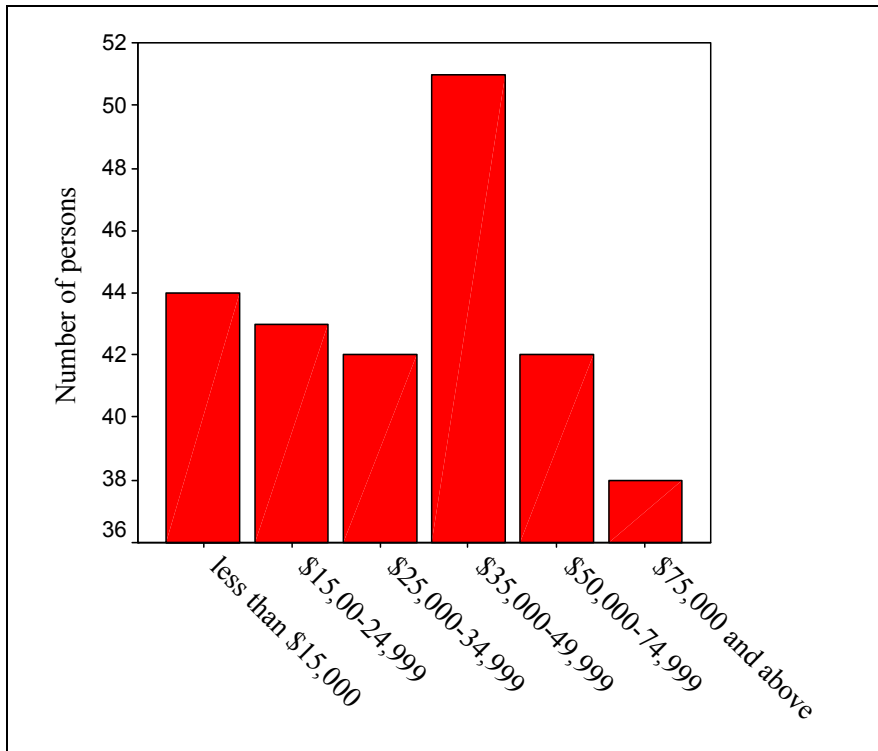


Figure 2. Chart of Population Distribution by Income

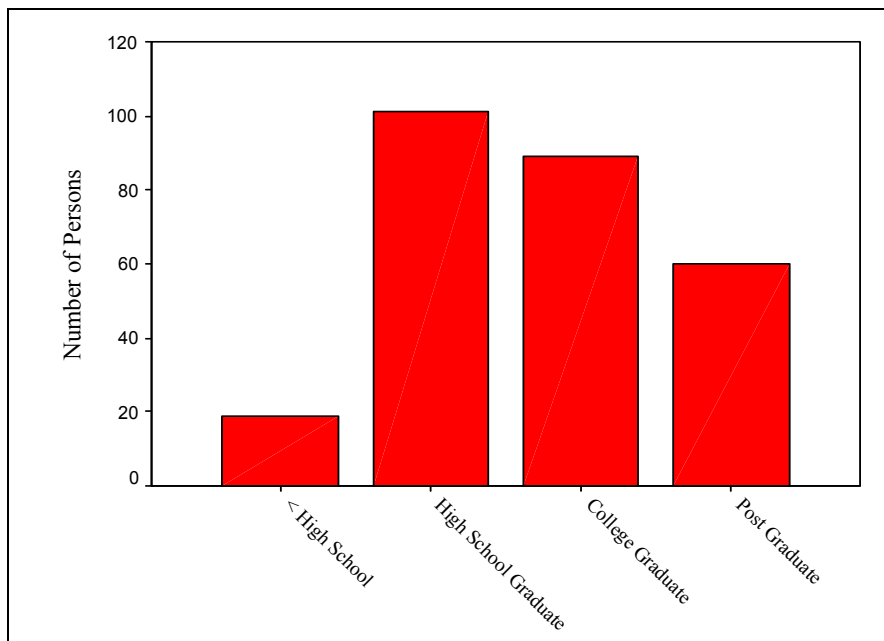


Figure3. Chart of Population Distribution by Education Level

Hypothesis 1 stated that computer access to African Americans would be low in comparison to the national average. This hypothesis was not supported, as shown in Table 2. The results showed that of the 271 persons surveyed, 78.6% (213 persons) had access to a computer at home. In regards to computer access at work, 71.2% of the population surveyed had a computer at work. A Z-test analysis was done to determine if Hypothesis 1 (proportions of sample with local access to computers = proportion of nation with access to computers) would be supported. According to the NTIA, during their last survey in 2001, African American access to a computer at home was 37.1%. The Z value was calculated as follows:

$$z = \frac{P - P_o}{\sqrt{\frac{P \cdot Q}{n}}} = \frac{0.786 - 0.371}{\sqrt{\frac{(0.786)(0.214)}{270}}} = 16.63$$

where $Q = (1-P)$, P =actual results, P_o =expected results

Based on a p being <0.05 , it was determined that Hypothesis 1 could not be supported.

Table 2
Frequency of Computer Access at Home and Work

		Frequency	Percent
Home Computer	Yes	213	78.6
	No	57	21.0
Work Computer	Yes	193	71.2
	No	48	17.7

Note: N=271 however, percentages may not add up because some data were not reported

A cross tabulation of Home and Work computer as shown in Table 3 revealed that of the 240 cases, 70% (168 persons) had access to a work computer as well as a home computer. Only a small percentage (10.8%) did not have access to either.

Table 3
Home and Work Computer Cross tabulation

		Work Computer		Total
		Yes	No	
Home Computer	Yes	70.0% (168)	9.2% (22)	79.2% (190)
	No	10.0% (24)	10.8% (26)	20.8% (50)
Total		80.0% (192)	20.0% (48)	100% (240)

Note: Valid N=240

Hypothesis 2a stated that computer access would increase with higher levels of education. This hypothesis was supported by the data collected. A null hypothesis that computer access would show equal proportions across all education levels was tested and rejected at the 0.05 level. As is evident in Table 4, only about 56% of the respondents with less than a high school degree had a computer at home while 70% of those with a high school degree had access to a computer at home. Almost 88% with a college degree had a computer at home and 90 % of persons with a postgraduate degree had a home computer.

Table 4
Home Computer and Education Cross tabulation

		Education			
		Less than High School	High School Graduate	College Graduate	Post Graduate
Home Computer	Yes	55.6% (10)	70.0% (70)	87.8% (79)	90.0% (54)
	No	44.4% (8)	30.0% (30)	12.2% (11)	10.0% (6)

N=269; Chi-square=19.697; df=3; p<0.05

The data results are even more compelling for access to a computer at work as shown in Table 5. Only about 29% of those surveyed with less than high school education had access to a work computer. For persons with a high school degree, computer access at work was 71.3%, while college graduates were 90%. Persons with postgraduate education had an increase of around 5 percentage points for computer access at work.

Table 5
Work Computer and Education Cross tabulation

		Education			
		Less than High School	High School Graduate	College Graduate	Post Graduate
Work Computer	Yes	28.6% (4)	71.3% (62)	90.0% (73)	94.7% (54)
	No	71.4% (10)	28.7% (25)	10.0% (8)	5.3% (3)

N=239; Chi-square=41.314; df=3; p<0.05

Hypothesis 2b stated that computer access would increase with higher levels of income. A null hypothesis of equal proportions across income levels was tested using the χ^2 (chi-square) test. The hypothesis was rejected at the 0.05 level. As shown in Tables 6 and 7, an examination of the observed cell frequencies demonstrates that a higher number of respondents in the upper income levels had access to computers than in the lower group. As expected, the lowest computer access was experienced for persons earning less than \$15,000 annually for both home and work access. Exactly half of the population surveyed in that group (50%) had a computer at home while the other half did not. Nearly 70% of respondents earning between \$15,000 and \$24,999 had a computer at home compared with about 81% of persons earning \$25,000-34,999. Access increased

by 7.1 %age points for the \$35,000-49,999 income bracket. The highest level of computer access for the total population was determined to be in the salary range of \$50,000-74,999 for access both at home and work (95.2% and 97.3% respectively).

As stated in the hypothesis, access to computers did increase steadily with higher levels of income except in the salary range of \$75,000 or more. Access within this income category was nevertheless substantially high for both computer access at home and work (92.1% and 88.9% respectively).

Table 6
Home Computer and Income Cross tabulation

	Income					
	Less than \$15,000	\$15,000-24,999	\$25,000-34,999	\$35,000-49,999	\$50,000-74,999	\$75,000 and above
Home Computer Yes	50.0% (22)	69.8% (30)	80.9% (34)	88.0% (44)	95.2% (40)	92.1% (35)
No	50.0% (22)	30.2% (13)	19.1% (8)	12.0% (6)	4.8% (2)	7.9% (3)

N=259; Chi-square=37.858; df=5; p<0.05

Apart from the aforementioned exception, increased access to a computer at work, with income level growth, did not vary much as found in Table 7. Although the population was slightly smaller (233 persons), the data across all income categories were distributed almost similarly to the data for home computer access. Nearly 81% of those surveyed had access to a computer at work. Computer access at work, for those earning less than \$15,000 annually was 40.5%. Nearly 70% of respondents earning between \$15,000 and \$24,999 had a computer at work compared with close to 89% of persons earning \$25,000-34,999. Access for persons earning \$35,000-49,999 and \$50,000-74,999

was 95.8% and 97.3% respectively. Computer access at work for persons earning more than \$75,000 was 88.9%.

Table 7
Work Computer and Income Cross tabulation

	Income					
	Less than \$15,000	\$15,000-24,999	\$25,000-34,999	\$35,000-49,999	\$50,000-74,999	\$75,000 and above
Work Computer Yes	40.5% (15)	68.4% (26)	88.9% (32)	95.8% (46)	97.3% (37)	88.9% (32)
No	59.5% (22)	31.6% (12)	11.1% (4)	4.2% (2)	2.7% (1)	11.1% (4)

N=233; Chi-square=58.897; df=5; p<0.05

Hypothesis 2c stated that computer access would decrease as age increased. This hypothesis was supported by the data found in Tables 8 and 9. Computer access in the home did show a definite decline as participants' ages increased. This hypothesis was tested using the chi-square test. The cell frequencies show that over 95% of persons 25-29 had access to a computer at home. Access to home computer within the age group 30-39 was 88.4% and 74.3% for those 40-49. This decline sees a slight rise in the age group 50-59 at 80.5% but drops significantly by 13.8 percentage points for those 60 and over.

Table 8
Home Computer and Age Cross tabulation

	Age				
	25-29	30-39	40-49	50-59	60+
Home Computer Yes	95.2% (20)	88.4% (46)	74.3% (55)	80.5% (54)	66.7% (36)
No	4.8% (1)	11.6% (6)	25.7% (19)	19.5% (13)	33.3% (18)

N=268; Chi-square=12.049; df=4; p<0.017

Computer access at work showed the same trends as computer access at home. Overall, nearly 80% of all persons surveyed (191/239 persons) had access to a computer at work. The lowest percentage for access to a computer at work (50.0%) came from persons 60 years and older. Eighty-six percent of persons 25-29 had access to a computer at work. There was a slight decline for respondents within the age group 30-39 of about 0.4 percentage points and a larger decline of 3.6 percentage points for ages 40-49. A peak was observed for the age group 50-59 at 87.5%. However this age group was also observed to represent the upper income brackets.

Table 9
Work Computer and Age Cross tabulation

		Age				
		25-29	30-39	40-49	50-59	60+
Work Computer	Yes	86.4% (19)	86.0% (43)	83.6% (61)	87.5% (49)	50.0% (19)
	No	13.6% (3)	14.0% (7)	16.4% (12)	12.5% (7)	50.0% (19)

N=239; Chi-square=25.523; df=4; p<0.05

Hypothesis 2d stated that men would have more access to computers than women. This hypothesis was not supported as shown in Tables 10. In fact, computer access was almost equal for both genders at home and work. A total of two hundred and seventy responses (169 women and 101 men) were collected for home computer access. A slightly smaller total of 241 responses (149 women and 92 men) were analyzed for access to a computer at work. Males had an access rate of 80.2% at home and 79.3% at work. Women had an access rate of 78% at home and 80.5% at work.

Table 10
Gender and Home/Work Computer Count Cross tabulation

Gender	Home Computer		Total	Work Computer		Total
	Yes	No		Yes	No	
Female	78.1% (132)	21.9% (37)	100% (169)	80.5% (120)	19.5% (29)	100% (149)
Male	80.2% (81)	19.8% (20)	100% (101)	79.3% (73)	20.7% (19)	100% (92)

N=270 for Home Computer; N=241 for Work Computer

Hypothesis 3 stated that computer activities would be geared towards email and research. This hypothesis was supported by the data in Table 11. Email usage was the number one activity reported at close to 75% followed by research (60.5%). Surfing was the third most frequent activity by African Americans at 42.8% followed closely by online shopping. The least frequent activity reported was desktop publishing, which was only done 21.8% of the time. Gaming and online banking had approximately the same amount of usage. Of the 271 persons surveyed, 87 (32.1%) indicated that they used their computer for playing games and 86 (31.7%) indicated that they did online banking.

Database management had a frequency of 27.3%.

Table 11
Frequency of Computer Activities

Activity		Frequency	Percent
Email	Yes	203	74.9
	No	68	25.1
Online Shopping	Yes	106	39.1
	No	165	60.9
Research	Yes	164	60.5
	No	107	39.5
Online Banking	Yes	86	31.7
	No	185	68.3
Surfing	Yes	116	42.8
	No	154	56.8

Gaming	Yes	87	32.1
	No	184	67.9
Desktop Publishing	Yes	59	21.8
	No	212	78.2
Database	Yes	74	27.3
	No	197	72.7

Note: N=271

Other questions were posed in order to determine how often computers were used, other places of use, and how important the subjects felt computers to be. Table 12 shows the results in regards to the question of when last they had used a computer. Around 76.8% of the respondents (208 persons) said it had been in the past week. Approximately 6% reported using the computer in the last month and 2.2% (6 persons) reported using the computer in the past 3 months. Less than 10% reported using the computer in the past 6 months.

Table 12
Frequency and Percent of Last Use of Computer

Last Use	Frequency	Percent
Past 6 months	23	8.5
Past 3 months	6	2.2
Past month	15	5.5
Past week	208	76.8

Note: N=253

When asked to identify locations other than home or work, 55% (149 persons) of those surveyed identified friends/relatives as another location to use a computer. The Public Library was the next most frequent location with 48.7% (132 persons). Church was cited as the next best location with 21.8% of the sample. Around 16% of the population said that they did not use computers at any other location.

Table 13
Frequency and Percent of Other Locations Used

Location		Frequency	Percent
No Other Location	Yes	43	15.9
	No	228	84.1
Public Library	Yes	132	48.7
	No	139	51.3
Friends/Relatives	Yes	149	55.0
	No	122	45.0
Church	Yes	59	21.8
	No	212	78.2

Note: N=271

The majority of persons surveyed said that computers were very important in their lives. As the data in Table 14 shows, around 39% gave importance a rating of 5 (extremely important). Around 25% indicated importance level as 4 (important), while nearly 18% said computers were somewhat important (rating of 3) in their lives. On the other hand, only a very small percentage of those surveyed indicated that having a computer was not important.

Table 14
Frequency and Percent of Level of Importance

Level of Importance	Frequency	Percent
1	26	9.6
2	18	6.6
3	48	17.7
4	68	25.1
5	106	39.1

Note: N=266

CHAPTER 5

DISCUSSION

Introduction

The purpose of this chapter is to discuss the major findings, present conclusions about the data collected from the survey results, and discuss recommendations for possible future research. Three research questions were posed in order to guide this study, and the data collected from the sample were used to answer those questions.

Summary of Major Findings

The first question that this study sought to answer concerned how much access the African American community in Johnson City, Tennessee had to computers. When certain variables are analyzed, income, education, and age are the three best predictors of access to a computer at home. Overall, this study revealed that African Americans living in Johnson City, Tennessee have a great deal of access to computers both in their homes and at the workplace. The data showed that of 271 persons surveyed, about 213 persons (78.6%) had access to a computer at home and 193 persons had access to one at work. These results are very surprising when one looks at the access rate to computers for African Americans across the nation (around 37%). Although it seems that computers are readily accessible to the African American community based on the data results, one must still realize that this study was limited. Many of the participants were either active members of an organization, avid churchgoers, or students/faculty/staff members of local

colleges/universities; thus the sample population may account for the unusually high access rate to computers.

The second question this study attempted to answer was which demographic, namely, age, gender, education, or income, was the main driving force to computer access. Four hypotheses were presented to answer this question. Hypothesis 2a stated that computer access would increase with higher levels of education. The data did support this hypothesis. Access to a home computer for persons with less than high school education was 55% while for persons with a high school degree access was 70%. Respondents with college and postgraduate degrees had more access to computers than did those with simply a high school education, 88% and 90% respectively at home. Perhaps one reason for this trend can be attributed to the fact that most colleges and universities introduce computers to their students. Computers are one of the most used tools in a college environment. College graduates understand not only how to operate a computer but also its importance as an everyday tool.

Another factor that may support the idea that higher education equals better access to computers has to do with the job market. The jobs of tomorrow are requiring better educated individuals with an expanded set of skills that includes computer skills. Persons with higher levels of education are in a better position to receive jobs that require the use of a computer. This would account for the high access rate in the workplace for respondents with basis college education and higher degrees. The study revealed that 54 of 57 persons with postgraduate degrees had access to a computer at work. Seventy-three of 81 college graduates had access to a computer at work. When compared with the access rates for persons with less than a high school education (4 of 14), and those with

only high school education (62 of 87), we can see that education plays a major role in access to computers and is a vital demographic of this research.

The second hypothesis, 2b, stated that computer access would increase with higher levels of income. Not only did this study confirm this hypothesis, but also the results showed that of all the demographics analyzed, income was one of the central determinants of access. The economic situation of the household was the primary driver of computer ownership at home. At the lowest income level, less than \$15,000, only 50% (22 respondents) owned a computer at home. The next category of \$15,000-24,999 had an increase of 20 percentage points, setting the mark at 70% computer access at home. This trend continued for each consecutive category. The \$25,000-34,999 category had 81% access whereas an additional 7 percentage point increase (88%) was observed at the \$35,000-49,999 level. The next category \$50,000-74,999 had the highest level of computer access of the total population with 95% computer access. Respondents making \$75,000 and above had 92% computer access. This slight decrease in access for this category may be due to the smaller sample size collected.

Hypothesis 2c stated that computer access would decrease as age increased. The youngest age group had the highest computer access overall, (95% at home and 86.4% at work), while the oldest age group had the least access (66.7% at home and 50% at work). There were unexpected peaks for persons 50-59 for access to computers at home and work. One possible explanation for the unexpected peak could be because this age group also had the highest annual income. This age group can be classified as the baby boomer generation. “Boomers, as a group, are more highly educated and, compared to their parents' generation, much better off financially” (Fry 2003). More Baby Boomers are

working past retirement. Fry reported that 8 out of 10 boomers plan to work at least part time during retirement. According to the same source, workers 55 and older numbered 16 million in 1996 and are expected to reach 22.2 million in 2005. Baby Boomers need more money than their parents' generation to live comfortably and their generation is more self-indulgent. Having technological items such as a computer would seem to be appealing to this generation.

Hypothesis 2d stated that men would have more access to computers than women. This analyzed population did not support this hypothesis. African American men and women had close to equal access to computers. Men had an access rate of 80.2% at home and 79.3% at work while women had an access rate of 78% at home and 80.5% at work. One explanation for this trend could be that the fact that the sample consisted of persons over age 25, many of whom may have been married and/or perhaps members of the same household; thus access would be the same. In addition, more African American women (63%) are enrolled in colleges and universities.

Hypothesis 3 stated that computer activities would be geared towards email and research. Email usage was indeed the number one activity reported at close to 75% followed by research (60.5%). Surfing was the third most frequent activity by African Americans at 42.8% followed closely by online shopping. The least frequent activity reported was desktop publishing, which was only done 21.8% of the time. These results are not surprising when compared with other studies. According to The National Telecommunications and Information Administration (2000), 85% of persons using the Internet at home use it for email.

Conclusions

Overall, people are realizing the benefit of being able to communicate to friends and family quickly and fairly inexpensively via email. The data in this study revealed that, in general, the sample population felt that computers play an important role in their lives. Nearly 40% of the sample said computers were important and close to 80% use computers on a weekly basis. The sample in Johnson City, Tennessee had an access rate of 78.6% to computers at home compared to 37.1% nationally. This raises questions as to what African Americans in Johnson City, Tennessee are doing differently than their counterparts nationwide.

Census information for Washington County, Tennessee, which is comprised of Johnson City and Jonesborough, suggest that the population may be the reason for these results. Almost 4% of the population belongs to African Americans. Although this percentage is quite small in comparison to the number of whites (93.7%), there is still a larger population of African Americans living in Washington County than in any of the other counties in the Tri-Cities Metropolitan area. According to statistics found in the *Facts 2003* pamphlet provided by the First Tennessee Development District (FTDD), Washington County experienced the highest increase in annual average weekly salary between 1998 and 2001 of 15 %age points. In fact, the median household income reported for Washington County in 1999 was \$33,116. Washington County is also has an advantage over other counties in terms of the ages of its residents. The majority of persons living in Washington County are between the ages of 25-44. Because the results of this study revealed that a larger number of younger persons had access to computers than their older counterparts, this could possibly account for the high rate of access to

computers. Data from the FTDD also showed that Washington County had the highest percentage of advanced degrees (8.2%), and bachelors' degrees (14.7%), of all counties in the Tri-cities metropolitan area. The author of this research believes that these demographics substantially contribute to the results of this study.

Although this analysis has determined that computer access is driven by certain demographics, access is not totally dependent on them. As stated earlier in the literature review, at similar household incomes, whites still access computers at a higher rate than African Americans through alternate venues. This is an important point to realize since there are other places that computers can be used. Around 55% of the sample said they used computers at friends/relatives. Forty-eight percent named the public library as an alternative source for computer access. Several respondents noted using computers at their local church.

These findings are important for the community to realize. African American parents need to appreciate the fact that computers are the future. The public library can be an excellent source for access to computers for persons who may not have access otherwise. Several local African American churches have already implemented computer labs for their congregation. These can be very useful for lower income families who may not have another medium to use a computer. In an effort to increase computer access for African Americans, more churches could endeavor to have a computer lab available for its members.

As a whole, African Americans need to embrace stronger values concerning technology. African Americans need to ask themselves whether the constant lag behind their white counterparts is always a product of low income, or in fact due to their values.

African Americans need to encourage their children at an early age to embrace the technology. If a computer is not available at home, then other sources such as the public library and community centers should be sought out. The value of computers can be taught at an early age. In order to acclimate older members of the African American community to computers, churches and other local organizations that already have computers, can have training sessions to bring their community members to a basic understanding of how to operate a computer and eventually use the machine to their advantage.

The results of this study have many implications for Johnson City, Tennessee. Local businesses can use these results to better target their consumers. For example, the results of this study showed that online banking, although it was not the most used activity, was done frequently (around 32%) by respondents. Local banks could ensure that this service was available to their customers to improve their services and productivity. An even higher percentage of respondents (39%) reported using the computer for online shopping. Perhaps advertising in this area could incorporate more world wide web in their media to promote higher access rates for online shopping and Internet usage.

The study revealed that the sample population of African Americans in Johnson City, Tennessee seem to know and understand the value of computers; however, there is still a great deal of improvement need in order to stratify these results to the entire African American population. Although the digital divide is one that will still persist among many, this study shows that certain demographics, education and income, strongly influence the difference between those who have access and those who do not. African

Americans need to equip themselves with a good education which will increase their chances of retaining better paying jobs, which will in turn lead to a higher use of computers. This study showed that income seemed to be one of the main driving forces of access to computers in the home and at the workplace. The old saying “money makes the world go ‘round” is definitely one that applies to computer access.

Recommendations for Future Research

This study adds to all the data available concerning the Digital Divide. However, there are still areas of this topic that need to be explored. Researchers interested in this topic could use this study as a foundation to conduct similar explorations. Additional research could be conducted to examine the connectivity level to the Internet in the home. Educators could perhaps look at the public school system in Johnson City to determine if there is a digital divide within the school system. This could be very important research for a school board or other school officials looking to create change.

Another aspect of this study that could be further explored is the impact of children in the home, or the number of persons in the household.

Such a study could expand to nearby cities such as Kingsport and Bristol and perhaps a comparison can be made with Johnson City. A comparison could be done based on counties to determine where potential needs are for better access. These data would be important to city managers and those in positions pertinent to the welfare of the community because they could implement positive changes to ensure that computer access and the digital divide become less of an issue for the society at large.

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APPENDICES

Appendix A: Questionnaire

1. Gender: Male _____ Female _____

2. Age: 25-29 _____ 30-39 _____ 40-49 _____ 50-59 _____ 60+ _____

3. Annual Household Income:
Less than \$15,000 _____ \$15,000-24,999 _____ \$25,000-34,999 _____
\$35,000-49,999 _____ \$50,000-74,999 _____ \$75,000 and above _____

4. Education: Less than High school _____ High School Graduate _____
College Graduate _____ Post Graduate _____

5. Do you have a home computer? YES _____ NO _____
If you answered no to question 5, do you plan to purchase one in the next 6 months? YES _____ NO _____

6. Do you have access to a computer at work? YES _____ NO _____

7. Have you used a computer at other locations? (Check all that apply)
No Other locations _____ Public Library _____ Friends/relatives _____
Church _____ Other public facilities (please specify) _____

8. When did you last use a computer? (Check only one)
Past 6 months _____ Past 3 months _____ Past month _____ Past week _____

9. Computer Activities (Check all that apply)
E-Mail _____ Online Shopping _____ Research _____
Online Banking _____ Surfing _____ Gaming _____
Desktop publishing _____ Database _____ Other (please specify) _____

10. On a scale of 1-5, (1 being not important and 5 being extremely important), how important is a computer in your life? (Please circle your answer)
1.....2.....3.....4.....5

Appendix B: Informed Consent Document

Page 1 of 2

PRINCIPLE INVESTIGATOR: Sonja Schreckenber

TITLE OF PROJECT: The Digital Divide: A study of the Intra-Ethnic divide within the African American Community in Johnson City Tennessee

This Informed Consent will explain about being a research subject in an experiment. It is important that you read this material carefully and then decide if you wish to be a volunteer.

PURPOSE

The purpose of this research study determine if certain members of the African American community are using computers more than others and why. The study will try to find out (1) how much contact African Americans have to computers (2) where African Americans are using computers and (3) what activities African-Americans use their computers for.

DURATION

The expected duration of the study will not exceed ten (10) minutes.

PROCEDURES

You will be given a ten-question survey and asked to either check or circle your responses.

POSSIBLE RISKS / DISCOMFORTS

There are no known risks or discomfort associated with participating in this study, however, you may choose not to answer any questions that make you feel uncomfortable. You may also withdraw from the study at any time.

POSSIBLE BENEFITS *and/or* COMPENSATION

There are no benefits; and no compensation will be given for participation in this study.

CONTACT FOR QUESTIONS

If you have any research related questions at any time, you may call Sonja Schreckenber at 433-2337 or Dr. Keith Johnson at 439-7810. If you have any questions regarding your rights as a research subject please contact the Institutional Review Board (IRB) at 423-439-6055.

Ver. 11/06/2003

_____ Subject Initials

PRINCIPLE INVESTIGATOR: Sonja Schreckenber

TITLE OF PROJECT: The Digital Divide: A study of the Intra-Ethnic divide within the African American Community in Johnson City Tennessee

CONFIDENTIALITY

Every attempt will be made to see that your study results are kept confidential. A copy of the records from this study will be stored in the department of Technology, Wilson Wallis Hall for at least 10 years after the end of this research. The results of this study may be published and/or presented at meetings without naming you as a subject. Although your rights and privacy will be maintained, the Secretary of the Department of Health and Human Services, the ETSU IRB, and research related personnel from the ETSU Department of Technology have access to the study records. Your records will be kept completely confidential according to current legal requirements. They will not be revealed unless required by law, or as noted above.

VOLUNTARY PARTICIPATION

The nature demands, risks, and benefits of the project have been explained to me as well as are known and available. I understand what my participation involves. Furthermore, I understand that I am free to ask questions and withdraw from the project at any time, without penalty. I have read, or have had read to me, and fully understand the consent form. I sign it freely and voluntarily. A signed copy has been given to me.

SIGNATURE OF VOLUNTEER

DATE

SIGNATURE OF INVESTIGATOR

DATE

VITA

SONJA E. SCHRECKENBERG

- Personal Data: Date of Birth: August 29, 1976
 Place of Birth: Montserrat, West Indies
 Marital Status: Married
- Education: Private and Public Schools, Montserrat, West Indies
 Valencia Community College, Orlando, Florida
 General Education, A.A., 1997
 East Tennessee State University, Johnson City, Tennessee
 Chemistry, B.S., 1999
 East Tennessee State University, Johnson City, Tennessee
 Liberal Studies, M.A., 2001
 East Tennessee State University, Johnson City, Tennessee
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- Professional
Experience: Chemistry Intern, Eastman Chemical, Kingsport, Tennessee
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