

## **Information Literacy and U.S. Latino College Students: A Cross-Cultural Analysis**

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Dedication: In memory of Dr. Karin Durán, Chicana/o Studies Librarian, California State University Northridge, California, USA.

# **Information Literacy and U.S. Latino College Students: A Cross-Cultural Analysis**

## ***Abstract***

**Purpose:** To present a cross-cultural analysis of information literacy and library use among Latino and white undergraduates in an American university.

**Design/methodology/approach:** A large-scale, random sample survey of information literacy skills, and library instruction experiences and attitudes was undertaken at a large public university in the United States.

**Findings:** More white students accessed the Internet from home than Latino students; however, both spent an equal amount of time searching the Internet and library databases. Latino students used the physical library more than white students. More Latino than white students had formal library instruction. Over two thirds of the respondents agreed or strongly agreed that their research skills contributed to their academic success. Latino students did not perform as well as white students on the test questions on information literacy knowledge.

**Research limitations/implications:** While an argument over the relative merits of an objective test of information literacy versus direct assessment of student work is beyond the scope of this study, it would be worthwhile to undertake to see if the results would be different.

**Practical implications:** Given the differences in test scores despite more Latinos attending library instruction, improvements in outreach, pedagogy, and assessment methodologies may be needed.

**Social implications:** As there are over 220 Hispanic-Serving Institutions of higher education in the United States, these findings could be applicable to other libraries.

**Originality/value:** Few if any researchers have compared test scores on information literacy knowledge and library use based on a cross-cultural analysis.

**Keywords:** Latinos, college students, information literacy, library use, assessment, United States

**Classification:** Research paper

# **Information Literacy and U.S. Latino College Students: A Cross-Cultural Analysis**

## ***Introduction***

From 2002 until 2008, the Oviatt Library at California State University, Northridge (CSUN) had a USD \$1.6 million grant funded by the United States Department of Education, Title V, Developing Hispanic-Serving Institutions (HSI) program (Solis and Dabbour, 2006). CSUN, one of the largest single-campus universities in the United States, is the only public university located in the San Fernando Valley, which is a suburb of Los Angeles, California, and home to more than 1.8 million residents, of which 42.4% are Hispanic (Roberts, 2010). Undergraduate Latino [1] enrollment at CSUN has averaged 28.8% from 2000 to 2009 with white students making up approximately 30% of the total.

One of the goals of the Oviatt Library's HSI grant project was to create and administer an information literacy and library use survey to a large-scale, random sample of CSUN students. The objectives were to: 1) determine students' information literacy; 2) discover students' library and Internet research habits; and 3) reveal students' experiences with and attitudes toward library instruction and information literacy skills. Furthermore, given campus demographics, a cross-cultural comparison between Latino and white students' responses would be performed.

When this survey was conducted in the spring of 2004, the assumption was that Latino students would not perform as well as white students at CSUN on a standards-based (Association of College and Research Libraries, 2000) test of knowledge of information literacy skills. This was partly based on data showing that U.S. Latinos in general have lower rates of home access to the Internet, and hence, exposure to electronic library resources. Back in fall 2001, 31.6% of U.S. Latinos versus 59.9% of whites used the Internet (National Telecommunications and Information Administration, 2002). Despite gains made in Internet use by Latinos, according to a government report, 52.8% of Latinos compared to 73.3% of whites used the Internet in 2009 (U.S. Census Bureau, 2010), therefore, one can assume this situation persists.

The hypothesis for this study was also based on data showing prior inequities in preparatory high school education in the region served by California State University Northridge. Latinos make up the majority of seniors (final year students) in the publically funded Los Angeles Unified School District (LAUSD), which serves as the major source of feeder high schools for CSUN. In 2003-04, Latinos in LAUSD made up 62.3% of high school graduates, and in 2007-08, they were 65.0% of the total. Furthermore, while 50.5% of white LAUSD graduates had taken the required set of courses to enter a publically funded university in California as freshmen students (first year undergraduates); only 30.8% of Latino students were similarly prepared (California Department of Education, 2009). According to a recent campus report, Latino freshmen students at CSUN are more likely than their white counterparts are to need access and retention services, to be female, have lower college entrance examination scores, and enter with lower high school grade point averages (Huber, 2007). Therefore, these digital and educational "divides" between Latino and white students at CSUN formed the basis of this study.

## **Literature Review**

The literature on academic libraries and Latino or other minority students describes successful library instruction, faculty-librarian collaboration, or outreach efforts (Ayala, *et al.*, 2000; Delgado and Luévano, 2007; Hein and Miller, 2004; Hinojosa, 2000; Walter, 2005). It also links library use and/or attitudes toward libraries to student learning outcomes based on race or ethnicity. For example, Asian students comprised the largest “minority” population on the San Jose State University campus where Liu and Redfern (1997) concluded that successful library use was positively correlated to English proficiency and frequency of library use, including asking questions at the reference desk. However, success was measured based on a self-reported analysis of ease of finding information and not objective measures. A variety of qualitative methods were used for an unpublished doctoral dissertation by Mestre (2000). She found that an average of 37.5% of U.S. and non-U.S. born mostly Puerto Rican Latinos enrolled in three different research methods courses at the University of Massachusetts, Amherst felt their grades improved after using the library versus 24% of non-Latinos. Furthermore, Mestre discovered that social class, including educational attainment of parents or cultural dominance were more indicative of the frequency, comfort, and type of library use than language or ethnicity.

Similarly, Whitmire (2001) found through a secondary analysis of a large-scale survey data set that there was a strong correlation between high school library use and continued academic library use in the first three years of college. Furthermore, background characteristics such as race, while statistically significant in the first two years of college, were not significant by the third year. However, in a later study, the same author discovered that more students of color, including Latinos, used the academic library more frequently for a variety of reasons when compared to white students. Specifically for Latino students, this frequency was explained by course learning activities (class participation and additional readings), writing experiences, and the number of non-assigned books read. (Whitmire, 2003)

Adkins and Hussey (2006) interviewed a small group of Latino students to study attitudes toward libraries and librarians in relationship to culture and language use. They found that academic library use was more a product of informational need, rather than a need for cultural reinforcement given that the public library was perceived as more relevant for cultural support. Zhong and Alexander (2007), who found that more Mexican American than other campus student groups cited book collections as most important in helping them with their academic work, further substantiated this.

”Generation 1.5,” which is defined from the U.S. perspective as native-born, second generation Latino students who are still learning academic English whether they speak English or Spanish at home, was studied at California State University, Los Angeles (Haras, Lopez and Ferry, 2008), and at California State University, Bakersfield (Asher, Case and Zhong, 2009). Both groups of researchers examined the effect of language spoken at home by Latino students in relationship to library use. Haras *et al.* (2008) studied the pre-college (kindergarten through high school) library experiences of first year undergraduates and found that students who did not use libraries during the pre-college years frequently reported lower information literacy skills development. Furthermore, Asher *et al.* (2009) found differences in computer and Internet access between Generation 1.5 and non-Generation 1.5 student groups. While both groups reported equal rates of computer access at home, the Generation 1.5 students had less Internet access, and of those that

did, most relied on dial-up access whereas the non-Generation 1.5 students reported high-speed Internet access. The library as a physical place was considered more important for Generation 1.5 students, as both a quiet place to study and to access computers, even if computer access was also at home, most likely due to the availability of newer equipment and software.

Indeed, the importance of the library to overall campus outcomes has been studied both within and outside the library and information science literature. Kelly's thought piece (1995) and Lindauer's descriptive analysis (1998) illustrated a theoretical need and framework for tying library resources and activities to campus student learning outcomes. An oft-cited article by Mallinckrodt and Sedlacek (1987) found a positive correlation between hours spent in campus libraries and student retention in a comparative study of African American students at the University of Maryland. Saenz et al. (1999) developed a model of the relationship between college experience and academic performance for the retention and success of U.S. minority students. College experiences that influenced retention were described as variables affecting academic and social integration. Studying in a library was viewed as both evidence of participation in the social life of a campus as well as a place for silent, uninterrupted reading and preparation for coursework in support of academic performance. Few if any researchers have compared the performance of U.S. Latino and white college students based on an objective test of information literacy knowledge.

## **Method**

A printed survey utilizing close-ended, multiple-choice questions was developed that included test questions based on the Association of College and Research Libraries' Information Literacy Competency Standards (2000), demographic questions that included library experience, and a self-reported rating of information literacy skills and their perceived impact on student success. The self-administered survey was piloted for readability with students enrolled in one section of the freshman (first year) seminar and the sophomore (second-year) level Chicana/o Studies research methods class. The project received exemption from human subjects review in the fall 2003. One thousand CSUN students, or approximately 3% of the fall 2003 headcount, was the target population. A sample of courses rather than of individual students would increase return rate, as students would be more inclined to take the survey during class time than on their own. A printed, self-administered survey was chosen instead of an online survey since not all classrooms would have Internet access, and results would not be skewed in favor of more technologically perceptive students.

In March 2004, the CSUN Office of Institutional Research generated a random sample of 65 classes from that spring term, representing an oversampling of 2,191 enrolled students from across all disciplines, class levels, and time schedules. Requests to participate in the survey were sent to the faculty via email, followed by campus mail, and finally by phone. Out of the 65 sampled classes, 45 (69%) of the faculty allowed 15 minutes of class time to have a library employee administer the printed survey. One thousand and twenty-five (1,025) surveys were collected, representing a return rate of 46.8% of the total sample of students. As the goal of 3% ( $n=1,000$ ) of the total CSUN student population was met, the sample is adequate. SPSS/PASW was used to compile descriptive statistics on the entire population of respondents and cross tabulate data on Latino students and compare them to white students.

## ***Results and Discussion***

### **Demographic Data**

Basic demographic data from all of the respondents, including race/ethnicity were mostly representative of the total fall 2003 student population. Mexican American and “other Latino” respondents comprised 24.5% of the total survey respondents (campus population was 23.7%); while 40.1% indicated “white,” which was higher than the total campus population of 32.2%.

Cross tabulations focused on Latino and white survey respondents. As was the case with the total population of CSUN students, 88.7% of Latino and 85.1% of white participants were full-time students. However, there were differences in class levels between the two groups: 37.1% of Latino compared to 42.8% of white respondents identified themselves as seniors (final year undergraduates). Furthermore, 54.9% of Latino versus 28.6% of white respondents started CSUN as freshmen (first year undergraduates). In contrast, 59% of white respondents and 40.9% of Latinos started out as transfer students (having earned units from other colleges).

As transfer students at CSUN typically have a much higher graduation rate than students who started as freshmen (73.5% of transfers versus 42.9% of freshmen graduate after six years or less), this might have explained the proportionally higher rate of white versus Latino seniors. Indeed, campus data from 2003 confirmed that 40% of Latino CSUN students who started as freshmen graduated after six years versus 62.75% who started as transfers and graduated after four years. In contrast, 51.3% of white CSUN students who started as freshmen graduated after six years versus 68.5% who started as transfers and graduated after four years. Furthermore, these campus data have remained consistent in recent years although all have shown small but steady increases. Therefore, campus demographics have not changed enough to reduce the significance of the demographic data from the survey these six years later.

### **Internet and Electronic Library Use**

As shown in Figure 1, there were definite differences from where Latino and white students accessed the Internet. Twenty-two point three percent (22.3%) more white students accessed the Internet most often from home/dormitory. This is not surprising considering that national level data gleaned from the U.S. Census Bureau’s October 2003 Current Population Survey (Day, Janus and Davis, 2005) found that for white households, 59.9% had Internet access at home. On the other hand, the same survey found that 36% of Latinos had Internet access at home, a difference of 23.9%. This was supported by the survey data, which showed that 19.9% of CSUN Latino students compared to 5.9% of white students had accessed the Internet most often from the Library or campus computer lab. Furthermore, 14% of Latino students also indicated that they accessed the Internet from work versus 6.5% of white students. These data remain proportionally consistent, although both show a marked increase in home Internet access over time. In 2009, 52.8% of U.S. Latino households had Internet access at home compared to 73.3% of white households, a difference of 20.5% (U.S. Census Bureau, 2010). Therefore, one could

assume that nothing much has changed in terms of differences between white and Latino CSUN students and how likely they are to have access to the Internet from home since 2004.

In comparing the number of hours per week using the Internet for school, work, or personal interest, both Latino and white respondents most often selected three to five hours per week (Figure 2). Tests of significance did not find any real pattern in the number of hours searching the Internet based on race or ethnicity, except that proportionally, more Latino respondents (29%,  $n=69$ ) searched less often (one to two hours per week) than white respondents (19.3%,  $n=75$ ).

As shown in Figure 3, both groups spent far less time searching electronic library resources (two hours or less per week) versus searching the Internet (Figure 2). On the other hand, a larger percentage of Latino students spent more time searching library databases than white students: 15.2% of Latino students searched library databases three to five hours per week versus 9% of white students. This may have been due to the Latino students' greater reliance on library and campus general access computing labs (Figure 1), both of which are under the Library's jurisdiction, and therefore, their workstation browsers opened up to the Library's home page. Alternatively, this may have been related to the Library's exceedingly active library instruction program aimed at students taking courses in Chicana/o Studies, which has a large general education curriculum in addition to the major, and whose students are required to take a term-long research methods class taught by a librarian.

## Physical Library Use

Respondents also indicated their specific uses of the physical library at CSUN. As shown in Figure 4, the majority of white and Latino students visited the Oviatt Library in the previous year, as indicated by their answer to the negative statement that they did not visit the library. Tests of significance did not find any patterns based on the cross tabulation by race/ethnicity with a few exceptions, which are indicated by an asterisk (\*) in Figure 4.

Latino students used the library for study and/or relaxation more (80.3%) than white students (69.7%). This may have been a further indication of Latino students' higher use of the Library for Internet access than white student use as shown in Figure 1, which was also confirmed by their higher use of Library computers for email, other software, and Internet as is also indicated in Figure 4. On the other hand, more white than Latino students used reference books to look up information (43.3% compared to 35.7%).

The rest of the data provided in Figure 4 offered confirmation of what librarians expected at that time as well as some revelations. For example, it was encouraging to find that more than 50% of each group said they used library computers to search the catalog and databases, checked out a library book, and used computers to find online periodicals in the prior year; furthermore, almost half (47.6%) of both groups asked a reference librarian for information. While using the computer to search for online library resources and asking librarians for help was not a surprise, although in-person reference transactions have been in a steady decline since 1991 (Kyrillidou and Young cited in Martin, 2009), common knowledge and statistical evidence suggests that

books were not being used as much as online resources. According to a report issued by the American Library Association's Office for Research and Statistics, which tracked academic library trends from 1999 to 2009:

“While visits to academic libraries increased in FY 2008 from FY 2002, use of other services has declined during this same period. During FY 2008, 3,827 academic libraries reported 138.1 million circulation transactions from the general collection. This is an overall decline of six million from FY 2006 . . . .” (Davis, 2009)

Although librarians would prefer that 100% of the respondents indicated that they checked out books in the previous year, it was still somewhat heartening to discover that books still mattered to more than half of these students. It is also not surprising to find out that media, microfilm, print periodicals, and archival materials had the lowest positive response rate among the questions asked, besides “other,” and there were no real differences between the two groups.

### **Attitudes toward Library Instruction and Information Literacy**

Survey respondents related their experiences with formal library instruction, both prior to and since matriculation at CSUN. Fifty-five percent (55%) of Latino and 57.1% of white students indicated that they had prior library instruction, and this difference was not statistically significant. However, 75.1% of Latino and 59% of white students had formal library instruction while at CSUN. As described above, since more Latino students start CSUN as freshmen (54.9% of Latino versus 28.6% of white students), and the library has an exceedingly active instruction program for freshmen, including summer orientation and preparatory courses, first year experience, and required freshman-level writing composition and mathematics courses, this could explain this difference. In addition, as was mentioned above, the Library's outreach and instruction program for students enrolled in Chicana/o Studies Department courses most likely also accounted for this difference.

Students also provided a self-rating of library/Internet research skills on a five-point scale (“excellent” to “poor”). As shown in Figure 5, the pattern that emerged did not reveal a significant difference between Latino and white students. When analyzed together, most (36.9%,  $n=222$ ) rated themselves as “good,” followed by “very good” (29.7%,  $n=179$ ), “fair” (19.3%,  $n=116$ ), and “excellent” (10%,  $n=60$ ). Only a few answered “poor” (3.2%,  $n=19$ ) or found the question “not applicable” (1%,  $n=6$ ).

Similarly, respondents reported on a five-point Likert scale if they thought their library instruction experience helped them do better on research assignments. Again, tests of significance found only slight differences between Latino and white respondents in terms of those who “strongly agreed” or “agreed.” (Figure 6)

Furthermore, when asked for their agreement level with the statement “my library/Internet research skills have contributed to my academic success,” 69.3% ( $n=158$ ) of Latino and 73.9% ( $n=277$ ) of white students “strongly agreed” or “agreed,” which was encouraging, and did not reveal any significant differences between the two groups. (Figure 7)

## Information Literacy Test Results

Figure 8 shows the abbreviated test questions, correct answers, the number and percent of correct responses by Latino and white students, the total number and percent of Latino and white students' correct responses based on the total respondents, and total mean scores. The total mean correct score for all test questions was 58.2% for Latino students and 66.3% for white students, which is not a significant difference overall. On a question-by-question basis, combined Latino and white respondents scored lowest on question 7 about knowing the definition of a peer reviewed journal (38.5%) and highest on question 9 on recognizing a citation for a magazine article (83.1%). Tests of significance found that in six out of the 13 questions, which are indicated in Figure 8 by an asterisk, Latino students did not perform as well as white students. However, for most of the test questions, one cannot conclude that the scores were solely based on the independent variable being tested (race/ethnicity).

Question 1 showed a slight difference between Latino and white students, since both groups also chose the other responses at about the same rate. Also interesting was the difference between the scores for question 3 on the best source of immediate news: one could speculate that white students may have had more familiarity with English language Web-based news outlets such as CNN.com. Furthermore, the next highest scoring answer for question 3 was "today's *Los Angeles Times*," which was selected by 26.8% ( $n=63$ ) of Latino and 22.7% ( $n=87$ ) of white respondents. Most likely, both groups did not think about how today's print newspaper is yesterday's news, and were equally confused.

Question 4, which asked which source provided access to periodical articles, had white students performing better than Latino students did; although both groups had disappointing scores (55.2% and 44.7% respectively). The overall low scores could be attributed to a lack of knowledge of library jargon (e.g., "periodical"), and the difference between the two scores could reveal language differences. Indeed, the word "periódico" in Spanish translates into "newspaper" in English, and yet the question refers to "magazine" articles. Furthermore, for question 6, "library catalog" was chosen by 19% of Latino versus 13.1% of white respondents, which would be a more familiar term in that the Spanish translation is "catálogo." According to a report from the National Center for Education Statistics, over one-half (57%) of Latino school-aged children spoke mostly English at home, one-fourth (25%) spoke mostly Spanish, and 17% spoke both English and Spanish. Therefore, one could assume that language may play a part in the students' performance on these questions (Llagas and Snyder, 2003).

Question 8 asked respondents to judge the most unbiased source of information about electric-powered cars from the choices presented (*Consumer Reports*, "Electric Car Retailers Association," and "American Petroleum Institute"). Although both groups did well, 80.9% of white students answered correctly compared to 70.3% of Latino students. Furthermore, 14.8% of Latino students selected "do not know" compared to 8% of white students. Again, this could be explained by language differences as well as exposure to *Consumer Reports* magazine. Although 80.3% of Latino and 84.8% of white participants could recognize a magazine article citation (question 9), only 57.8% of Latino, and 67.4% of white respondents could correctly identify a book citation. Furthermore, while race/ethnicity was not significant in correctly recognizing an

article citation, it was somewhat relevant as to how they did with the book citation (question 10). Question 11 asked for students' knowledge of the Boolean "and." The data revealed that race/ethnicity played a small role in respondents' performance: 48.3% of Latino in contrast to 56.4% of white students answered correctly.

By far, the most dramatic difference between the groups occurred in the students' answer to question 12: "Before citing a web page for a term paper, the following is most important to know: the author's/organization's expertise, information based on facts/reasoned opinion, and professor allows the use of the Internet." Respondents could choose one, two, three, or all three responses. The correct answer was to select all three responses: 57% of the white students versus 39.3% of Latino students answered correctly. Furthermore, a greater percentage (14%) of Latino students chose two out of the three, "information based on facts/reasoned opinion" and "professor allows the use of the Internet." What the table also does not show is that 26.2% of Latino and 24.6% of white students left their answers blank, even when they had the option of answering, "do not know." This may indicate that the question was too complicated, and in retrospect, the use of responses such as, "A and C," "B and C," or "A, B, and C" as possible responses in tests probably contributed to respondents' confusion.

As for the questions where both groups did equally as well and performed in the 60% to 80% range (questions 2, 5, 6, and 9), there were no real differences. However, while over 70% of both groups correctly picked "journal" as the most scholarly source (question 5), for question 7, which asked what would best determine a peer-reviewed journal only 38% picked "has an editorial board" as the correct response.

Furthermore, in the case of question 13 (knowing when to cite a source), both groups did poorly (43.9% for Latino and 49.9% for white respondents) at approximately the same rate, which is telling for what could have been an overall lack of knowledge of plagiarism by all CSUN students at that time.

## **Conclusion**

Despite historical inequities in Internet access and educational preparation, this study found that Latino students at CSUN did not differ greatly from the dominant cultural group in their frequency of library and Internet use, with a couple of exceptions. While more white survey respondents accessed the Internet from home than Latino respondents, Latinos used the physical library more than whites did for studying as well as using computers to access email or software. Indeed, both groups spent an equal amount of time searching the Internet and library databases, therefore the location of Internet access did not seem to affect the frequency of electronic resource use. Future surveys of electronic library use should ask about the use of specific types of resources, including electronic books, periodicals, web sites, and databases to provide data that are more useful. Furthermore, with the advent of mobile access to library resources and the comparatively high use of these devices by Latinos and other minorities in the United States as their primary means of Internet access (Smith, 2010); this would be another area for potential research.

Three activities listed in Figure 4 suggest further topics for research on the impact of the Oviatt

Library's Hispanic-Serving Institutions grant project. Regarding the relatively low use of audiovisual materials, reference books, and archival materials by both Latino and white respondents at the time of the survey, it would be interesting to study the effects of the large acquisitions of Latino-related media, books, and archival materials on library use and/or attitudes since then. In addition to acquiring resources, the HSI grant project also promoted their use through associated film festivals, lectures, exhibits, and library instruction. (See Solis and Dabbour, 2006 for a description of these activities.)

Given the dearth of librarians in California public schools, it is not surprising that both Latino and white students had a low rate of prior library instruction (55% for Latino and 57.1% for white students). According to the latest data available from the California Department of Education (2010), in 2006, California ranked last in the United States in public school librarian staffing, having a ratio of 1:5124, whereas the U.S. average was 1:916. On the other hand, the CSUN survey revealed that 75.1% of Latino versus 59% of white students had library instruction while at CSUN. This was most likely due to a combination of successful outreach and instruction activities for freshman students, of which Latinos make up a large proportion, as well as an active library instruction program for Chicana/o Studies Department general education courses. Yet despite this instructional effort, Latino students generally performed lower both overall and on half of the individual test questions when compared to white students. Still, overall test scores for both groups were equally disappointing. While an argument over the relative merits of an objective test of some information literacy precepts versus authentic or direct assessment, such as the application of rubrics to student papers, is beyond the scope of the present study, it would be worthwhile to see if the results would be different. Furthermore, the admittedly white, English language cultural biases in the wording of some of the questions' might also have been a factor in the differences between the scores. In spite of their low scores, over two thirds of the respondents agreed or strongly agreed that their library and Internet research skills contributed to their academic success. Therefore, information literacy instruction is of value to both groups of students, but it most likely needs overhauling in terms of when, where, and how it is presented in the curriculum as well as how it is assessed.

The hypothesis for this study was that Latino students would not do as well as white students on a test of information literacy skills based on data showing the inequities in educational preparation and home Internet access. However, as this study demonstrated, these differences were not as clear-cut as was originally assumed. Therefore, one cannot conclude that race or ethnicity examined from the point of view of socioeconomic inequality or cultural differences always has a negative influence on information literacy as defined by the dominant culture. Indeed, one has to be careful to look for other relevant or more complex reasons that may explain differences in test scores, particularly when it comes to different curricular or pedagogical approaches to teaching information literacy skills to students on a highly diverse college campus.

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## **Note**

[1] The term, “Hispanic” is commonly used in the eastern portion of the United States, whereas “Latino” is commonly used in the western portion. Therefore, the term Latino is preferred in California. See: U.S. Office of Management and Budget (1997), “Revisions to the standards for the classification of federal data on race and ethnicity,” *Federal Register Notice*, available at: [www.whitehouse.gov/omb/fedreg\\_1997standards](http://www.whitehouse.gov/omb/fedreg_1997standards) (accessed 24 October 2010).