DIVERSITY ON THE INTERNET:
THE RELATIONSHIP OF RACE TO ACCESS AND USAGE

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***Paper presented at the Aspen Institute's Forum on Diversity and the Media, Queenstown, Maryland, November 5-7, 1997 and* appeared as a chapter in *Investing in Diversity: Advancing Opportunities for Minorities and the Media*, Amy K. Garmer (ed) The Aspen Institute, 1998)**

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1. INTRODUCTION

Background

In September 1993, the Clinton Administration launched a National Information Infrastructure (NII) initiative as a major policy initiative for the coming decades. The blueprint for this initiative is contained in a document which has come to be known as the *Agenda for Action.* With the establishment of the Internet as the basic technology behind the NII, the metaphor of the *information highway* has now become part of our national vocabulary. The policy questions surrounding the information highway can be discussed in terms of three key factors: access, resources and skills. These factors have become particularly critical in light of the provision of *universal access*, a term that has been borrowed from the past, when telephone technology was first introduced to the national scene. The question regarding universal access may be stated as follows:

> "[How] accessible is the new information infrastructure in terms of ubiquity, affordability, and usability, and how is accessibility paid for? The problem has been voiced not strictly as an issue of simple connectivity, as it was with the telephone system, but as explicitly linked to access of information." (Keller, 1997 p6/7).

Keller goes on to argue that information infrastructure is "an enabler of both free speech and efficient markets." (p.35) To quote further:

> "[Information infrastructure] can help overcome barriers to information and create opportunities to convene regardless of geographic, physical and financial constraints. Disparate ethnic, economic, political and other interest groups will find increased opportunity to organize and consolidate in the pursuit of their common interests. (p.35)

There is a growing concern that rapid technological developments will leave some groups lagging behind the others. The information technology revolution which began to sweep the country in the early 1980s, slowed a bit in the late 1980s but regained its momentum in the early 1990s, captured the imagination of the public and policy makers. During this period, the nature of the technology has changed dramatically prompting Krieg (1995) to

refer to the implications of the new technology as the "next cycle." His main concern is that:

> "While we are rapidly approaching the next cycle, the technology of the previous cycle has already bypassed the inner-city. Despite limited empirical study of these communities, it is clear that computerization, telecommunications, and mass media applications are dramatically underrepresented in distressed urban areas. This is especially true in homes, where personal computers are a rarity." (p.2)

Motivation and Research Scope

The question we ask in this paper is, does race matter in the use of the Internet and Internet-based technologies, in computer ownership, and in the degree to which the cyberrevolution has touched all racial groups, particularly African-Americans? Why is race an important question? It is well known that racial issues have dotted the course of United States history and much has been written and recorded regarding racial inequality and inequity. The information revolution is emerging as a major turning point in the economic, social and cultural arenas, and unless one has a sense of how the country as a whole is moving with respect to access and usage of the Internet, one cannot label this technological movement as a success. In the last thirty years, public consciousness has been aroused with regard to racial issues especially in matters of educational and employment opportunities. Because the computer and access to networked environments has an important impact on these two domains, any systematic investigation of this subject will guide both industry-wide and policy decisions.

Some early studies in the diffusion of computer technology have shown that income and education are the most important variables in terms of computer ownership. The consistency of these findings across various studies can be explained easily if one notes that for the average household, in the case of domestic technologies, investment in computing technology is the second highest after the automobile. In addition, working with computing technology means acquisition of special skills and levels of literacy that are above average. While income and education seem to have been identified as the chief determinants of computer ownership, very few studies have systematically investigated whether race mattered. One reason is that it was taken for granted that computer ownership had not reached the high penetration levels that one identifies with television or VCRs, and so, implicitly, computers were still viewed as part of social experimentation and not a universalizing technology.

In recent years, however, the question regarding race has surfaced because of the growing use of computers in schools and also because it is no longer considered a technology sui generis. Its popularity and potential ubiquity have caused many to consider it as a revolutionary development with the potential to impact our society in fundamental ways. In terms of this specific result regarding income and education, then, the question immediately arises: what happens to the correlation between Internet use or computer ownership correlates and race if we hold income and education constant?

A second issue relates to how we should classify computer technology and into what category of existing technologies we can place it. For example, over the last quarter century much research has been conducted regarding individual's media habits. The dominant media of interest in the American context are electronic and print media. Electronic media consist of radio and TV and print media include newspapers and magazines. For most purposes, media are classified as entertainment oriented with TV and radio being viewed as more entertainment oriented followed by magazines and newspapers which are also considered to be information oriented media. Add to this list of media the telephone, the ubiquitous communication technology. The question that concerns us now is how to classify Internet and Internet-based technologies. Is it entertainment, or is it oriented more toward information, or is it communication? The general notion is that Internet represents all the three elements and therefore occupies a special place in our collective consciousness.

Previous research on the participation of African-Americans with regard to different media may be summarized as follows:

> African-Americans have the highest participation in radio and TV and the lowest participation in newspapers. In terms of our classification, it means that historically, they have participated in greater measure in entertainment oriented technologies rather than in information oriented technologies. Previous studies have also shown that African-American ownership of telephones is lower than white ownership, which may be due in part to differences in income.

Using past data on African-American media habits as the beginning point for the present study, what can we say about their participation in the new technological environment? We will begin with some crude generalizations and proceed to examine them with greater scrutiny.

To the extent that participation in computer technologies is determined by income and education we can hypothesize that African-Americans will be disadvantaged because they tend to have lower income and educational levels compared to whites. On the other hand, we can also state that within their racial grouping, African-Americans with higher incomes and education are more likely to use computers.

To the extent that computer technologies are closer to being information oriented rather than entertainment oriented, we might hypothesize that African-Americans are less likely to use them for information purposes and that their use of computer use would tend to be more entertainment oriented.

But the issues are clearly more complex. To say that African-Americans will demonstrate higher participation in the entertainment oriented aspects of Internet technologies may sound like we are engaging in racial stereotyping. Our position is that to the extent that prior research is reliable, it may certainly be true that African-Americans will demonstrate this tendency at least in the near term. A more in-depth

analysis of this question raises the following question. Why is it that African-Americans have traditionally participated in more entertainment oriented media and less in information oriented media? The reasons are cultural and ideological—cultural in the sense that African-Americans have so far found their social expression through various art forms, sports, and the like, and have been unable to gain entry into other dominant institutional domains such as education, technical employment and professional occupations. To say that African-Americans have gravitated toward more entertainment aspects of social life is not to advocate that this should be perpetuated.

A more micro reasoning is that for any household, the financial investment in television or radio is almost negligible. Once a television is purchased the programs are free unless one chooses to buy a cable service. On the other hand, newspapers and magazines do require subscriptions which can easily add up. For many African-American families whose financial standing is lower than the whites, subscriptions to magazines and newspapers my mean financial hardship. Another reason is that most newspapers and magazines represent the views of dominant culture and their is very little space for other views. There is thus a disincentive for ethnic minorities to read those outlets which are not representative of the wide spectrum of the population. Finally, in the past thirty years or so, African-Americans have made an impact on the national scene primarily via sports. The media that are devoted to sport activities are television and radio. This also explains why African-Americans use these media more than print. One can make similar arguments in terms of African-American music which finds greater expression on television and radio.

What does this all mean to our understanding of Internet-based technologies? One can say with some certainty that these technologies do represent the dominant culture in terms of the discourse they have generated. Secondly, these technologies have had great impact in the realms of professional work and education and less so on the domestic front. The cultural signification of these technologies is that they have arisen from the white, male culture. On the other hand, there is another side to these technologies that vitiates the argument of dominant culture. *Internet technology is a technology that democratizes and decentralizes more so than any other media currently available*. Internet technology cannot be controlled by dominant groups and does not lend itself to a natural monopoly status, in terms of content or presentation. Perhaps, this characteristic feature of Internet technology alone might bring out elements of social change not conceivable from conventional media. We therefore hypothesize that the use of the Internet by African-Americans will not follow the course of other media.

Finally, an important point regarding the social structure of African-Americans. Our whole approach to this racial group has assumed that African-Americans are a monolithic group. This is certainly not true and there is danger in continuing to treat them as such. In recent years, many African-Americans have moved to higher echelons of education and professional attainment. There are more African-American lawyers, doctors, educators, journalists, company executives and the like than ever before. More African-American women have entered the labor force in greater strength. In other words, with reference to our study, we should be prepared to find as many differences among

African-Americans as we expect to find between African-Americans and whites. However, this does not necessarily mean that educated, professional African-Americans will now behave like their white counterparts. They may develop their own norms of behavior appropriate to their history, and social and cultural milieu.

Objectives

To address the issues that we have raised, we undertake a comparative analysis of Internet and Web usage and access across racial/ethnic groups in the United States, with a major focus on differences between whites and African-Americans. The CommerceNet/Nielsen Internet Demographic Study (IDS), conducted in December 1996/January 1997, is the first nationally projectable survey of Internet usage to collect data on race and ethnicity. This permits us, for the first time, to obtain baseline estimates of differences in Internet and Web use among racial and ethnic groups in the United States. Future Nielsen IDS studies will also include race and ethnicity, permitting changes to be tracked over time. Recent studies (Find/SVP, CommerceNet/ Nielsen, Intelliquest) suggest that the gender gap in Web use is closing with time. While there is less conclusive evidence about the race gap, the perception is that the race gap is not closing (Abrams 1997). However, reliable survey-based answers to the question of the magnitude of race differences over time will not be available until subsequent waves of data collection are complete. For now, our objective is to establish clear baseline measures that document racial differences in Internet access and use, and the extent to which racial difference may themselves depend upon specific demographic variables.

This work is intended to stimulate discussion among scholars and policy makers interested in the issue of diversity on the Internet. For that reason, we have organized the draft according to specific analysis objectives. We have attempted to present the results in a manner that allows readers largely to draw their own conclusions. A subsequent working paper will be available shortly, and will emphasize the policy implications of these results.

This paper is organized as follows. In section two we begin by comparing the demographic composition of our sample with U.S. Census data for a comparable time period. Overall, we find that the CommerceNet/Nielsen IDS is representative of the U.S. population, although results for some minority groups (Asian-Americans and Native Americans) are based upon small sample sizes and are not projectable to the U.S. population. Next, in section three, we consider differences between all African-Americans and whites in the U.S. over age 16 on Internet and Web use. This is followed, in section four, by an identification of specific demographic variables which must be considered jointly with race in order to predict Internet and Web use. In section five, we consider differences between six different racial and ethnic groups on Internet and Web use, although due to small sample sizes and other potential biases, the results in this section must be considered preliminary. Section six briefly examines the issue of "Internet churn," or the extent to which Internet users "drop out" and become ex-Internet users. Section seven provides an in-depth comparison of African-Americans and whites,

which is restricted only to those respondents who have used the Web in the past six months. Finally, in section eight we summarize the major issues surrounding the minority use of the Internet and present a series of discussion points relevant to U.S. information infrastructure policy.

2. SAMPLE COMPOSITION

The CommerceNet/ Nielsen IDS is based upon an unrestricted random digit dial sampling frame, and used a computer assisted telephone interviewing system to obtain 6,487 completed interviews (Nielsen Media Research 1997). Eligible respondents were persons 16 years and older in the U.S. and Canada. In this paper, only the data from the 5,813 respondents in the United States were used. Weighted, these 5,813 respondents represent and allow projection to the total population of 199.9 million individuals in the Unites States aged 16 and over. Respondent weights in the IDS were adjusted by Nielsen so that marginal weighted distributions of Education, Gender, Race (African-American / non-African-American), Hispanic Origin, and Age were equivalent to Census estimates for the US and Canada. In this paper, a *weighted analysis* refers to one in which the Nielsen IDS respondent weights were applied, producing population projectable estimates.

Table 1 (see also Figure A1) compares the CommerceNet/Nielsen Internet Demographic Study (IDS), conducted in December 1996/January 1997, to March 1995 Census Current Population Survey (CPS) estimates for key demographic variables. The Nielsen IDS sample is representative of the US population. By comparing the weighted percentages from Nielsen IDS with corresponding weighted percentages from the Census CPS, we find that the distributions reported in Table 1 differ only slightly. These slight differences are because 1) Nielsen used more recent CPS data, and 2) the Nielsen adjustment combined US and Canada, while our analysis deals only with the U.S.

One point of departure is race, specifically the percentages for white and other categories. Note that the Census CPS reports more whites, while the Nielsen IDS reports more "other race." This appears to be because Hispanic respondents in the CPS were more likely to classify themselves as white, whereas Hispanic respondents in the IDS were more likely to classify themselves as "other."

Table 1: Marginal Distributions, Demographic Comparison of CommerceNet/Nielsen and 1995 (US Population Aged 16 and Older)

	CommerceNet/Nielsen raw count:	CommerceNet/Nielsen weighted %	1995 CPS weighted %
Age:			
16-24	909	15.4	16.3
25-34	1398	19.8	20.8
35-44	1270	21.4	21.3
45-54	901	16.7	15.4
55+	1335	26.6	26.1
Total	5813	100%	100%
Education:			
less than h.s.	659	21.9	21.9
high school	1723	32.0	32.3
some college	1641	25.4	25.6
college grad.	1136	13.1	13.7
post-graduate	654	7.6	6.5
Total	5813	100%	100%
Gender:			
male	2444	48.0	48.1
female	3369	52.0	51.9
Total	5813	100%	100%
Student status:			
full time	469	8.5	7.7
none/part time	5344	91.5	92.3
Total	5813	100%	100%
Race:			
White	4906	78.6	84.0
African-American	493	11.8	11.7
Asian	127	2.1	2.6
American Indian	75	1.6	0.5
Other	212	5.9	1.2
Total	5813	100%	100%
Ethnicity:			
Hispanic	319	9.9	9.3
non-Hispanic	5494	90.1	90.7
Total	5813	100%	100%

Table 2 (see also Figures A2a, A2b) presents the distribution of key demographic variables by race and Hispanic origin. Note that because the Nielsen IDS is adjusted so that the marginal percentages of African-Americans and non-African-Americans corresponds to Census results, it does not necessarily follow that race-specific demographic distributions for other racial ethnic groups (i.e., Asian-Americans, Hispanics, and Native Americans) from Nielsen IDS and Census CPS will be necessarily comparable. We see that:

- Distributions for whites are comparable.

- In the Nielsen IDS, African-Americans are both slightly overrepresented in the oldest and youngest age categories, in the lowest and highest education categories, and have somewhat more students and women than the Census CPS. However, the differences are not very large.

- Results for Asian-Americans are based upon only 127 respondents in Nielsen IDS, and exhibit substantial departures from Census CPS demographic distributions. Nielsen IDS Asian respondents were much more likely to be ages 16-24, male, and students (all groups which are more likely to use the Internet and Web). We expect a substantial upward bias in measures of Internet and Web access and use for the Asian respondents, and comparisons of Asians with other groups should statistically adjust for these demographic variables.

- Results for Native Americans are based upon only 75 respondents, but do not diverge substantially from Census CPS demographic distributions. There is some tendency for Nielsen IDS Native American respondents to be older, have less than a high school education, and be male.

- Because of the fact that the weighted Nielsen IDS contains 5.9% in the "other" Race category, and Census CPS contains only 1.2%, one cannot directly compare these two groups, since it is likely that the smaller Census CPS "other" group is a subset of the larger Nielsen IDS "other" group.

- There are some differences in demographic distributions for Census CPS and Nielsen IDS Hispanic respondents, with IDS Hispanic respondents more likely to be younger, more highly educated, and students than the CPS. We expect an upward bias in measures of Internet and Web access and use for the Hispanic respondents, and comparisons of Hispanics (as for Asians) with other groups should statistically adjust for these demographic variables. In section five, we provide such an adjustment. But, due to the large samples sizes for whites and African-Americans (and the demographic skew for Hispanic respondents in the Nielsen IDS), the majority of our analyses contrast whites and African-Americans.

Schement (1997) presents a detailed discussion of the overlap between Census race categories of white, African-American, Native American, and Asian-American and the ethnic categories of Hispanic/non-Hispanic. We attempted to form mutually exclusive

race/ethnic categories (e.g. Hispanic whites, non-Hispanic whites, Hispanic African-Americans, non-Hispanic African-Americans, etc.). But, due to discrepancies between the Nielsen IDS and Census CPS demographic distributions for Hispanics, we instead opted to treat race and Hispanic/non-Hispanic ethnicity as two separate and overlapping categorizations.

Table 2: Distributions Conditional on Race and Ethnicity, Demographic Comparison of CommerceNet/Nielsen and 1995 CPS (US Population 16 and Older)

	White		African-American		Asian		American Indian		Other		Hispanic[1]	
	CN[2]	CPS[3]	CN	CPS	CN	CPS	CN	CPS	CN	CPS	CN	CPS
Age:												
16-24	13.8	15.5	22.6	20.9	36.1	18.0	20.4	20.9	26.4	23.4	31.6	23.5
25-34	19.5	20.2	17.1	23.4	23.2	23.0	20.1	22.2	28.5	33.3	23.7	28.2
35-44	21.9	21.1	20.0	22.3	18.3	23.9	18.2	23.3	20.4	19.8	24.7	20.9
45-54	17.0	15.7	16.2	13.7	14.0	17.0	13.9	15.8	15.4	12.8	10.4	12.3
55+	28.8	27.5	24.2	19.8	8.4	18.1	27.4	18.2	9.3	10.7	9.5	15.3
total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Education:												
less than h.s.	18.6	20.4	35.9	30.2	18.8	19.6	40.2	32.2	34.3	45.8	36.7	48.9
high school	33.5	32.5	27.3	34.1	15.8	22.0	30.4	24.6	28.1	24.1	24.7	25.4
some college	26.4	25.9	20.3	24.6	25.7	25.4	19.3	24.6	24.0	18.5	26.2	18.2
college grad.	13.6	14.3	10.4	8.2	24.8	22.5	5.2	6.1	9.9	7.3	9.4	5.4
post-graduate	8.0	7.0	6.1	2.9	14.9	10.6	4.9	2.5	3.8	4.4	3.1	2.1
total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Gender:												
male	47.9	48.5	42.3	45.1	61.1	48.0	57.3	52.6	53.9	50.5	46.1	50.2
female	52.1	51.5	57.7	54.9	38.9	52.0	42.7	47.4	46.1	49.5	53.9	49.8
total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Student status:												
full time	6.9	7.3	12.8	9.4	25.8	11.3	7.6	8.8	14.6	9.6	19.4	8.2
none/part time	93.1	92.7	87.2	90.6	74.2	88.7	92.4	91.2	85.4	90.4	80.6	91.8
total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

[1] Hispanic is a separate question from race, and includes respondents who are members of each of the five racial groups.
[2] Weighted percentages from CommerceNet/Nielsen II Phone Survey, December 1996
[3] Weighted percentages from Current Population Survey, March 1995

3. OVERALL DIFFERENCES IN INTERNET AND WEB USE BETWEEN AFRICAN-AMERICANS AND WHITES

Demographic Differences Across Race/Access Segments

Three usage segments are compared in Table 3 (see also Figures A3a, A3b) - no Internet access, Internet access but no Web use (although possibly Internet use), and Web users. Figure A3a shows results for whites and Figure A3b for African-Americans. The major demographic differences in between whites and African-Americans occur for income, plans to purchase a computer, and age:

- The lowest income group (<$30K) differentiates usage segments much more for African-Americans than for whites. Of African-Americans with no Internet access, 74.5% have household incomes less than $30,000, compared with only 46.5% of whites with no Internet access. Thus, within African-Americans, the income-driven "digital divide" appears larger than for whites. This concern of an ever-widening gap between African-Americans has been identified by sociologists as a serious concern, which "will continue to grow as the black middle class moves forward and poor black Americans stagnate" (Beaupre and Brand-Williams 1997).

- There are differences in plans to purchase a computer between whites and African-Americans. For whites, Web users are the most likely to plan to purchase a computer in the next 6 months; for African-Americans, those with Internet access who are not Web users are the most likely to plan to purchase a computer.

- The youngest (16-24) age segment differentiates usage segments more for African-Americans than for whites.

Katz & Aspden (1997) reported evidence of what Lloyd Morrisett of the Markle Foundation has termed a "digital divide", with Internet users being generally wealthier and more highly educated. Sparrow and Vedantham (1995) summarize the broader information technology situation as follows:

> "Information technologies include basic telephone service, personal computing, and computer networking. Although these technologies are becoming everyday conveniences for many Americans, some communities are being left out. Disparities exist in levels of access between rich and poor and between suburban and inner-city residents." (p.19)

Figures A3a and A3b show evidence of a digital divide for both whites and African-Americans. Within both racial groups, "Web users" were most likely to be among the wealthiest individuals (those with incomes $60,000 and up, while and the "no Internet access segment" was the most likely to be composed of individuals with the lowest incomes (less than $30,000). The same holds true for Education. The "Web user" segment was most likely to consist of individuals who had completed college, while the

"no access" segment was most likely to be composed of those with a high school education or less.

Table 3 - Weighted Percentages of Demographics by Race and Web Access

	African American			White		
	no access (n=264)	access only (n=125)	Web user (n=104)	no access (n=2624)	access only (n=978)	Web user (n=1304)
Age:						
16-24 (age)	13.7	30.4	43.3	7.2	15.6	25.1
25-34	16.9	15.2	20.5	17.0	20.7	25.0
35-44	19.1	21.9	20.2	19.5	24.5	25.9
45-54	17.4	16.5	11.0	16.2	20.1	16.6
55+	33.0	16.0	4.9	40.1	19.2	7.4
total	100%	100%	100%	100%	100%	100%
Education:						
less than high school (education)	40.1	32.9	25.4	22.8	13.4	11.9
completed high school	32.6	23.2	14.3	40.8	30.3	17.0
some college	15.4	26.6	28.7	23.1	30.3	31.8
completed college	7.1	11.0	21.5	8.8	17.6	22.8
post graduate study or degree	4.9	6.3	10.1	4.6	8.4	16.5
total	100%	100%	100%	100%	100%	100%
Household Income:						
< $30K	74.5	53.1	20.1	44.5	25.2	16.7
$30K - $60K	19.3	29.2	39.1	38.7	41.6	39.6
$60K - 100K	5.6	10.5	23.0	13.1	23.4	29.7
> $100K	.6	7.3	16.9	3.8	9.8	14.1
total	100%	100%	100%	100%	100%	100%
Gender:						
male	40.1	37.3	57.4	43.9	44.9	60.8
female	59.9	62.7	42.6	56.1	55.1	39.2
total	100%	100%	100%	100%	100%	100%
% of column who...						
is a full time student?	6.4%	20.9%	24.0%	1.6%	10.1%	18.2%
owns a Computer?	15.1%	32.7%	73.7%	23.9%	62.0%	83.3%
plan to purchase PC in next 6 months?	17.9%	46.2%	32.6%	12.7%	19.3%	24.7%
is interested in Internet TV?	10.5%	18.1%	30.6%	7.0%	13.9%	22.9%

Race Differences on Key Indicators

Unadjusted results. Table 4 presents a series of significance tests[4] comparing whites and African-Americans on a series of 17 key indicators of Internet and Web use. Considering first the left third of Table 4 (see also Figure A4), which shows *unadjusted* weighted percentages. The overall results are that whites are more likely than African-Americans to have ever uses the Internet and Web, from any location, including home, work, school, other, and to have used the Web in the past 6 months. Whites are more likely to own a computer (44.2% vs. 29%), have PC access at work, and have a home fax.

Table 4: Weighted Percentages for Differences in Race, Unadjusted and Adjusted

	Unadjusted:			Adjusted for age, education, gender and student status:			Adjusted for household income, age, education, gender and student status:		
	% of whites (n=4906)	% of African-Americans (n=493)	p-value	% of whites (n=4906)	% of African-Americans (n=493)	p-value	% of whites (n=3960)	% of African-Americans (n=382)	p-value
Q1) Currently have access to Internet	39.7	38.8	n.s.	39.8	38.4	n.s.	40.8	43.7	n.s.
Q2) Ever used Internet (any location)	34.3	30.1	.0273	34.4	29.2	.0021	35.3	34.2	n.s.
Q2a) Ever used Internet (home)	18.3	11.1	.0001	18.2	11.5	.0001	18.8	13.6	.0023
Q2b) Ever used Internet (work)	15.4	10.7	.0011	15.1	12.4	.0488	16.7	17.5	n.s.
Q2c) Ever used Internet (school)	14.8	10.4	.0006	10.9	11.9	n.s.	10.4	11.2	n.s.
Q2d)Ever used Internet (other location)	11.0	9.2	n.s.	11.2	8.3	.0174	11.1	9.8	n.s.
Q9) Ever used Web (any location)	26.0	22.0	.0230	26.1	21.3	.0028	27.1	23.1	.0314
Q9a) Ever used Web (home)	14.7	9.0	.0001	14.6	9.3	.0001	15.4	11.5	.0145
Q9b) Ever used Web (work)	11.1	8.4	.0344	10.9	9.8	n.s.	12.1	12.2	n.s.
Q9c) Ever used Web (school)	10.9	7.2	.0006	7.5	8.9	n.s.	7.4	6.8	n.s.
Q9d) Ever used Web (other location)	7.3	5.3	n.s.	7.3	4.7	.0100	7.6	5.3	.0487
Q11) Used Web in the past 6 months	22.4	16.6	.0005	22.5	16.2	.0001	23.4	18.7	.0076
Q31) Own a Computer?	44.2	29.0	.0001	44.1	30.0	.0001	45.0	36.4	.0001
Q33) Plan purchase PC in 6 months?	16.7	27.2	.0001	16.8	26.2	.0001	17.5	31.2	.0001
Q34) Have PC access at work?	38.5	33.8	.0176	37.9	37.8	n.s.	41.1	44.9	n.s.
Q35d) Interested in Internet TV?	11.7	14.9	.0156	11.8	14.3	n.s.	12.8	15.8	n.s.
Q36) Have a home fax?	14.1	9.1	.0002	14.0	10.1	.0048	13.9	13.9	n.s.

[4] All statistical tests in this paper were performed with SAS GLM (SAS Institute 1992). This produces anti-conservative (inflated) tests of significance, since the sample was stratified with unequal selection probabilities. The significance tests will be rerun using SUDAAN (Research Triangle Institute 1997), a statistical analysis package for complex survey samples which have unequal selection probabilities. The results of the SUDAAN analysis were not available at the time of this draft. Significance tests reported in this paper should be viewed as preliminary, and the reader is urged not to over-interpret marginal (close to .05) significance levels.

Our estimate of 29% of African-American households with access to a personal computer compares with estimates provided by Simmons Market Research Bureau (*Interactive Marketing News* 1997), which reported that 23% of African-Americans owned a personal computer. The gap between whites and African-Americans in computer ownership has been cited as the key explanation for corresponding gaps in Internet and Web usage. A Yankelovich Monitor study (*Interactive Daily* 1997) "suggests that what bars entry to cyberspace among African Americans is owning a home PC, not lack of interest in the Internet."

A number of reasons have been provided in the popular press for the gap between whites and African-Americans in computer ownership. Price and value are often cited as explanations. For example, Malcolm CasSelle, co-founder of NetNoir, stated, "African-Americans just don't perceive the value of the Internet. Many blacks would pay $500 for a TV, and you could get a computer, though maybe not a top-of the line one, for not much more than that" (Holmes 1997). Similarly, Larry Irving, assistant secretary of Commerce, noted that WebTV is in the under-$500 price range, and "laptop and PC prices are coming down. As that continues to happen, the Internet will become more prevalent in the African-American community" (Holmes 1997).

In contrast to the fact that white Americans are more likely to currently own a personal computer, African-Americans are more likely to plan to purchase a PC in the next six months, and are more interested in purchasing a set-top box for access to the Internet over the television set. The relatively greater proportion of African-Americans who are interested in acquiring technology which is required to gain access to the Internet has been implicitly recognized by some marketers. *Ineractive Marketing News* (1997) reported that Barry Johnson, president of MSBET, a joint venture between Microsoft and Black Entertainment Television, Inc. "said there are two groups within the black community to be reached - those who have already accepted the medium and those who are most likely to come online."

The Internet directory service, www.everything.Black, implemented a campaign in early 1997 to attract one million African-Americans to their Web site in a one month period. This campaign, was motivated by skepticism about the numbers of African-American Web users:

> We have been met with strange looks and doubt whenever we asserted that there are plenty of Black people on the Internet, as many as a million. This skepticism comes from advertising executives, software manufacturers, hardware manufacturers, Internet Service Providers and media types - both Black and White individuals[5].

However, after a one month data period, only 60,000 unique African-American visitors were recorded. Anderson and Melchoir (1995) identified "unattractive markets for commercial investment" as one barrier to technology adoption within minority communities. Lack of knowledge of the number of African-Americans who have used

[5] http://www.everythingBlack.com/million.html

the Web, or underestimates of the number of African-Americans who have used the Web, provide a disincentive for commercial investment.

However, our results find 16.6% of African-Americans have used the Web in the past six months. This translates into 3.9 million African-American Web users, of which 1.36 million stated they used the Web in the past week. Thus, there is substantial support for the claim of at least one million active African-American Web users, and our figure of 3.9 million African-Americans who have used the Web in the past 6 months is considerably higher than estimates of one million African-Americans with Internet access that have been reported elsewhere (*New Media Week* 1997; *Interactive Marketing News* 1997). There are more African-Americans actively online than people think.

Adjusted results (age, education, gender, student status). Now consider the middle section of Table 4 (see also Figure A5), showing the weighted *adjusted* results. When we statistically adjust for age, education, gender and student status, and obtain least squares means[6] for the 17 indicators of Internet and Web use, we find that overall, differences between African-Americans and whites remain. Important differences in Net and Web usage between African-Americans and whites persist, and cannot be explained by differences in age, education, gender or student status. These include a greater proportion of whites reporting 1) having ever used the Internet or Web from any location, and specifically from home, work and nontraditional (other) locations; 2) having used the Web in the past six months; and 3) owning a home computer and home fax. African-Americans are more likely to report plans to purchase a computer in the next six months.

Adjusted results (income, age, education, gender, student status). One important demographic variable we have not adjusted for is household income. As is typical in sample surveys, there is a high proportion of non-response for household income (19.6%), which is why we treat this demographic variable separately. Now consider the right third of Table 4, which adjusts for household income, in addition to the other four demographic variables. The means become *higher* when we incorporate an adjustment for household income. This indicates that respondents who provided their income likely had higher incomes on average than did those who refused to answer the question (the subset of 81.4% of respondent who answered household income are more likely to be Internet and Web users).

While more differences between African-Americans and whites become non-significant, once we adjust for household income, we still find whites are more likely to report Internet/Web usage at home, usage of the Web from any location, usage of the Web from "other locations," and computer ownership, while African-Americans are more likely to report plans to purchase a computer in the next six months.

[6] Least-squares means were obtained using the OM option of SAS PROC GLM (SAS Institute 1992). The OM option weighting scheme for the computation of least squares means coefficients produces adjusted means which apply to a population whose margins correspond to those observed in the original data set.

4. DEMOGRAPHIC VARIABLES IMPACTING DIFFERENCES IN INTERNET AND WEB USE BETWEEN AFRICAN-AMERICANS AND WHITES

An *interaction* between a demographic variable and race means that the nature of race differences in an indicator variable of Internet/Web use varies according to levels of the demographic variable. Thus, an interaction between race and gender might mean that differences between African-Americans and whites were larger for men than they were for women. In such cases, we must *jointly* consider race and the corresponding demographic variable.

Table 5 shows which interactions of race and seven demographic variables are statistically significant. Demographics with the most significant differences are Student Status, Education, Age and Computer Professional. Subsequent figures and tables present the results.

Table 5: Summary of Significance Tests for Main Effects and Interactions of Race (Weighted Analysis)

	interactions from two-factor models						
	Race* Student	Race* Educ.	Race* Age	Race* Gender	Race* Kids	Race* Comp Prof	Race* PC Own
Q1) Currently have access to Internet	.0041	n.s.	n.s.	n.s.	n.s.	.0114	.0142
Q2) Ever used Internet (any location)	.0309	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Q2a) Ever used Internet (home)	.0001	.0446	n.s.	n.s.	.0343	.0471	n.s.
Q2b) Ever used Internet (work)	n.s.	n.s.	n.s.	n.s.	.n.s.	.0009	n.s.
Q2c) Ever used Internet (school)	.0008	n.s.	.0277	n.s.	n.s.	n.s.	n.s.
Q2d)Ever used Internet (other location)	.0001	.0127	.0024	n.s.	n.s.	n.s.	n.s.
Q9) Ever used Web (any location)	.0222	.0027	.0059	n.s.	n.s.	n.s.	n.s.
Q9a) Ever used Web (home)	.0004	n.s.	.0144	.0483	n.s.	n.s.	.0156
Q9b) Ever used Web (work)	n.s.	.0064	.0016	.0373	n.s.	.0007	n.s.
Q9c) Ever used Web (school)	n.s.	.0108	.0063	n.s.	n.s.	.0118	n.s.
Q9d) Ever used Web (other location)	.0001	n.s.	.0001	n.s.	n.s.	n.s.	n.s.
Q11) Used Web in the past 6 months	.0001	n.s.	n.s.	n.s.	n.s.	.0087	n.s.
Q31) Own a Computer?	.0001	n.s.	.0051	n.s.	n.s.	n.s.	n/a
Q33) Plan purchase PC next 6 months?	n.s.	n.s.	.0307	n.s.	n.s.	.0027	n.s.
Q34) Have PC access at work?	n.s.	.0015	n.s.	n.s.	n.s.	n.s.	n.s.
Q35d) Interested in Internet TV?	n.s.	n.s.	n.s.	n.s.	n.s.	.0020	n.s.
Q36) Have a home fax?	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

Student Status

The difference between whites and African-Americans is greater for students than non-students on most indicators of Internet and Web access and use, and also on computer ownership (Table 6, see also Figure A6). 83.5% of white students currently have access to the Internet, compared with only 64.7% of African-American students, while 36.5% of white nonstudents and 35.0% of African-American nonstudents have access. Similarly, 58.9% of white students have used the Web in the past 6 months, compared with only 31.1% of African-American students, while only 19.7% of white nonstudents and 14.5% of African-American nonstudents used the Web in the past 6 months.

Table 6: Weighted Percentages for Interactions of Race*Student

	Non-Students		Full-Time Students		
	% of Whites n=4750	% of African-Americans n=429	% of Whites n=336	% of African-Americans n=64	p-value[7]
Q1) Currently have access to Internet	36.5	35.0	83.5	64.7	.0041
Q2) Ever used Internet (any location)	31.0	25.5	79.0	61.0	.0309
Q2a) Ever used Internet (home)	16.7	10.6	40.0	14.4	.0001
Q2b) Ever used Internet (work)	15.5	12.0	13.1	2.0	n.s.
Q2c) Ever used Internet (school)	6.7	9.5	60.0	50.8	.0008
Q2d)Ever used Internet (other location)	9.5	8.5	31.2	14.2	.0001
Q9) Ever used Web (any location)	23.0	18.1	65.8	48.6	.0222
Q9a) Ever used Web (home)	13.3	8.4	33.3	13.0	.0004
Q9b) Ever used Web (work)	11.2	9.4	8.9	2.0	n.s.
Q9c) Ever used Web (school)	4.4	6.3	45.5	42.8	n.s.
Q9d) Ever used Web (other location)	6.0	5.4	23.5	4.2	.0001
Q11) Used Web in the past 6 months	19.7	14.5	58.9	31.1	.0001
Q31) Own a Computer?	42.1	28.6	73.0	31.9	.0001
Q33) Plan purchase PC next 6 months?	15.9	25.2	26.3	40.3	n.s.
Q34) Have PC access at work?	39.4	35.3	27.0	24.0	n.s.
Q35d) Interested in Internet TV?	10.9	13.9	23.5	21.4	n.s.
Q36) Have a home fax?	13.8	9.3	18.4	7.8	n.s.

What might explain the gap in Internet and Web access and use between African-American and white students? African-American and white students have similar levels of reported Internet use at school (50.8% vs. 60.0%) and Web use at school (42.8% vs. 45.5%). However, there is a large gap between African-American and white students on Internet use at home (14.4% vs. 40%) and Web use at home (13.0% vs. 33.3%). In addition, there is a gap between African-American and white students on Internet use at other locations such as libraries and friends (14.2% vs. 31.2%) and Web use at other locations (4.2% vs. 23.5%). Thus, it appears that the gap in overall access and use of the Internet and Web between African-American and white students is attributable to a relative lack of available of access to the Internet and Web outside of school for African-American students - especially to the lack of a home computer.

While sample sizes become very small for African-American students when segmented by whether they have a computer at home, Table 7 suggests that the gap in Web usage in the past 6 months between African-American and white students is greater for those who have no home computer (15.9% vs. 37.8%) than for students who have a home computer

(63.8% vs. 66.7%). The key items to look at as potential explanations are use of the Internet and Web from locations other than home, work, or school (again, locations such as libraries and friends homes). African-American students, both those with and without home computers, have less access to the Web and Internet in these "other locations" than white students. It appears that the presence of a computer in the home brings African-American and White students to rough parity in Internet and Web use. However, without a computer in the home, there is a gap between African-American and white students. Increasing access of African-American students to the Internet and Web from locations outside of home or school may reduce the gap for students who have no home computer.

Table 7: Weighted Percentage of Internet/Web Access and Use for Segments Defined by Student, Computer Ownership, and Race

	Non-Student				Student			
	% of No Home Computer		% of Home Computer		% of No Home Computer		% of Home Computer	
	White n= 2336	Black n=286	White n=2034	Black n=143	White n=89	Black n=42	White n=247	Black n=22
Q1) Currently have access to Internet	17.3	23.4	62.9	64.0	67.8	60.3	89.3	74.1
Q2) Ever used Internet (any location)	13.5	13.0	55.0	56.7	63.6	52.7	84.7	79.0
Q2a) Ever used Internet (home)	1.2	1.3	38.0	33.7	10.1	0	51.1	45.2
Q2b) Ever used Internet (work)	7.2	4.4	27.0	31.0	5.0	0	16.1	6.3
Q2c) Ever used Internet (school)	3.3	4.3	11.5	22.5	57.0	49.4	61.1	53.7
Q2d)Ever used Internet (other location)	5.8	6.7	14.7	13.0	30.7	11.3	31.4	20.4
Q9) Ever used Web (any location)	8.1	9.1	43.6	40.7	48.8	41.5	72.1	63.8
Q9a) Ever used Web (home)	.7	1.9	30.6	24.7	5.5	1.9	43.6	36.8
Q9b) Ever used Web (work)	4.4	5.0	20.7	20.2	1.9	0	11.4	6.3
Q9c) Ever used Web (school)	1.8	4.1	8.0	11.6	38.1	39.5	48.3	49.9
Q9d) Ever used Web (other location)	2.9	2.9	10.4	11.7	22.1	3.7	24.0	5.5
Q11) Used the Web in the past 6 months	6.1	4.8	38.5	38.7	37.8	15.9	66.7	63.8

Education

The six items shown in Table 8 exhibit significant interactions of race and education. African-Americans and whites with some college or less are roughly equal in Internet and Web use, with differences between the two groups emerging for those with a college degree or more. The differences are not completely consistent or as clear as the differences between students and nonstudents.

Table 8: Weighted Percentages for Significant Interactions of Race*Education

	less than h.s.		high school		some college		college		post graduate	
	White n=492	Black n=93	White n=1475	Black n=149	White n=1397	Black n=131	White n=971	Black n=82	White n=571	Black n=38
Q2a) Ever used Internet (home)	9.5	7.8	10.7	1.1	21.8	18.5	31.1	29.1	37.1	18.9
Q2d)Ever used Internet (other location)	11.6	5.2	6.5	10.6	12.0	7.5	16.7	17.3	15.9	18.4
Q9) Ever used Web (any location)	16.4	21.8	13.9	10.0	31.5	27.7	44.0	39.9	50.3	27.6
Q9b) Ever used Web (work)	2.4	5.3	4.6	3.0	11.6	9.0	22.2	24.1	37.9	22.1
Q9c) Ever used Web (school)	8.8	16.3	3.1	3.1	8.1	11.1	9.3	14.2	14.6	8.1
Q34) Have PC access at work?	11.9	10.0	30.4	27.7	47.2	49.6	61.4	84.0	66.6	63.4

Age

The nine items shown in Table 9 exhibit significant interactions of race and age. There are no differences in Internet/Web use between African-Americans and whites aged 55 and over. Interestingly, whites 55 and older are more likely to own a personal computer (25% vs. 10%), whereas African-Americans 55 and older are more likely to plan to purchase a personal computer in the next 6 months (20.7% vs. 8.2%). For this age category, increased penetration of computers in the home has not translated into greater use of the Internet/Web for whites than for African-Americans.

- Differences in computer ownership peaks at 42.4% for African-Americans in the 35-44 age group. The distribution for whites is bimodal, with 58.1% of those aged 18-24 and 55.8% of those aged 35-44 owning a computer.

- African-Americans and whites, while not differing in the 55 and older category, exhibit many differences in Internet and particularly Web usage in the other four age categories.

Table 9: Weighted Percentages for Significant Interactions of Race*Age

	18-24		25-34		35-44		45-54		55+	
	White n=662	Black n=123	White n=1148	Black n=117	White n=1091	Black n=108	White n=778	Black n=72	White n=1227	Black n=73
Q2c) Ever used Internet (school)	42.3	40.1	11.7	7.6	7.1	14.3	5.0	6.7	1.1	2.0
Q2d)Ever used Internet (other location)	26.9	18.1	15.4	5.1	9.5	5.5	8.3	10.7	3.8	5.3
Q9) Ever used Web (any location)	50.7	41.5	33.2	21.5	30.0	19.3	25.1	14.0	7.7	11.8
Q9a) Ever used Web (home)	24.6	12.6	19.0	11.7	18.4	12.2	14.9	3.1	4.4	5.0
Q9b) Ever used Web (work)	8.4	3.7	16.3	11.9	15.8	10.0	15.3	7.6	2.6	8.9
Q9c) Ever used Web (school)	29.6	33.5	8.1	2.8	5.6	5.2	2.4	1.9	.8	6.4
Q9d) Ever used Web (other location)	18.5	5.4	8.9	6.0	7.0	3.4	5.6	6.2	2.3	5.6
Q31) Own a Computer?	58.1	27.0	45.4	34.7	55.8	42.4	50.3	37.5	25.0	10.0
Q33) Plan purchase PC next 6 months?	25.6	38.7	19.5	18.3	20.5	30.4	16.0	26.1	8.2	20.7

Gender

Only the two items shown in Table 10 had significant interactions of Gender with Race. White men were more likely than African-American men to use the Web at home (19.3% vs. 10.9%) and at work (15.0% vs. 9.8%), but white women were only slightly more likely than African-American women to use the Web at home (10.4% vs. 7.6%) and were equally likely to use the Web at work (both 7.4%).

Table 10: Weighted Percentages for Significant Interactions of Race*Gender

	Men		Women	
	% of Whites n=2045	% of African-Americans n=193	% of Whites n=2861	% of African-Americans n=301
Q9a) Ever used Web (home)	19.3	10.9	10.4	7.6
Q9b) Ever used Web (work)	15.0	9.8	7.4	7.4

Children at Home

Only the one item in Table 11 had a significant interaction of race with the presence of children aged 17 and under living at home. For whites, the presence of children at home corresponded to higher usage of the Internet at home (22.8% vs. 15.3%). For African-Americans, presence of children did not correspond to higher usage of the Internet at home (11.6% vs. 10.6%).

Table 11: Weighted Percentages for Significant Interactions of Race*Kids At Home

	No Kids		Kids	
	% of Whites n=3067	% of African-Americans n=256	% of Whites n=1839	% of African-Americans n=237
Q2a) Ever used Internet (home)	15.3	10.6	22.8%	11.6

Computer Professional

Significant interactions were found the eight items in Table 12 (see also Figure A7) for the interaction of race by whether the respondent considered him or herself to be a Computer Professional. The differences may be summarized as relatively low but equal Internet and Web use for both white and African-American non-Computer Professionals, but greater Internet and Web use for white than African-American computer professionals.

A particularly interesting interaction is with whether the respondent's household plans to purchase a personal computer in the next six months. For whites, Computer Professionals are *more likely* to state they will purchase a computer (27.5% vs. 12.5%); for African-Americans, Computer Professionals are *less likely* to state they will purchase a computer (22.9% vs. 27.6%).

Table 12: Weighted Percentages for Significant Interactions of Race*Computer Professional

	Not a Computer Professional		Computer Professional	
	% of Whites n=4429	% of African-Americans n=438	% of Whites n=477	% of African-Americans n=55
Q1) Currently have access to Internet	37.0	37.2	72.3	55.0
Q2a) Ever used Internet (home)	16.1	9.5	44.6	27.4
Q2b) Ever used Internet (work)	12.6	9.0	47.9	27.9
Q9b) Ever used Web (work)	8.6	6.9	40.1	23.8
Q9c) Ever used Web (school)	6.6	9.4	14.2	26.6
Q11) Used Web in the past 6 months	19.7	14.9	54.6	34.6
Q33) Plan purchase PC next 6 months?	15.7	27.6	27.5	22.9
Q35d) Interested in Internet TV?	11.2	15.5	18.8	8.7

Computer Ownership

There are only two significant interactions of race with PC ownership, shown in Table 13. African-Americans who do not currently own a PC are more likely than whites to currently have access to the Internet (28% vs. 19%), while there is no difference in Net access between African-Americans and whites who do own a computer. This may be due to the greater proportion of African-American students in the sample, who have access through school.

The other significant interaction is that for those who own a PC, there is a slightly higher proportion of whites than African-Americans who have ever used the Web at home (32% vs. 26.4%).

Table 13: Weighted Percentages for Significant Interactions of Race*PC Ownership

	Do not own a Personal Computer		Own a Personal Computer	
	% of Whites n=2625	% of African-Americans n=328	% of Whites n=2281	% of African-Americans n=165
Q1) Currently have access to Internet	19.0	28.0	65.9	65.4
Q9a) Ever used Web (home)	.1	1.9	32.0	26.4

5. DIFFERENCES IN INTERNET AND WEB USE BY ALL RACIAL/ETHNIC GROUPS

Thus far, we have restricted attention to comparisons of whites and African-Americans. As noted, there are 1) differences in demographic distributions between the Nielsen IDS and Census CPS for Asians, Native Americans, and Hispanics, and 2) small samples sizes in the Nielsen IDS for Asians and Native Americans, that preclude directly comparing these groups to whites and African-Americans. In addition, the "other race" category, as noted, appears to be used differently be Nielsen IDS respondents than Census CPS respondents. One way to compare Asians, Native Americans, and Hispanics with whites and African-Americans would be to perform a post-stratification adjustment to develop new weights for these first three groups so that the Nielsen IDS demographic distributions matched the Census CPS distributions. However, this is not possible due to the small sample sizes for these groups in the Nielsen IDS.

As an alternative approach, least squares means were obtained for each demographic group that statistically adjust for differences in age, education, gender and student status. Adjusted means estimate the distributions of the race/ethnic groups under the assumption that distributions of age, education, gender and student status are identical in all groups. This of course, does not reflect reality, and so the adjusted means do not correspond to means from a real population. However, differences among adjusted means can be thought of a conservative estimate of racial/ethnic differences, in that these are racial differences that would still be present even after statistically adjusting for age, education, gender and student status.

Unadjusted means. The *unadjusted* percentages are shown in Table 14 using the Nielsen IDS weighted sample. Asians appear to be much higher than other groups on Internet and Web access and use. However, due to the skew toward 16-24 year olds, males, and students in the Asian sample, this is likely an overestimate. Unadjusted means for Hispanics are also relatively high, but again, we noted that Hispanics in the Nielsen IDS weighted sample were younger, more educated, and more likely to be students than the Census CPS. We recommend that no comparisons among Asians, Native Americans, and Hispanics be drawn using the unadjusted means in Table 14.

Adjusted means. Figure A8 presents the *adjusted* percentages by Race/Ethnic group. Native Americans have the highest adjusted mean, followed roughly by Asians, Whites, and then African-Americans and Hispanics. As there are only 75 Native Americans and 127 Asians in the sample, these results must be considered to be preliminary. However, there is evidence that these two minority groups are the most "wired" Americans, followed by whites, while African-Americans and Hispanics are the least.

Table 14: Unadjusted and Adjusted Differences in Weighted Percentages by Racial/Ethnic Groups

Item:	adjusted?[8]	White n=4906	African-American n=493	Asian n=127	Native American n=75	Other n=212	Hispanic n=319
Q1) Currently have access to Internet	no	39.7	38.8	61.8	38.6	43.5	44.9
	yes	40.4	38.8	41.6	43.1	41.0	38.1
Q2) Ever used Internet (any location)	no	34.3	30.1	62.2	46.9	34.5	38.6
	yes	35.2	29.8	40.5	50.5	30.1	33.4
Q2a) Ever used Internet (home)	no	18.3	11.1	31.7	31.4	10.5	10.8
	yes	18.1	11.4	20.5	33.5	15.3	9.3
Q2b) Ever used Internet (work)	no	15.3	10.7	25.0	18.8	15.7	13.8
	yes	15.1	12.6	17.6	21.7	16.7	13.6
Q2c) Ever used Internet (school)	no	10.4	14.8	31.6	21.6	20.5	23.2
	yes	11.7	12.5	16.9	22.2	13.3	15.1
Q2d) Ever used Internet (other)	no	11.0	9.2	15.3	18.2	11.2	11.0
	yes	11.3	8.5	7.5	18.4	11.4	7.5
Q9) Ever used Web (any location)	no	26.0	22.0	48.2	37.0	27.3	30.2
	yes	26.7	21.9	29.7	40.0	23.6	25.8
Q9a) Ever used Web (home)	no	14.7	9.0	25.1	22.9	8.8	9.3
	yes	14.6	9.4	15.4	24.5	11.7	8.4
Q9b) Ever used Web (work)	no	11.1	8.4	22.8	16.1	10.5	8.5
	yes	10.8	9.8	16.6	18.0	12.7	8.3
Q9c) Ever used Web (school)	no	7.2	10.9	25.0	13.3	12.7	15.3
	yes	8.1	9.4	14.0	14.0	8.2	10.0
Q9d) Ever used Web (other)	no	7.3	5.3	13.7	17.1	9.4	8.9
	yes	7.5	4.9	7.9	17.1	8.7	6.2
Q11 Used the Web in past 6 months	no	22.4	16.6	45.6	30.7	25.0	25.2
	yes	22.9	16.7	28.8	33.1	23.6	19.7
Q31) Own a Computer	no	44.2	29.0	61.3	44.1	32.8	40.1
	yes	44.5	30.5	49.7	49.7	30.3	43.3
Q33) Plan to purchase PC in the next 6 months	no	16.7	27.2	25.5	23.4	22.8	26.9
	yes	17.4	26.9	21.2	23.4	14.5	25.8
Q34) Have PC access at work?	no	38.5	33.8	44.0	38.4	35.4	33.8
	yes	37.9	37.8	32.8	44.5	37.2	34.6
Q35d) Interested in Internet TV?	no	11.7	14.9	11.3	18.2	16.4	16.3
	yes	12.1	14.7	6.7	18.3	13.4	13.5
Q36) Have a home fax?	no	14.1	9.1	27.3	24.4	9.0	14.3
	yes	14.3	10.4	22.8	26.3	4.5	19.2

[8] Adjusted for age, education, gender and student status. This provides estimates of percentages assuming the distributions of these four demographics are identical in each racial/ethnic group.

6) "INTERNET CHURN"

Internet "Churn" Rates.

One of the most surprising results found by Katz and Aspden (1997) was an estimated "churn rate" of about 50% for Internet usage. That is, 8% of their respondents reported being Internet users and 8% reported being former Internet users, for a total of 16% who have ever used the Internet. We found a total of 34.6% of the U.S. population aged 16 and over had ever used the Internet; however our study was conducted in December 1996 compared to October 1995 for Katz and Aspden. The first CommerceNet/Nielsen Internet Demographics study, fielded in August 1995, found 14.5% of the U.S. population personally had access to the Internet (Hoffman, Kalsbeek and Novak 1996), which is roughly in line with Katz and Aspden's figures.

The definition of a "churn rate" is dependent upon specifying a length of time of not using the Internet, after which an Internet user is considered to become a "former user." Katz and Aspden do not specify the time period they used to identify someone as a former user. However, by considering the time the respondent reported *last using the Internet,* we can estimate what proportion of those who have ever used the Internet are currently inactive. This provides a rough estimate of churn, defined as the proportion of people who once used the Internet, but who have not used it for a stated period of time.

Table 15 shows cumulative percentages of people who have *ever used the Internet, but who have not used the Internet for varying periods of time*. The percentages reported in Table 15 are cumulated from left to right, showing how the percentage of "former users" increases as the cut-off value for inactivity becomes more and more recent. Results are shown for all Internet users (bottom row) and also for specific race/ethnic groups.

Table 15 - Cumulative Percentage for When Last Used the Internet by Racial/Ethnic Groups (Base: Ever Used the Internet)

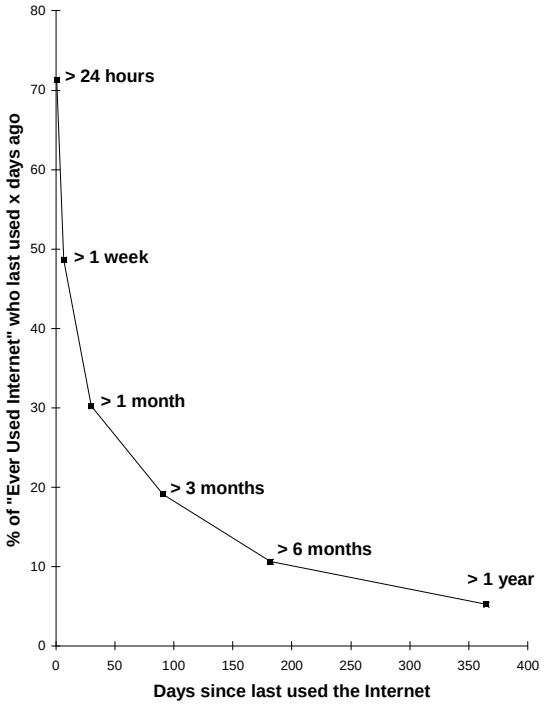
	Last Used the Internet:						
Racial/Ethnic Group:	> 1 year	> 6 months	>3 months	> 1 month	>1 week	> 24 hours	all
Asian Americans (n=82)	2.2	2.7	11.7	18.5	36.9	66.7	100%
whites (n=1888)	4.5	10.0	18.5	28.9	47.7	70.1	100%
other (n=86)	2.5	10.4	16.4	27.0	46.3	74.4	100%
Hispanic origin (n=132)	10.3	15.2	25.7	34.2	53.1	77.3	100%
African-Americans (n=170)	12.8	18.9	26.1	41.0	59.6	81.9	100%
Native Americans (n=32)	8.3	11.5	29.7	55.0	59.0	65.8	100%
All respondents who ever used the Internet (n=2257)	5.2	10.6	19.1	30.2	48.6	71.3	100%

For example, 5.2% respondent who have ever used the Internet have been inactive for over one year. When we consider those who have ever used the Internet but have been inactive for over six months, the percentage climbs to 10.6%. Note that the 10.6% is cumulative, in that it includes the previous 5.2%. Similarly, 19.1% have not used the

Internet for over three months, which includes the 10.6% who did not use the Internet for over six months. Continuing to the extreme, we find 71.3% of all people who have used the Internet have *not* used the Internet for more than 24 hours. Conversely, this means that 28.7% of all who have ever used the Internet *have* used it within the past 24 hours.

What is a reasonable period of time after which to consider someone has become a nonuser? We believe one month is a reasonable lower bound, and three months a reasonable upper bound. Table 15 shows that of all people who have ever used the Internet, 30.2% have not used the Internet for longer than one month, and 19.1% have not used the Internet for longer than three months. This suggests a churn, or drop-out rate of between 20% and 30% for all people who have ever used the Internet, depending upon how nonuser is defined. Note that in order to achieve a drop-out, or churn rate of 50%, we would need to consider an Internet user inactive if they have not used the Internet for one week or more. One week seems to us to be much too stringent of a cut off point, and Katz and Aspden's figure seems too high. Figure 1 below graphically displays the last row of Table 15.

Figure 1 - Estimated "Churn"



Of immediate interest in Table 15 is variability in drop-out times by racial/ethnic groups. African-Americans and Hispanics are the most likely to stop using the Internet (respectively, 41% and 34.2% of all who have ever used the Internet have been inactive for over one month); Asians and whites are the least likely (respectively 18.5% and 28.9% have been inactive for over one month). While Table 14 suggested Native Americans were relatively more likely to have used the Internet and Web, Table 15 shows that Native Americans are most likely to have been inactive for over one month (55%).

Table 16 provides a different perspective on Internet drop-out rates, showing the percentages who have been inactive for different lengths of time by when they started to use the Internet. We can see a definite relationship of time since last use of the Internet to time the respondent started using the Internet, with a gap between those who started using the Internet in the past year (50.8 to 61.3% last used the Internet over a week ago) and those who started using the Internet one year ago or earlier (only 30.3% to 38% last used the Internet over a week ago).

Table 16 - Cumulative Percentage for When Last Used the Internet by When Started to Use the Internet (Base: Ever Used the Internet)

	Last Used the Internet:						
Started to use the Internet:	> 1 year	> 6 months	>3 months	> 1 month	>1 week	> 24 hours	all
past 3 months (n=373)	-	-	-	18.6	50.8	79.1	100%
past 6 months (n=359)	-	-	23.9	38.0	61.3	81.5	100%
past year (n=602)	-	18.9	28.2	38.0	55.0	78.8	100%
1-2 years ago (n=429)	10.6	14.5	20.0	28.9	35.8	58.2	100%
2-3 years ago (n=262)	8.9	10.7	14.2	19.4	30.3	54.5	100%
3 or more years ago (n=232)	17.4	20.2	26.3	31.1	38.0	49.4	100%

7. DIFFERENCES IN INTERNET AND WEB USAGE FOR AFRICAN-AMERICAN AND WHITE WEB USERS

Demographics

In this last series of analyses, we turn our attention to the subsample of 1408 whites and African-Americans who are Web users (defined as having stated that they used the Web in the past 6 months). Demographic differences between African-Americans and whites are discussed first (Table 17c, also see Figure A9). To summarize:

- African-American Web users are much more likely to be in the "less than high school education" segment (25.4% vs. 11.9%).
- African-American Web users are more likely to be aged 16-24 (43.3% vs. 25.1%).
- African-American Web users are somewhat more likely to have children 17 or under living in the household (58.5% vs. 48.2%).
- Although the difference is not statistically significant, African-American Web users are somewhat more likely to be full time students (24% vs.18.1%)
- Differences in household income and gender are *not significantly different* between African-American and white Web users.

Internet Use

On a set of items dealing with Internet use (Table 17a, see also Figure A10), there are a number of differences between African-American and white Web users. African-American Web users are more likely to have started using the Internet recently, in the past 6 months (44.2% vs. 32%), while white Web users are more likely to have used the Internet during the past 24 hours (41.2% vs. 30.9%). In addition, type of access differs, with African-Americans more likely to have their home Internet access provided by only an online service (71.7% vs. 54.6%).

Katz and Aspden (1997) reported 43% of respondents found sending and receiving e-mail to be a very important reason for using the Internet. We found 37% of Web users reporting they used e-mail "frequently", with no differences between whites and African-Americans. In a list of 6 types of Internet activities (including telnet, news, email, agents, chat and downloads), e-mail was by far the most frequently mentioned. The only significant difference was for telnet, with African-Americans Web users more likely to use the Internet to connect to other computers.

Web Use

There are a number of differences on general Web use (Table 17a, see also Figure A11). White Web users are more likely to have ever used the Web at home or work, while African-American Web users are more likely to have ever used the Web at school.

Similar to Internet usage, African-Americans started used the Web more recently than white Web users, with 62% of African-American users vs. 43% of white users starting to use the Web in the past six months. Also similar to Internet usage, white users were more likely to have used the Web during the past 24 hours (29.7% vs. 15.9%). Differences in reported frequency of use were not statistically significant, although white Web users were slightly more likely to use the Web more frequently.

Katz and Aspden (1997) found that Internet users ranked business opportunities as a relatively unimportant reason for Internet users, but a very important reason for non-users. This was phrased, however, in terms of "making money." We found that in practice, 35.4% of white Web users, compared with only 23.1% of African-American Web users (Table 17c). stated they had ever used the Web for business purposes, but our question was more broadly stated and included purchasing products, selling products, customer support, and gathering information about products and competitors.

Web Usage Situations

In terms of usage time and occasion (Tables 17a and 17b, see also Figure A12), African-Americans are more likely to use the Web most frequently between noon and 6 pm (school and work use?), while whites are more likely to use the Web most frequently between 9pm and midnight (home use?).

Most frequently used location (home, work or school) parallels the "ever used" question, but differences are more dramatic. Katz and Aspden (1997) found that for Internet users, socio-personal development (including communicating with other people, gathering information, and curiosity) was rated as more important of a reason for Internet use than work-related or educational reasons. We found similar results for white Web users, but not for African-American Web users (Table 17b, Figure A12). Whites are more likely to state they use the Web most frequently at home (45.6% vs. 29.2%) and for personal use (55.9% vs. 37.9%); African-Americans are more likely to state they use the Web most frequently at school (27.8% vs. 12.8%) and for academic use (34.6% vs. 19.5%). Note that 24% of African-American and 18.1% of white Web users stated they were full time students, so the reported academic use by African-Americans is proportionately greater than the percentage of full time students (we do not have data on part time student status).

Web Applications

Considering Web applications (Table 17b, see also Figure A13), white Web users are more likely to report finding Web sites using directories or search engines (49% vs. 29.9%). Relatedly, white Web users report being somewhat more likely to use the Web to browse online. While the difference is not statistically significant, more African-American Web users report finding Web sites from friends or relatives (13.8% vs. 10.0%.

African-American Web users report using multimedia Web applications slightly more frequently than white Web users. African-Americans are slightly more likely to state they frequently use the Web to 1) perform audio/video conferencing (5.8% vs. 1.5%), 2) run Java applications (10.6% vs. 2.5%), and 3) receive audio/video (9.9% vs. 3.4%). While this may be a tenuous connection, we note that Schement (1997) reported that African-Americans cable households are more likely to subscribe to premium cable and order pay-per-view on cable. African-American households also more often report playing video games and recording television programs with a VCR, and are more likely to purchase products from Home Shopping Channel and TV infomercials, and are slightly more likely to use electronic bill paying.

Web Shopping

Last, we consider a series of Web shopping items (Table 17a, 17b; see also Figure A14). African-American and whites Web users do not differ as to:

- Having ever used the Web to purchase a product or service online.

- Using the Web to search for product/service or company information.
- Their stated likelihood of purchasing using the Web in the future.

- Whether they are not at all likely to buy on the Web because it is easier to buy in stores.

- Concerns about 1) safety of credit cards on the Web, 2) legitimacy of Web companies, 3) whether Web firms will sell their name, and 4) whether the product they would get from the Web is exactly what they ordered.

The only significant differences among Web users occur on search items, two of which are not directly related to Web shopping:

- Whites are more likely to use the Web to search for other (non-product/non-company) information (74.3% vs. 60.9%).

- Whites are more likely to use the Web to see what's new at their favorite Web sites (67.4% vs. 51.2%).

- Whites are more likely to use the Web to search for product information before purchase (56.3% vs. 37.3%)

One potential explanation of differences in search behavior is that since African-Americans have started to use the Web more recently than whites, they have not had as much time to develop search skills.

Table 17a: Weighted Percentages for African American and White Web Users

	% of African Americans n=104	% of whites n=1304	p-value
Q3a) Started using the Internet in the past 6 months	44.2	32.0	.028*
Started using the Internet 6 months to 2 years ago	42.1	44.3	
Started using the Internet 2 years ago or more	13.7	23.8	
Q3b) Last used Internet during past 24 hours	30.9	41.2	.001*
Last used Internet during past week	26.7	27.8	
Last used Internet during past month	14.6	16.9	
Last used Internet during past 1-6 months	27.8	14.1	
Q4a) Home Internet access through ISP	25.3	33.3	.016
Home Internet access through online service	71.7	54.6	
Home Internet access through ISP & online	3.0	12.1	
Q7f) How often do you telnet - never	49.2	58.4	.001*
How often do you telnet - middle three categories	34.3	31.8	
How often do you telnet - frequently	16.5	9.8	
Q9a) Ever used Web at home?	46.4	61.4	.001
Q9b) Ever used Web at work?	36.7	44.2	.045
Q9c) Ever used Web at school?	44.4	28.4	.001
Q9d) Ever used Web somewhere else?	24.4	26.3	n.s.
Q10) Started using Web in the past 6 months	62.0	43.0	.001*
Started using Web 6 months to 2 years ago	31.2	40.8	
Started using Web 2 years ago or more	6.8	16.2	
Q11) Last used Web during past 24 hours	15.9	29.7	.001*
Last used Web during past week	18.9	27.9	
Last used Web during past month	23.8	22.0	
Last used Web during past 1-6 months	41.4	20.5	
Q15C) Use the Web at least once a day	15.3	18.5	n.s. (.124)
Use the Web at least once a week	32.9	38.3	
Use the Web at least once a month	24.6	24.1	
Use the Web less than once a month	27.1	19.1	
Q15D) Use Web most frequently 6 am - noon	20.5	17.9	.005
Use Web most frequently noon - 6 pm	41.6	32.5	
Use Web most frequently 6-9 pm	30.0	33.3	
Use Web most frequently 9 pm - midnight	4.6	14.7	
Use Web most frequently midnight - 6 am	3.3	1.6	
Q15E) Use the Web most frequently at home	29.2	45.6	.001
Use the Web most frequently at work	29.6	28.9	
Use the Web most frequently at school	27.8	12.8	
Use the Web most frequently somewhere else	13.5	12.7	

Table 17b: Weighted Percentages for African American and White Web Users

	% of African Americans n=104	% of whites n=1304	p-value
Q15F) Use the Web most for personal use	37.9	55.9	.001
Use the Web most for work	25.9	23.8	
Use the Web most for academic use	34.6	19.5	
Use the Web most for some other use	1.6	.8	
Q16_1) Find Web sites using directories/search engines	29.9	49.0	.001
Q16_2) Find Web sites from friends/relatives	13.8	10.0	n.s. (.155)
Q16A) Use Web audio/video conferencing - never	72.0	82.5	.001*
Use Web a/v conferencing - middle 3 categories	22.3	16.0	
Use Web audio/video conferencing - frequently	5.8	1.5	
Q16B) Use Web to run Java applications - never	74.5	74.7	.001*
Use Web to run Java apps - middle 3 categories	14.9	22.8	
Use Web to run Java apps - frequently	10.6	2.5	
Q16E) Use Web to receive audio/video - never	62.6	57.2	.001*
Use Web to receive audio/video - middle 3 categories	27.4	39.3	
Use Web to receive audio/video - frequently	9.9	3.4	
Q16G) Use Web to browse online - never	26.2	15.1	.01*
Use Web to browse online - middle 3 categories	54.4	60.6	
Use Web to browse online - frequently	19.5	24.3	
Q17A) Use Web to search for product/service information	75.1	74.6	n.s. (.890)
Q17B) Use Web to search for company/org. Information	66.0	72.0	n.s. (.130)
Q17C) Use Web to search for other information	60.9	74.3	.001
Q17D) Use Web to see what's new at favorite sites	51.2	67.4	.001
Q17E) Used Web to search for product info before purchase	37.3	56.3	.001 (a)
Q17K) Ever used Web to purchase product/service online	11.8	16.1	n.s. (.182)
Q18) Purchase using Web in future - not at all likely	40.0	32.6	n.s. (.176)*
Purchase using Web in future - middle 3 categories	48.8	52.1	
Purchase using Web in future - very likely	11.2	15.4	
Q18A_4) Not at all likely to buy due to security	13.8	34.3	.002 (a)
Q18A_11) Not at all likely to buy because easier in stores	17.1	18.2	n.s. (a)
Q18C) Safe to give credit card over Web - strongly disagree	71.9	63.9	n.s. (.056)
Safe to give credit card over Web - mid 3 categories	26.1	33.2	
Safe to give credit card over Web - strongly agree	2.0	2.90	
Q18D) Sure a Web company is legitimate - strongly disagree	42.2	36.0	.043
Sure a Web company is legitimate - mid 3 categories	50.6	58.3	
Sure a Web company is legitimate - strongly agree	7.2	5.7	
Q18E) Sure Web firm won't sell my name - strongly disagree	58.4	59.6	n.s. (.102)
Sure Web firm won't sell my name - mid 3 categories	32.4	36.1	
Sure Web firm won't sell my name - strongly agree	9.2	4.3	

Table 17c: Weighted Percentages for African American and White Web Users

	% of African Americans n=104	% of whites n=1304	p-value
Q18F) Sure will get exactly what I ordered - strongly agree	25.7	17.5	n.s. (.185)
Sure will get exactly what I ordered - mid 3 categories	64.7	71.8	
Sure will get exactly what I ordered - strongly agree	9.6	10.6	
Q19A) Ever used Web for business purposes	23.1	35.4	.004
Q32) Number of computers owned - none	26.3	17.8	.002
Number of computers owned - one	52.8	47.6	
Number of computers owned - two or more	20.9	34.7	
Q33) Plan to purchase PC in next 6 months?	32.6	24.7	.043
Q38) less than high school (education)	25.4	11.9	.001
completed high school	14.3	17.0	
some college	28.7	31.8	
completed college	21.5	22.8	
post graduate study or degree	10.1	16.5	
Q39) 16-24 (age)	43.3	25.1	.001
25-34	20.5	25.0	
35-44	20.2	25.9	
45-54	11.0	16.6	
55+	4.9	7.4	
Q40) children ages 17 or under in household?	58.5	48.2	.022
Q40A1) children under 6 years old in HH?	24.5	16.8	.024
Q40A2) children 6-11 years old in HH?	21.5	19.6	n.s. (.578)
Q40A3) children 12-17 years old in HH?	30.1	26.1	n.s. (.306)
Q41) Full time student	24.0	18.1	n.s. (.090)
Q41B) Do you consider self a computer professional?	18.4	18.9	n.s. (.898)
Q42) Annual HH income < $30K	21.0	16.7	n.s. (.395
Annual HH income $30-60K	39.1	39.6	
Annual HH income $60-100K	23.0	29.7	
Annual HH income >$100K	16.9	14.1	
Q45) male	57.4	60.8	n.s. (.434)
female	42.6	39.2	

*****p-value shown for full crosstabulation - only selected cells are shown here and/or cells shown were collapsed

(a) base is smaller due to skip patterns (need to report sizes)

DISCUSSION POINTS

Based upon the results we have presented, we raise a series of points for further discussion:

1) ***Home Web use.*** While inequalities in Internet access in schools persist (Educational Testing Service 1997), our results suggest that inequalities in Internet access at home may be even more problematic. The role of Internet home access needs to be clearly understood (Abrams 1997). There is a large gap in Web home use and general Web access between African-American and white students that appears to be driven by the presence of the computer in the home. Katz and Aspden (1997) investigated the role of social and work networks in introducing people to the Internet. The dominant three ways people were originally introduced to the Internet were 1) taught by friends or family, 2) learned at work, and 3) self taught. Formal coursework was the *least* often mentioned way people were introduced to the Internet. Long term Internet users were most likely to have learned at work; for recent Internet users, friends/family and self-taught were equally important. These results reinforce the importance of the presence of a computer at home, or the opportunity to access the Web from locations other than the home, in stimulating Web use.

   Insight into the importance of reducing this gap in home Web use between whites and African-Americans is provided by Anderson and Melchior's (1995) discussion of *information redlining*. Information redlining signifies the relegation of minorities into situations where satisfying their information needs is weighed against their economic and social worth. From the minority point of view, this is both an access issue and a form of discrimination. The new technologies of information are not simply tools of private communication as a telephone is, or tools of entertainment as a television is. They provide direct access to information sources which are essential in making social choices and keeping track of developments not only in the world at large but within the immediate neighborhoods. Unless the neighborhoods are properly served, there is no way out of information redlining for most of these disadvantaged groups.

2) ***Web use outside of the home, school and workplace.*** In addition to the gap in home usage, the implications of differential Internet access outside of home, school and the workplace needs to be clearly understood. Corresponding to the gap between African-American and white students in Internet and Web use in the home is an additional gap in Internet and Web use in locations outside of home, work, or school. Unlike the home usage gap, this gap between white and African-American students is present regardless of whether a student has a computer at home. While the gap is of obvious concern for African-American students who have no home computer, it is of concern for African-American students who have a home computer, to the extent that social networks are important in stimulating Web usage. Public-private initiatives such as Bell Atlantic's efforts in Union City and Bill Gates announcement of a $200 million gift to provide library access to the Internet are a step in the right direction

(Abrams 1997), and it has been noted that "community networks and public access terminals offer great potential for African-American communities" (Sheppard 1997).

3) ***School Web use.*** The role of Web access in the school, compared to other locations, needs to be clearly understood. In terms of the most basic indicator of usage, whether a full time student has ever used the Web at school, there are no differences between Whites and African-Americans. However, as a recent report by the Educational Testing Service (1997) makes clear:

    - There are major differences among schools in their access to different kinds of educational technology.
    - Students attending poor and high-minority schools have less access to most types of technology than students attending other schools.
    - It will cost about $15 billion, approximately $300 per student to make all our schools "technology rich." This is five times what we currently spend on technology, but only 5% of total education spending.

    Anderson and Melchior (1995) cited lack of proper education as an important barrier to technology access and adoption. Access to technology does not make much sense unless people are properly educated in using the technologies. While our data suggest whites and African-Americans have similar levels of access to the Internet and Web in schools, our data do not speak to the quality of the hardware/network connections, or the quality of information technology education that is provided by the schools. As noted by the ETS report, creation of educational opportunities requires financial commitment which cannot be generated by the minority groups from within their resources.

4) ***Differences in search behavior.*** Reasons for the gap between African-Americans and whites in Web search behavior need to be clearly understood. Although both African-American and white Web users report relatively the same extent of searching for product or service related information, white Web users are more likely to report searching for non-product and non-corporate information, and to find Web sites using directories and search engines. One possibility is that despite a range of sites such as NetNoir[9], the African-American Financial Index[10] (Castaneda 1997), and Black Entertainment Television[11], general purpose search agents may not be perceived as an effective way to locate Web content that is compelling to African-American users. This suggests the development of search engines targeted to the interests of racial/ethnic groups. Alternatively, as we have previously noted, the difference in search behavior may be explained by the fact that African-Americans have started using the Web more recently, and have not has as much time to develop search skills.

[9] http://www.netnoir.com/
[10] http://nestegg.iddis.com/aaindex/dex.html
[11] http://www.betnetworks.com/newhome.html

5) ***Multicultural content.*** Studies investigating the extent of multicultural content on the Web are needed. Another possibility for the gap between African-Americans and whites in Web search behavior is that there is insufficient content of interest to African-Americans. *Interactive Marketing News* (1997) claimed that "while there are about 10 million sites on the Web, there are fewer than 500 sites targeted" to African-Americans. However, others have commented on the multicultural diversity of the Web. Skriloff (1997) reported, "there are thousands of Web sites with content to appeal to Hispanics, African-Americans, Asian-Americans, and other ethnic groups...A Web search for Latino sites, reported in the Feb./March issue of Latina Magazine, turned up 36,000. Many of these sites are ready-for-prime time with high quality content, graphics, and strategic purpose."

6) ***Internet Churn.*** Our analysis of "Internet Churn" found that African Americans and Hispanics are much more likely than whites or Asian-Americans to stop using the Internet. Additionally, African-American Web users are the least likely to have used the Web in the past 24 hours (only 19.1% compared to 29.9% of whites). Given the rough parity of white and African-American Web users' incomes, it does not appear that economic issues are driving the higher drop-out rate for African-Americans, although additional research is recommended on this point. As noted above, systematic study of the extent of multicultural content on the Web is needed, and may provide an explanation of why African-Americans are less likely to be recent Web users.

   An alternative explanatory factor is differences between racial/ethnic groups in media use. In order to understand African-Americans' use of media, Lee and Browne (1995) conducted a study of media use by African-Americans and whites and found that African Americans' use of the traditional electronic media (television and Radio) was much higher than their use of print media (Newspapers and magazines). The results were opposite for the white population. The same results were reported in an earlier study conducted by Bogart (1972) more than twenty years ago. In the same vein, Durand, Teele and Bearden (1979) reported that African-Americans consider television the most credible advertising medium whereas whites consider magazines the most credible. Both races seem to have different media-socialization and media-gratification behaviors that result not merely from differences in the social standings of the two groups, but from differences between African-American and white cultures (Atkin, Greenberg and McDermott 1983).

   One can argue from these results that an important question is whether there are perceptual differences between African-Americans and whites in whether the Internet/Web (an electronic media) is closer to television and radio, or whether it is closer to the print medium. As noted by Hoffman and Novak (1996), the Web represents a combination of the elements of print, broadcast, and inter-personal media. However, African-Americans and whites may differ according to which of these elements are most critical, and in terms of their perceptions of the appropriateness of the Web as a alternative to traditional print, broadcast, and inter-personal media. Possibly, African-Americans may be more dissatisfied with the Web

from a uses and gratifications perspective, which may contribute to a higher churn rate.

7) ***Comparisons of all racial/ethnic groups.*** Comparisons of additional minority groups, in particular, Asian-Americans, Hispanics, and Native Americans, are preliminary in this paper. Subsequent studies need to oversample members of minority groups so that there are sufficient numbers of all minority groups to perform post-stratification adjustments to create weights that yield population-projectable results for each minority group.

8) ***Shopping behavior.*** We found no differences between African-Americans and whites in Web shopping items. Is this because race doesn't matter for "lead users?" who are most likely to shop, or is this because commercial Web content better targets racial and ethnic groups than does non-commercial Web content?

9) ***Community building.*** Are there different cultural identities for different parts of cyberspace? Schement (1997) notes that by the year 2020, major U.S. cities such as Los Angeles, Chicago, and New York will have increasingly divergent ethnic profiles, and will take on distinctive cultural identities. An important question is whether there are divergent ethnic profiles for areas of cyberspace. While the questions in the Nielsen IDS do not allow us to directly address this issue, Table 17, which contrasts white and African-American Web users, provides some preliminary evidence of divergent ethnic profiles for various Web usage situations. Whites report being more likely to be long term users, and to use the Web more frequently, for personal use and at home, during evening hours, for search purposes, and for business purposes. African-Americans are more recent users, use the Web less frequently, use the Web for school or academic purposes, during daytime hours, for multimedia applications, and to have Internet access through an online service.

   In addition to facilitating community building at the global level, the Web also facilitates neighborhood-level community building. Schwartz (1996) discusses how the Internet can be used as a vehicle for empowering communities. Anderson and Melchior (1995) raise the issue of the ways in which telecommunications can be used to strengthen communities. Thus, we should expect to find neighborhood Web sites emerging as an important aspect of cyberspace, and that these Web sites will parallel the ethnic profiles of the corresponding physical communities.

In summary, we have presented a comprehensive analysis of the relationship of race to Internet access and usage. Again, our objective is to stimulate an informed discussion among scholars and policy makers interested in the issue of diversity on the Internet.

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APPENDIX - FIGURES

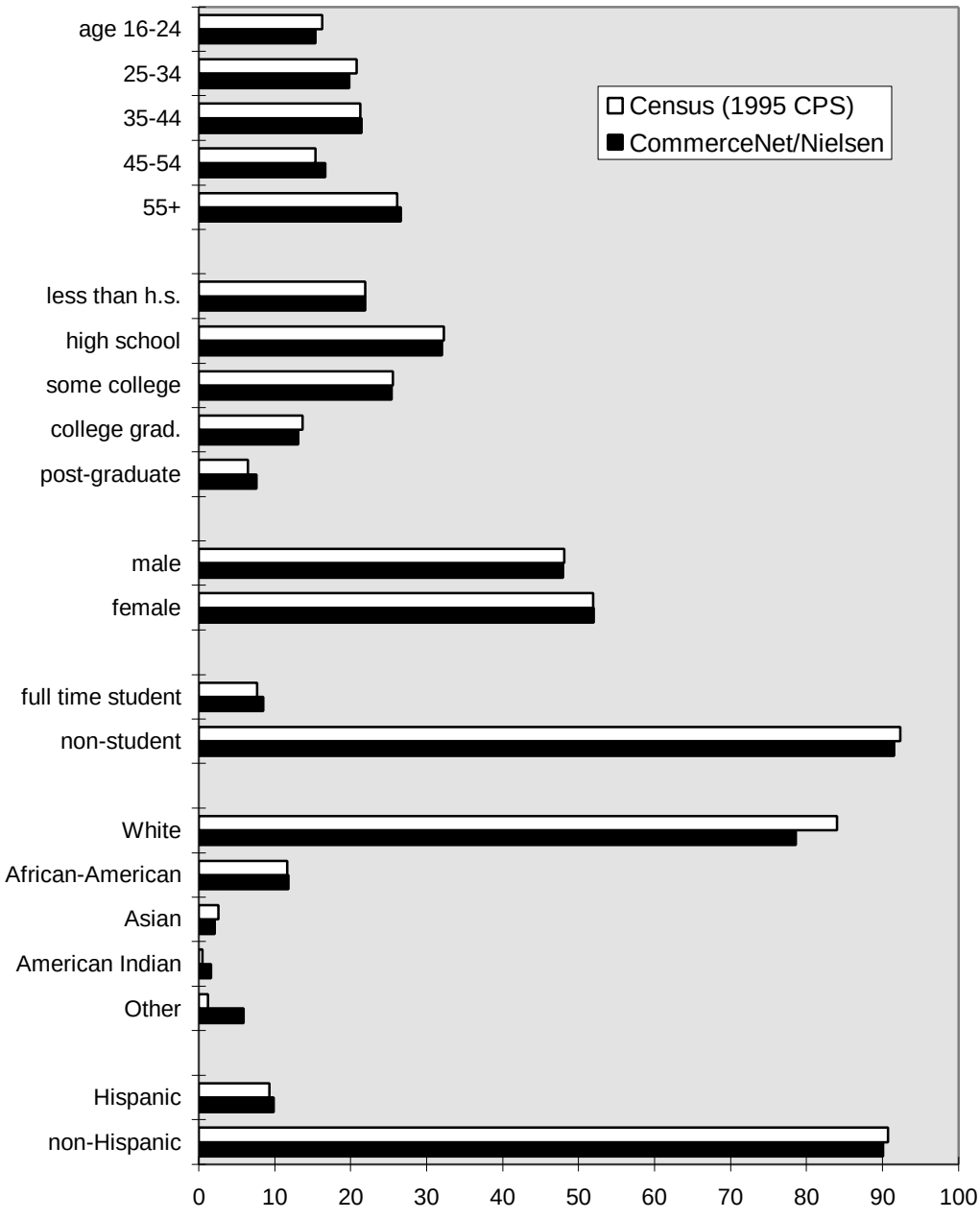

Figure A1: Marginal Distributions, Demographic Comparison of CommerceNet/ Nielsen and 1995 Census CPS (US Population Aged 16 and Older)

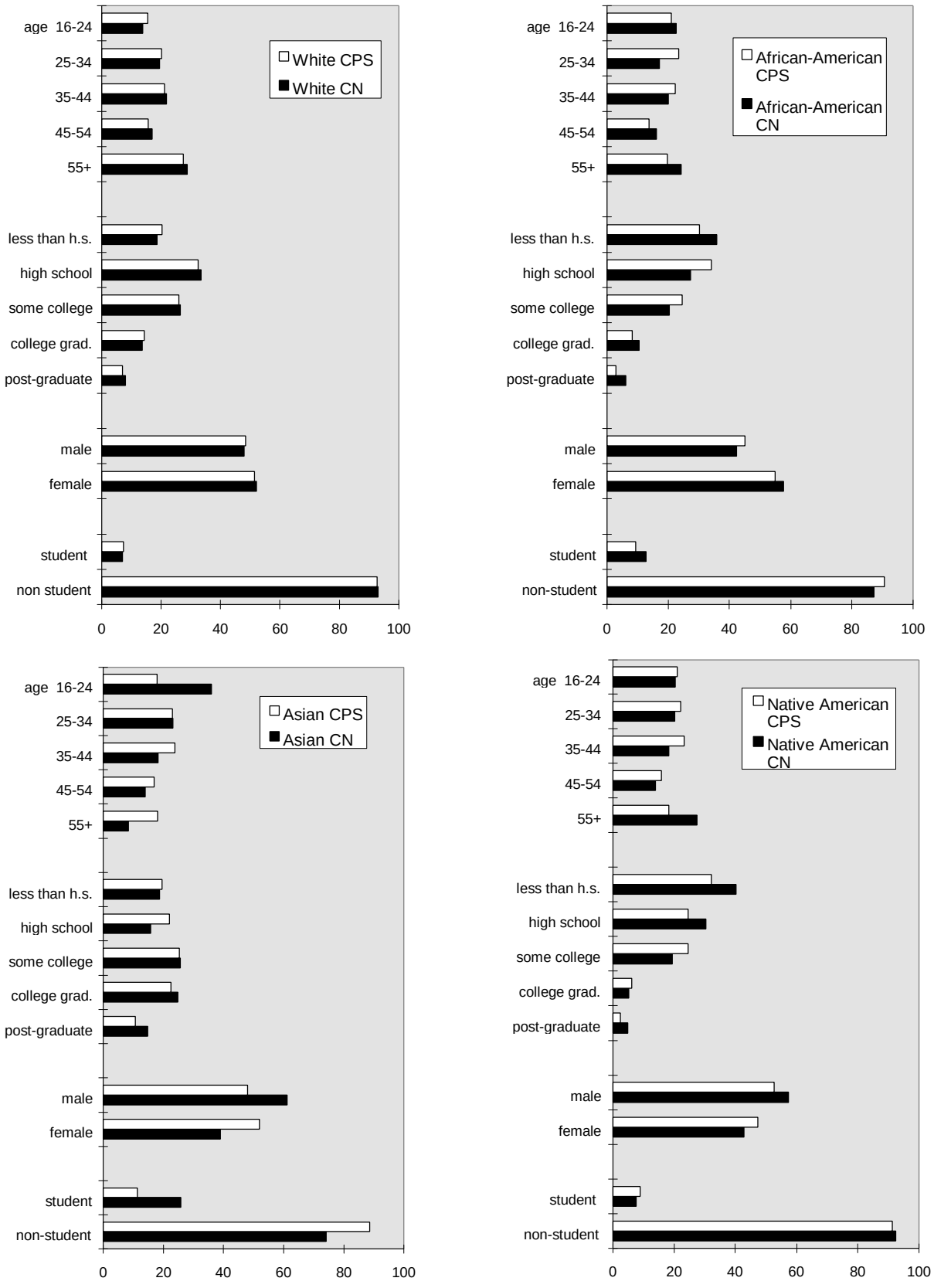

Figure A2a - Demographic Distributions by Race/Ethnicity, CommerceNet/Nielsen vs. Census 1995 CPS

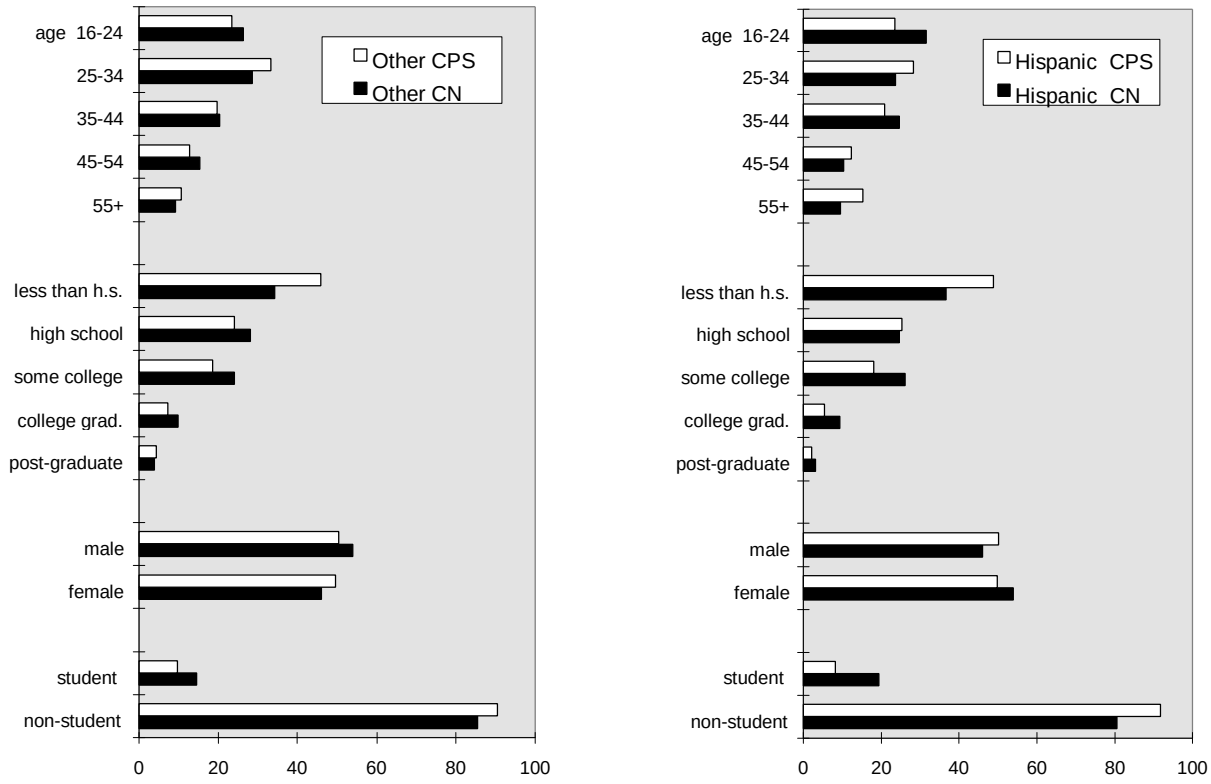

Figure A2b Demographic Distributions by Race/Ethnicity, CommerceNet/Nielsen vs. Census 1995 CPS

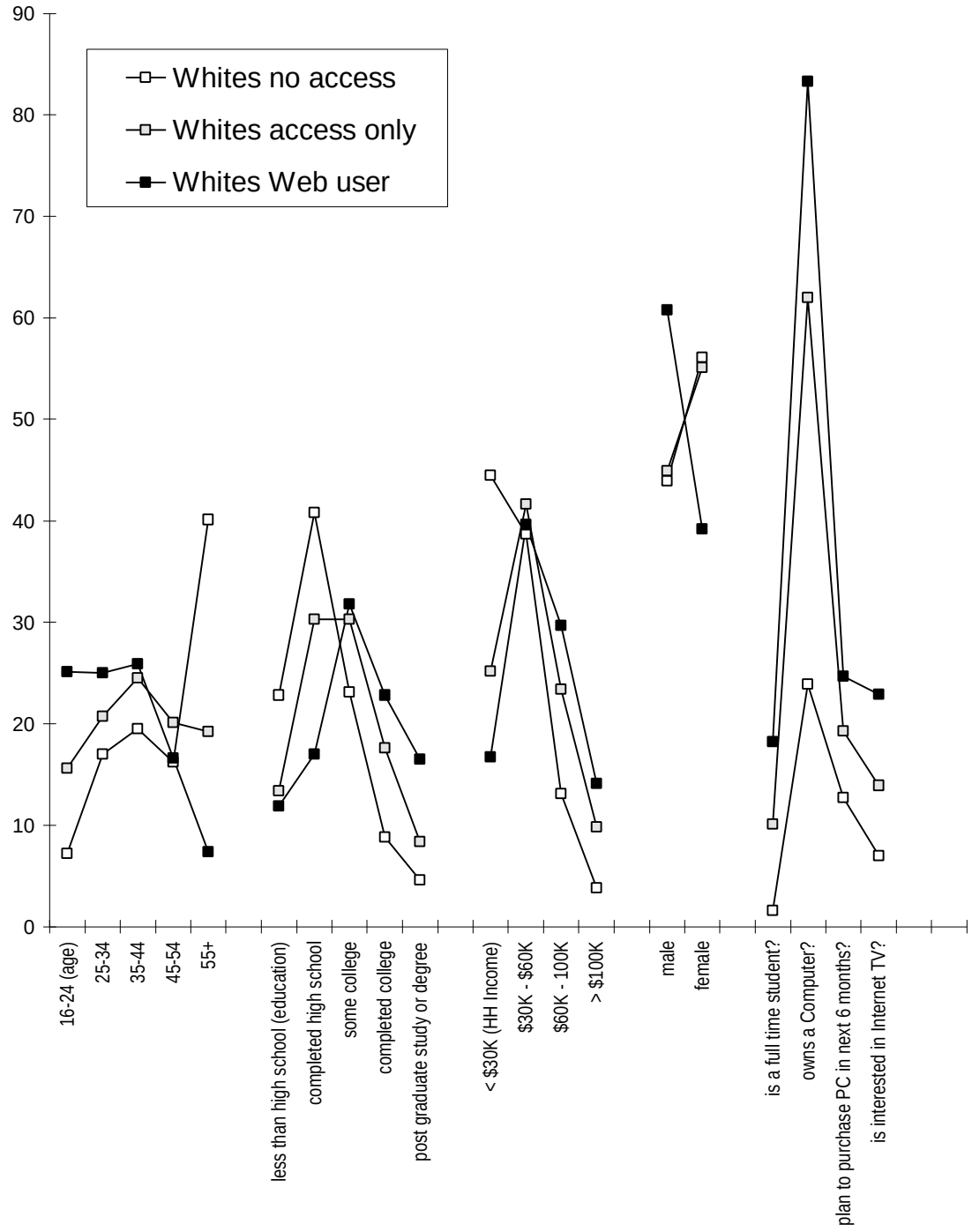

Figure A3a - Weighted Percentages of Demographics by Web Access (whites)

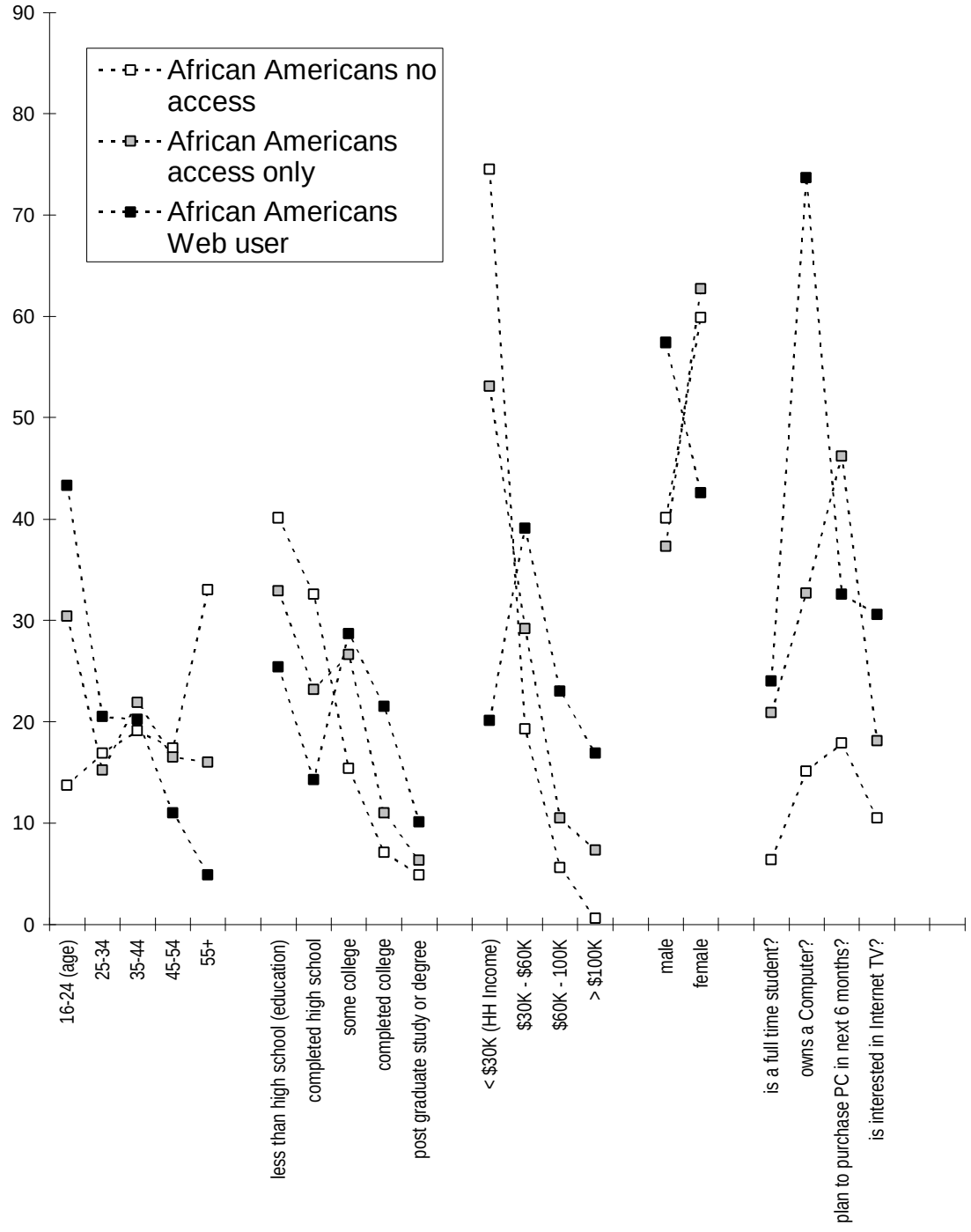

Figure A3b - Weighted Percentages of Demographics by Web Access (African-Americans)

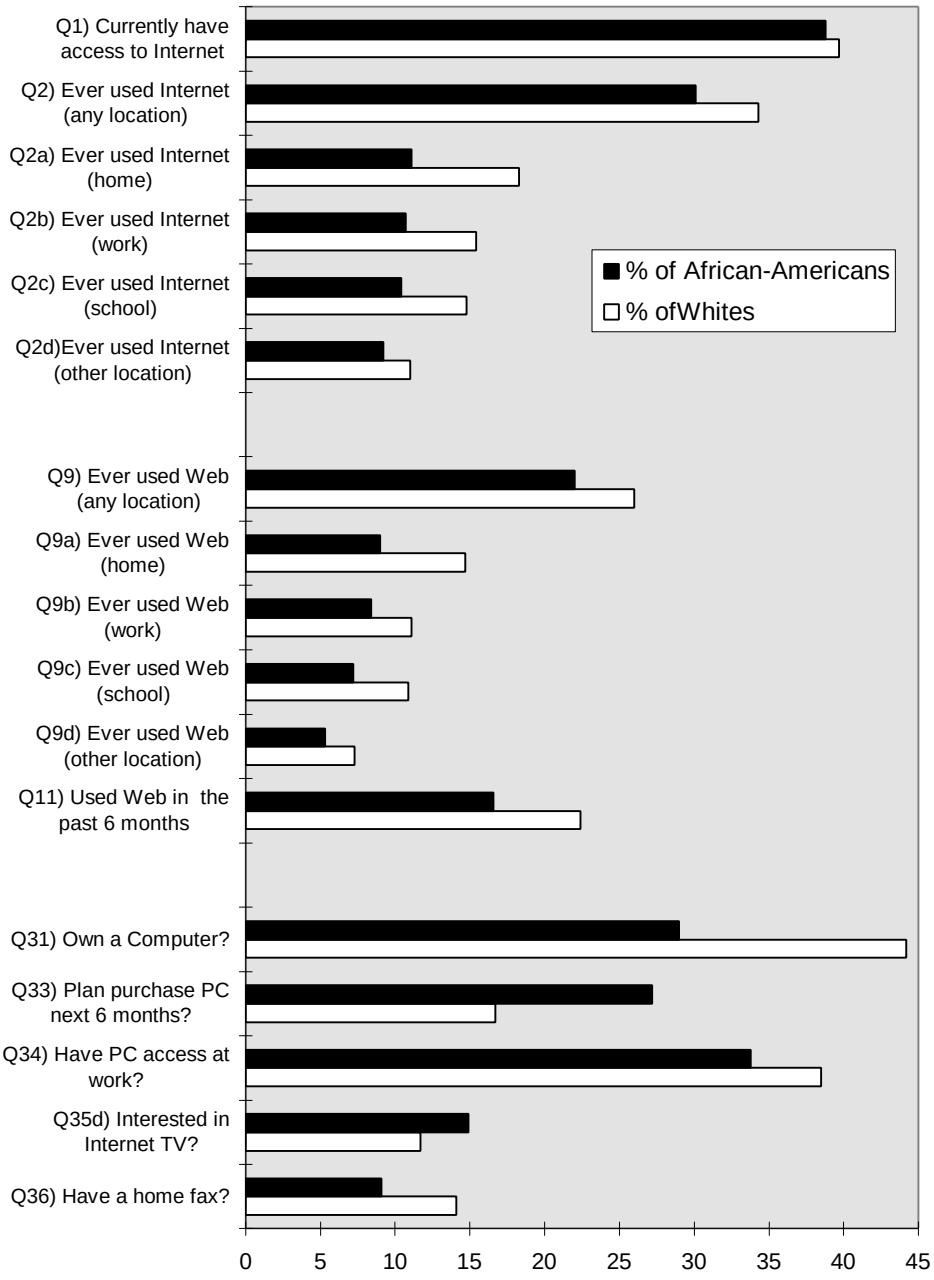

Figure A4 - Weighted Percentages, by Race, Unadjusted

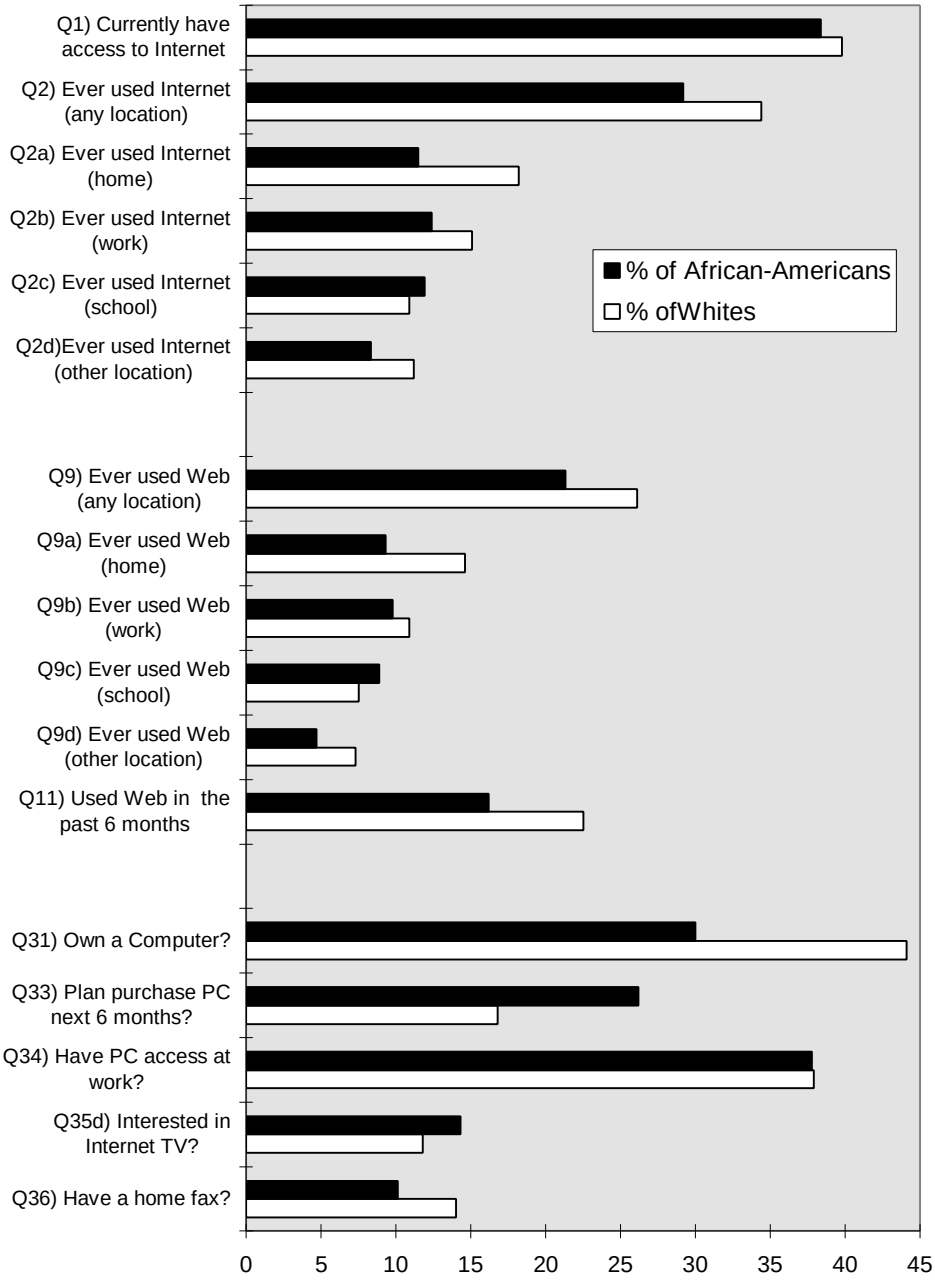

Figure A5 - Weighed Percentages, by Race, Adjusted for Age, Education, Gender and Student Status

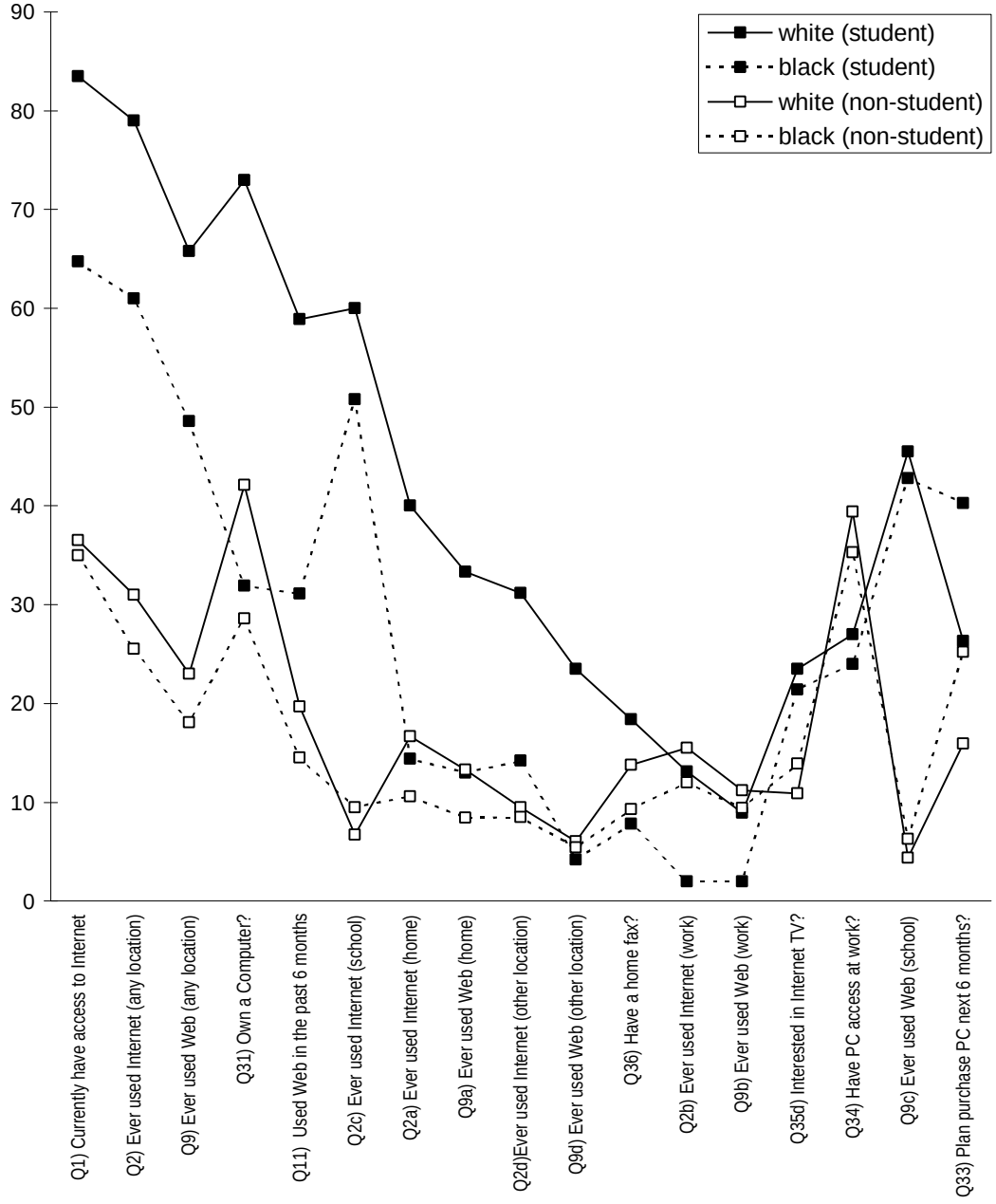

Figure A6 - Weighted Percentages for Interactions of Race by Student Status

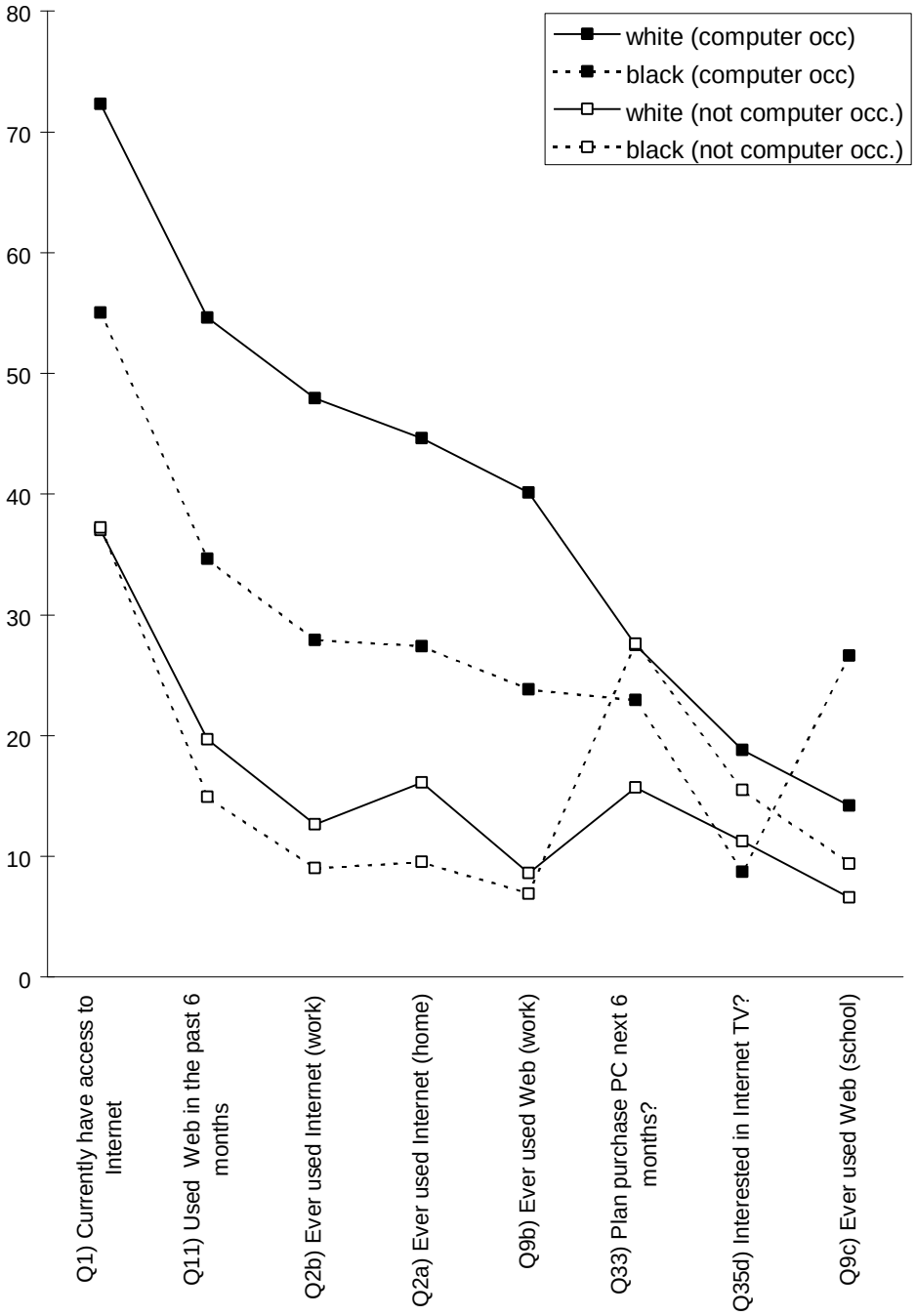

Figure A7 - Weighted Percentages for Significant Interactions of Race by Computer Occupation

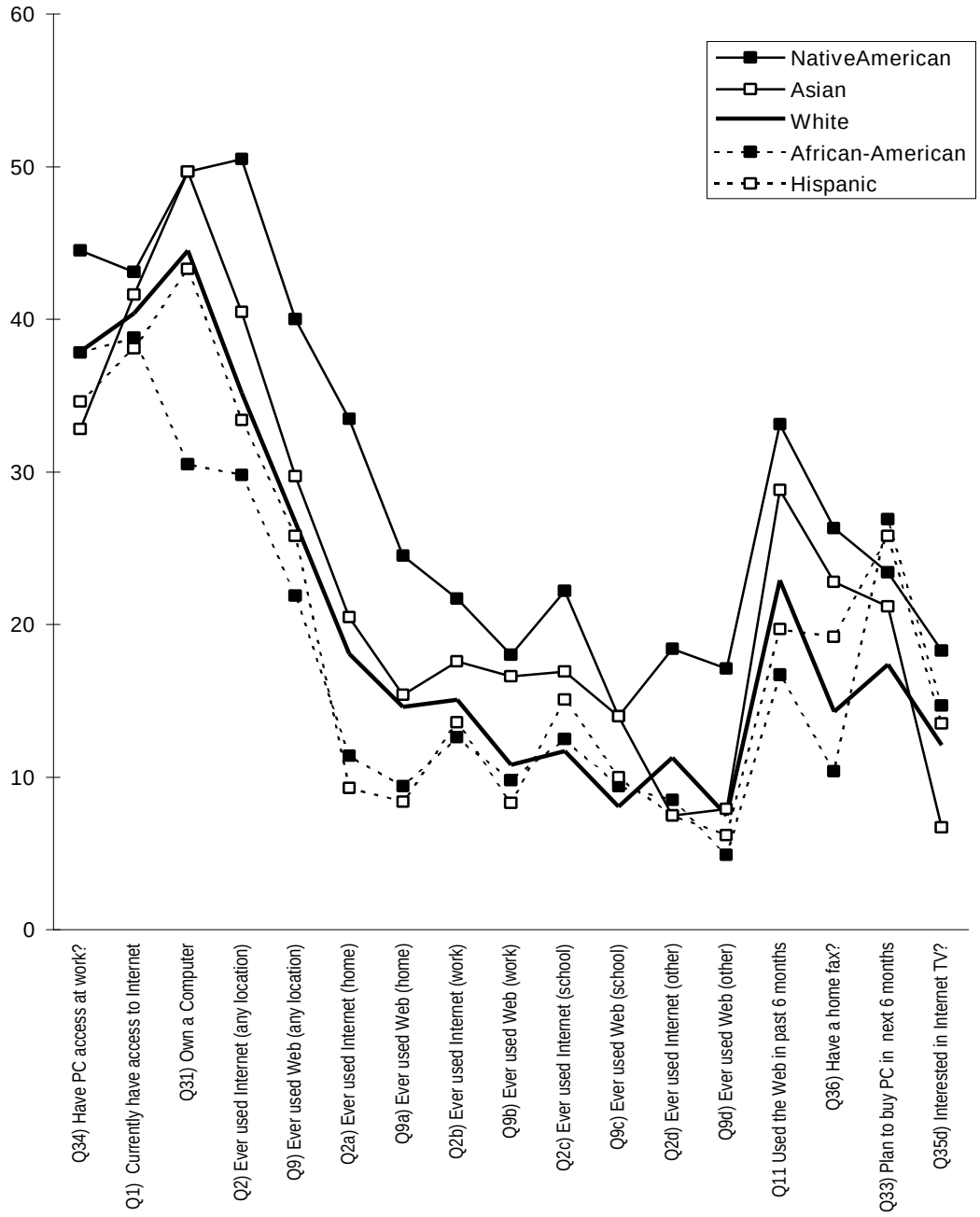

Figure A8 - Weighted Percentages by Race/Ethnic Groups Adjusted by Age, Education, Gender and Student Status

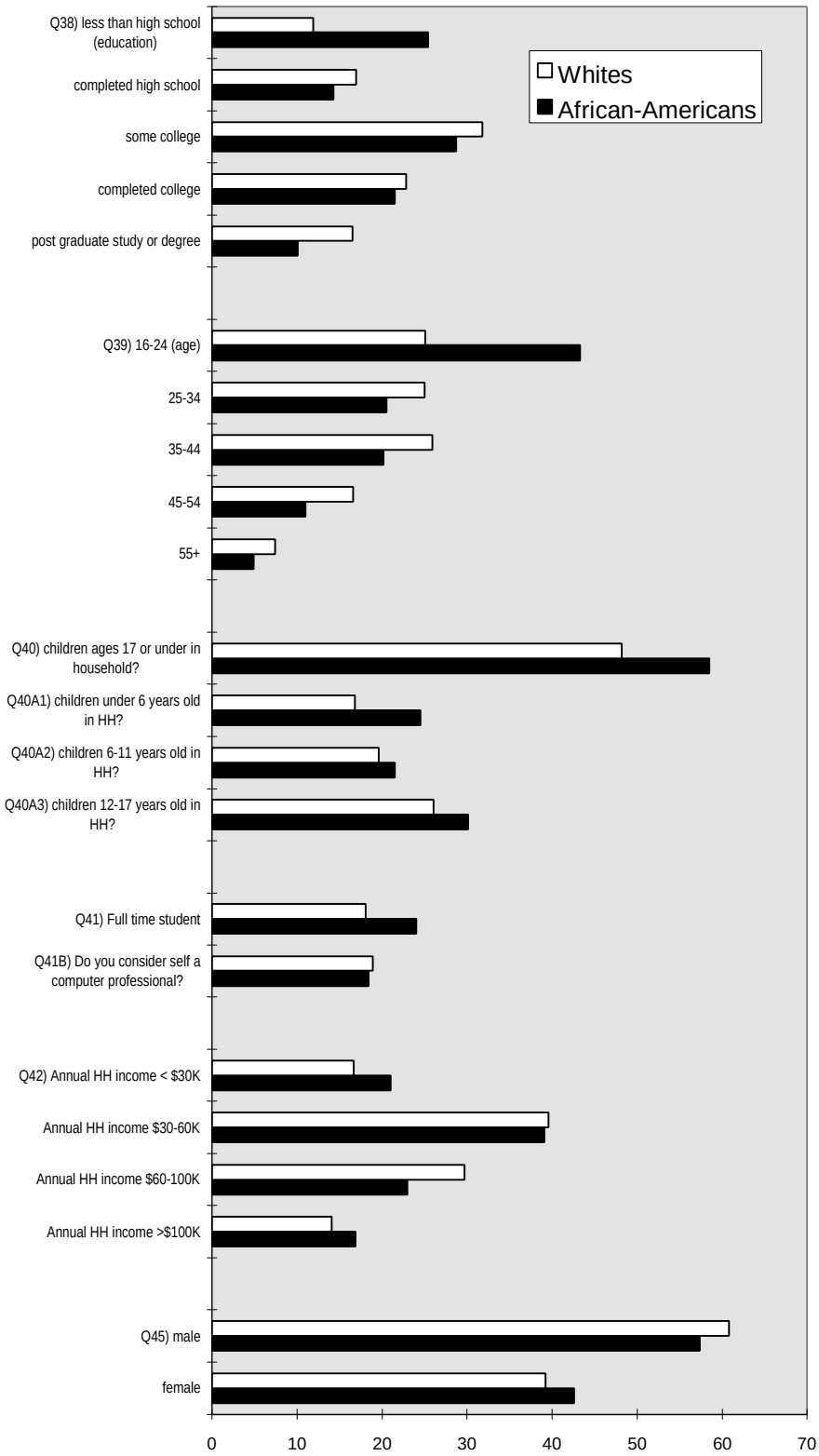

Figure A9 - Weighted Percentages for African American and White Web Users (Demographics)

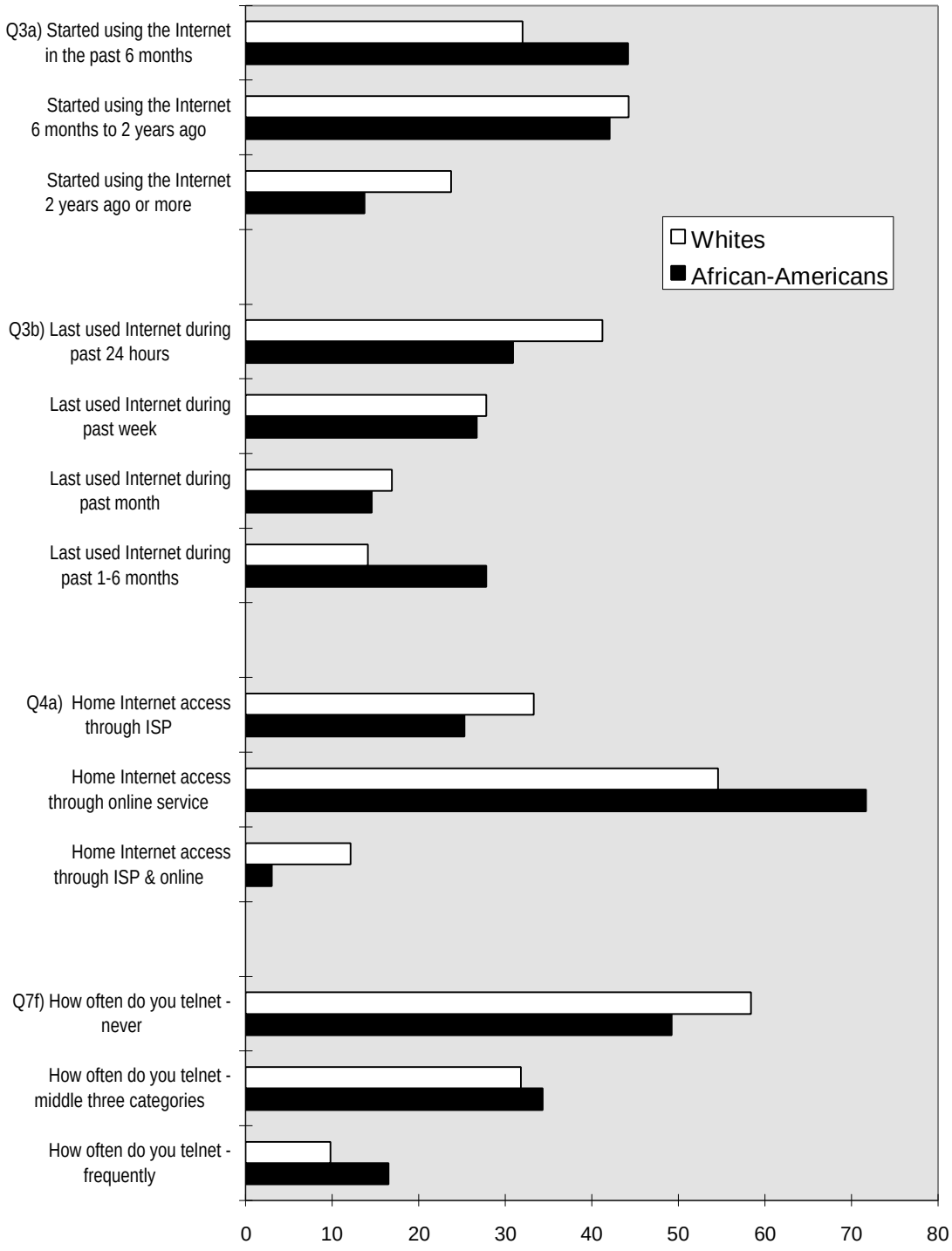

Figure A10 - Weighted Percentages for African American and White Web Users (Internet Items)

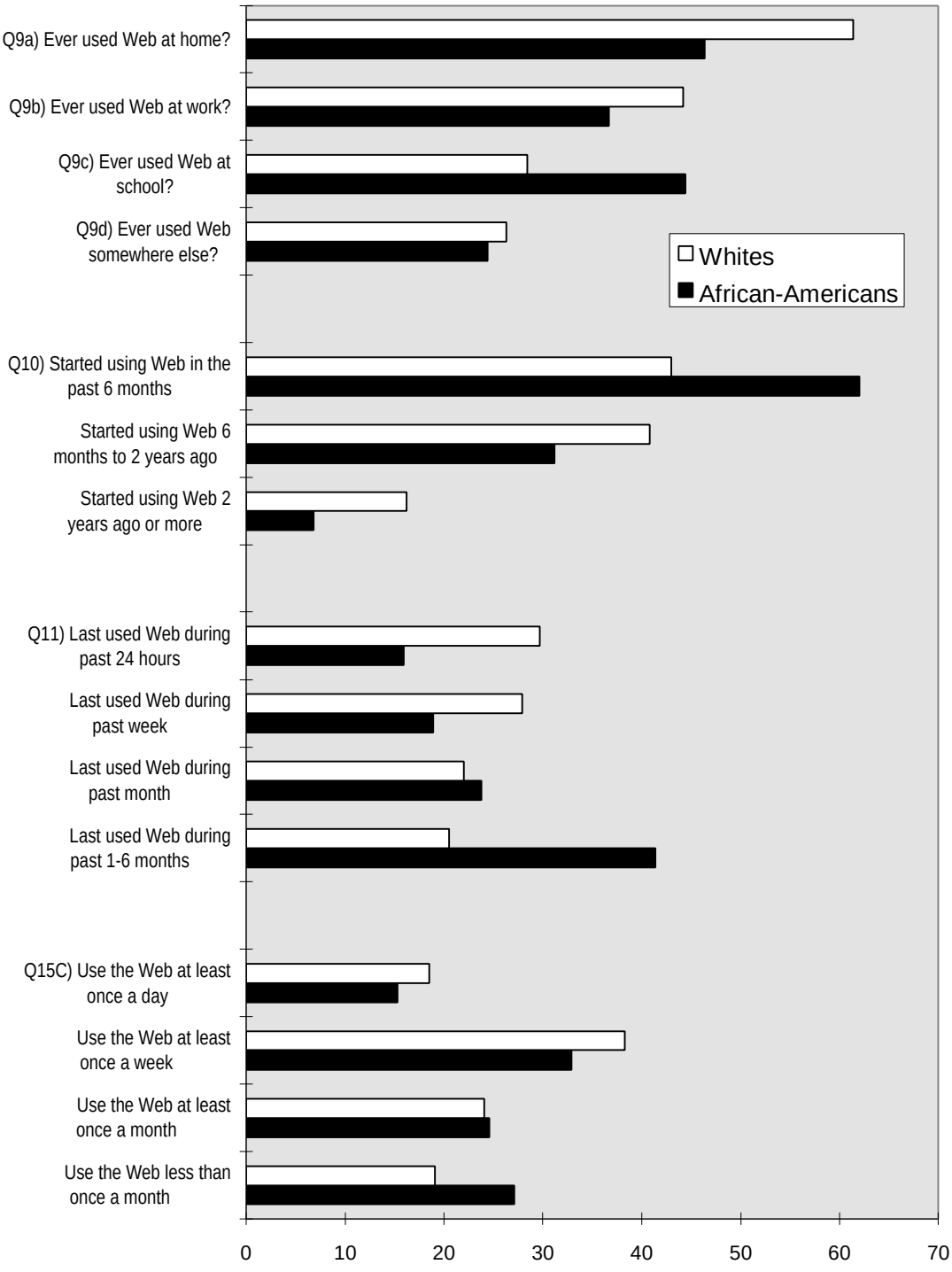

Figure A11 - Weighted Percentages for African American and White Web Users (General Web Items)

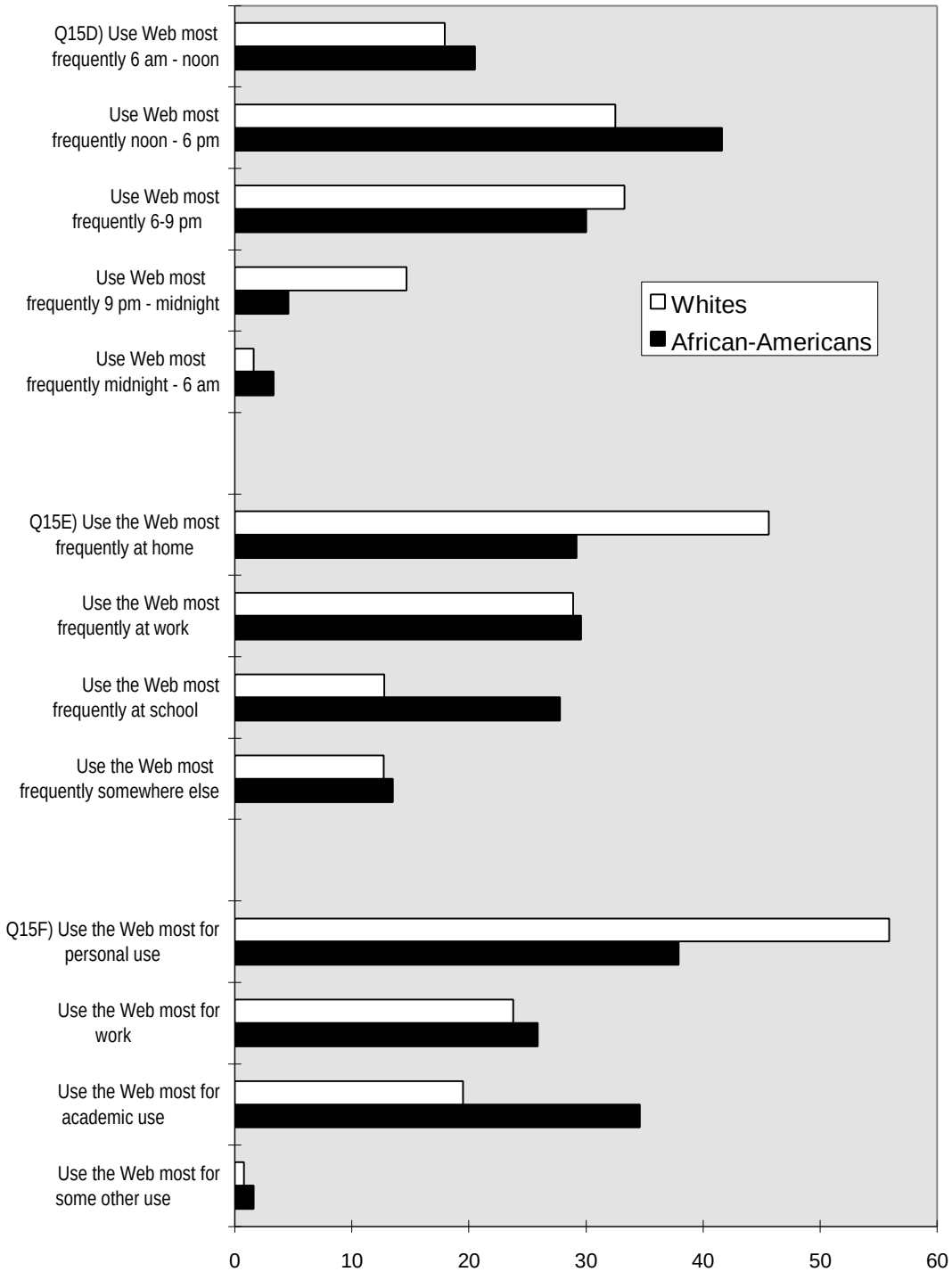

Figure A12 - Weighted Percentages for African American and White Web Users (Web Usage Situation Items)

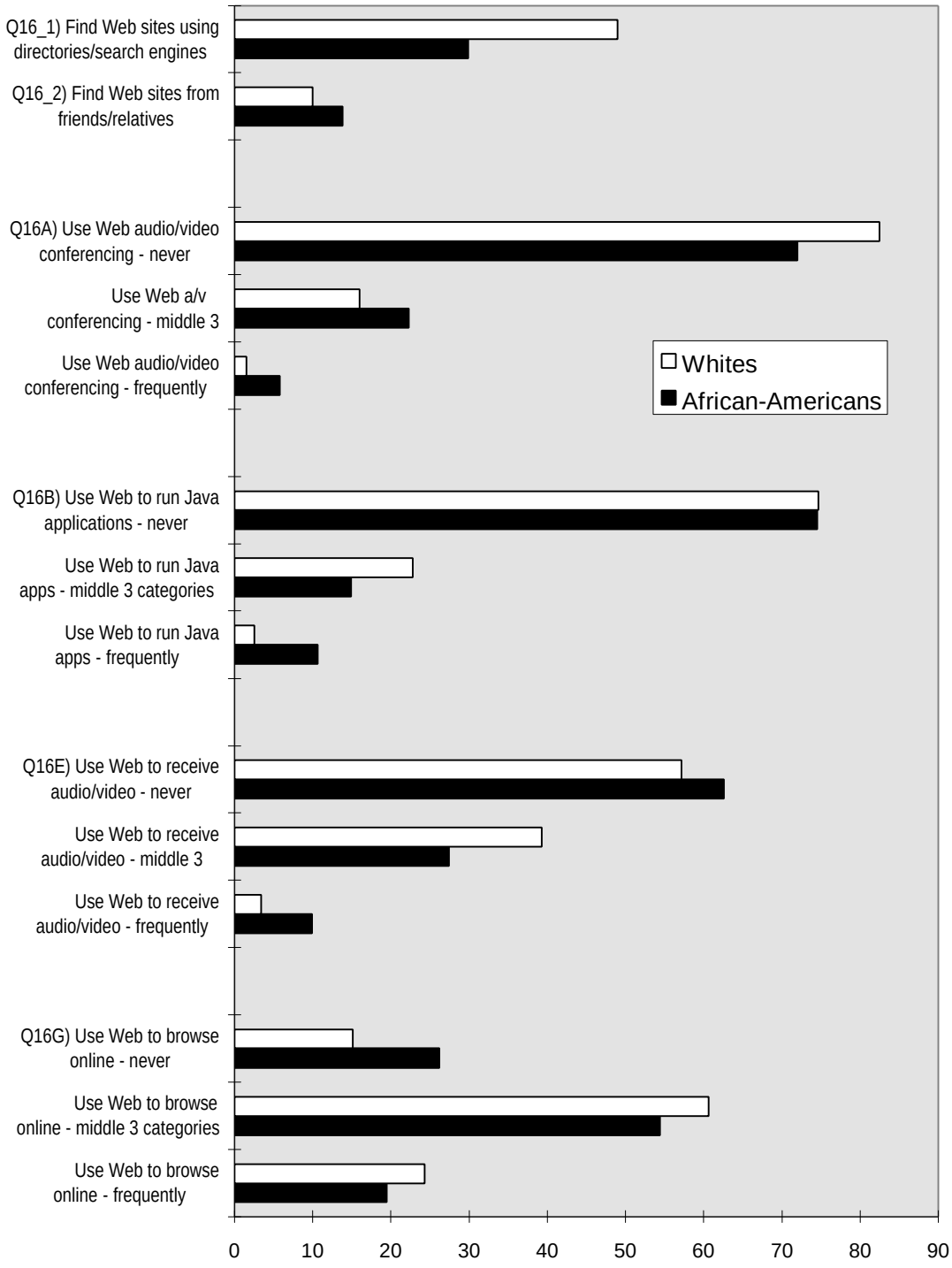

Figure A13 - Weighted Percentages for African American and White Web Users (Web Application Items)

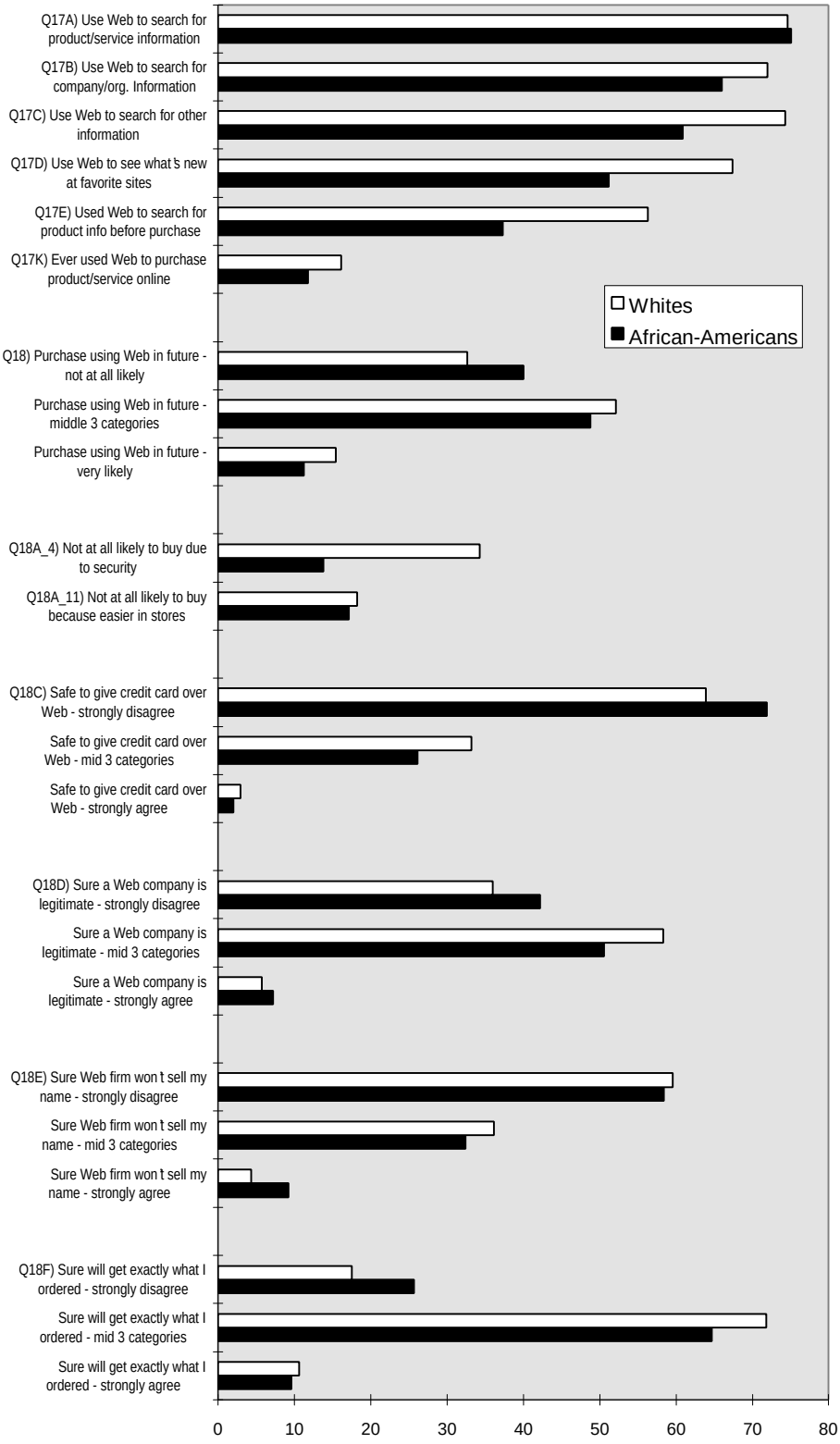

Figure A14 - Weighted Percentages for African American and White Web Users (Web Shopping Items)