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AIDS Knowledge Among Latinos: The Roles of Language, Culture, and Socioeconomic Status

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AIDS has a disproportionate effect on persons of Latino origin, who have lower knowledge of AIDS than other ethnic groups. This study assessed AIDS knowledge among Latino adults in New Jersey according to acculturation and socioeconomic status. Data on 121 Latino adults were collected in spring 2000 using bilingual telephone interviews. Respondents were selected using the Census' Latino surname methodology. Items were adapted from the National Health Interview Survey Supplement on AIDS Knowledge and Attitudes and the Marin acculturation scale. AIDS knowledge was more strongly associated with language exposure than with self-assessed English or Spanish language abilities. Low educational attainment and bilingual language exposure were associated with lower AIDS knowledge; when other factors were controlled, place of schooling, length of time in the United States, age and gender were not statistically significant. Transmission of HIV via casual contact was widely misunderstood, but general facts about AIDS and likely means of HIV transmission were well known. AIDS education materials should be designed in both English and Spanish and should take into account the lower educational attainment of recent Latino immigrants.

KEY WORDS: acculturation; AIDS; Latino-Americans; immigrants; knowledge, attitudes, and practices; language.

INTRODUCTION

Acquired Immunodeficiency Syndrome (AIDS) and the Human Immunodeficiency Virus (HIV) have disproportionately affected the Latino population in the United States, particularly foreign-born heterosexual men and women (1). While Latinos comprise 12% of the U.S. population (2), they make up 18% of diagnosed AIDS cases (3). In the late 1990s, nearly 40% of Latinos in the United States were foreign born and an additional 29% were born in the United States with at least one parent foreign born (4). An important issue given the high proportion of foreign-born Latinos is their level of acculturation, because acculturation has been shown to be associated with AIDS knowledge (5–7).

Acculturation has been defined as "those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original cultural patterns of either or both groups" (8). Acculturation is closely related to language ability, and some research shows that the best measures of acculturation are based on questions examining the level of fluency of English, that is, reading, writing, and speaking (9–11). Among U.S. racial and ethnic groups that speak other languages, there is a range of English-speaking ability. A recent population-based survey of New Jersey adults revealed that one-third of Latinos spoke predominantly English (12). Census figures from 1990 showed that of adult Spanish-speakers statewide, 45% spoke English

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"very well," 23% "well," and 31% "not well or not at all" (13).

As English abilities improve, individuals become more familiar with American culture and are better able to utilize available health information (14). Difficulties with communication affect both comprehension and willingness to seek out information (7), hence more acculturated individuals have more accurate knowledge about AIDS than those at a lower degree of acculturation (15). Previous studies have shown a lack of accurate knowledge concerning AIDS/HIV among Latinos (15–17). A study conducted by Marin and Marin (5) in 1990 of Latinos residing in San Francisco found that they generally had good knowledge of the major modes of HIV transmission, but believed many myths about HIV transmission by casual contact (e.g. public toilets, coughing, and sneezing). Respondents at lower levels of acculturation were also more likely to have more erroneous beliefs about unlikely modes of HIV transmission, even after controlling for education. These results concur with other findings among Latinos about the relationship between lower levels of acculturation and AIDS knowledge (6, 7).

Similar results have also been found with other correlates of acculturation such as socioeconomic status (SES) and language ability. Studies have shown that AIDS knowledge is positively correlated with both SES and English ability. A study by Miller (12) among 460 New Jersey adults found that respondents who preferred to speak Spanish and those who had less than high school education had poorer AIDS knowledge. Other studies among Latinos at low SES levels (18) and with limited use of the English language (19) have obtained comparable results.

Research has shown that there are number of widespread myths concerning HIV/AIDS transmission via casual contact. These include the belief that sharing bathrooms or using the same cooking utensils as an infected person can transmit HIV, or that the virus can be transmitted from an infected medical provider (5, 6, 12). A study by Organista *et al.* (7) found that female Mexican migrant workers believed that they could be exposed to HIV from a mosquito bite, using public bathrooms, and kissing on the mouth. Their findings were mirrored in a study of minority high school students (7). Like members of other racial and ethnic groups, Latinos have a better understanding of ways that HIV is likely to be transmitted—through sexual intercourse, sharing of IV drug needles, via blood transfusion, and from mother to baby—than ways it cannot be transmitted (12, 20, 21).

Although knowledge of the disease and how to prevent it does not assure appropriate behavioral change, it is unlikely that such change will occur in the absence of accurate information about AIDS and the modes of HIV transmission (22). Previous studies have shown that better knowledge about AIDS is associated with greater likelihood of condom use (23, 24), abstinence (25), and obtaining HIV testing (26), although some people with a good understanding of how the virus is transmitted continue to engage in risky behavior.

In addition to language differences between Latinos and others in the United States, socioeconomic status may also influence the relationship between Latino origin and AIDS knowledge. On average, Latinos in the United States are of lower socioeconomic status than other ethnic groups. They are the ethnic group least likely to have completed high school, attended college, or received a college degree (27). In large measure, the lower educational attainment of Latino immigrants to the United States is due to lower educational attainment in their home countries (28). Only 43% of foreign-born Latinos have at least a high school degree, compared to 69% of Latinos born in the United States (27).

We examine the influence of acculturation and socioeconomic status on AIDS knowledge among Latino adults in New Jersey. This paper extends previous research on AIDS knowledge among Latinos by looking simultaneously at language, other measures of acculturation, and socioeconomic status, and by distinguishing between English and Spanish language abilities and exposure to those languages in a variety of everyday settings. New Jersey is an ideal place to study patterns of AIDS knowledge among Latinos because of the size and diversity of the New Jersey Latino population. With more than 1 million Latinos in 1998, New Jersey ranked ninth in terms of the share of its population that is of Latino origin (12.4%) (29). Between 1990 and 1998, the Latino population in New Jersey increased by 34%. Latinos in New Jersey represent a very diverse community, with significant Caribbean, Central American, and South American populations. In 1997, New Jersey ranked fifth in terms of number of foreign-born population, with an estimated 1.2 million persons—approximately one out of every seven persons in the state (4). Thus, studying the Latino population in New Jersey may also provide insights into AIDS knowledge among

other ethnic groups with rapidly growing immigrant populations.

METHODS

Data were collected in the spring of 2000 from 121 Latino adults living in New Jersey. The sample was drawn from seven geographic areas in the state,[5] using the Latino surname methodology developed by the Census Bureau from a database of household telephone numbers (30). These areas were chosen because they had higher than average density of Latino persons within the state, and to represent both urban and rural settings in Northern, Central, and Southern New Jersey.

Survey items on AIDS were adapted from the National Health Interview Survey Supplement on AIDS Knowledge and Attitudes (31). The widely used acculturation scale developed by Marin *et al.* (32) was enhanced with additional questions about duration of residence in the United States and ability to read, speak, and write both English and Spanish. Sociodemographic information included age, gender, years of school completed, and Latino origin group.

The questionnaire was initially translated into Spanish by an undergraduate research assistant, then back-translated into English. The New York State Psychiatric Institute Spanish Translation Committee extensively reviewed and revised the translation.[6] The revised Spanish translation was further reviewed by the second author for equivalence to the English version and adjustments were made in both versions to ensure semantic and content equivalence (33). The revised instrument was pretested in both English and Spanish with Latinos of varying origin, linguistic ability, socioeconomic status, and age to ensure that the instructions and wording of the questions were clear, and that the introductory explanation of the study was effective.

Telephone interviews were conducted by two bilingual (English/Spanish speaking) interviewers between January and May 2000. The interviewers introduced themselves as researchers and offered prospective participants a choice of the Spanish or English version of the questionnaire. They then conducted the rest of the introduction to the study and the interview in the respondent's language of choice. The Committee on Human Subjects at the researchers' university approved the study protocol. The response rate was approximately 13% of eligible households,[7] somewhat lower than the projected response rate for a 10–15 min telephone survey aimed at the Latino population (30).

AIDS knowledge items included items on general characteristics of the disease and how it is transmitted. General AIDS knowledge was measured by seven questions about the characteristics of the disease, its symptoms, and the availability of preventive and curative interventions.[8] HIV transmission knowledge was measured by 10 questions—4 that pertained to true transmission routes, and 6 that pertained to ways the disease is unlikely to be transmitted (casual contact).[9] In addition to analyzing response patterns across language groups for each of the questions, knowledge in each of these domains was summarized using the percentage of questions that each respondent answered correctly. An indicator of whether each respondent correctly answered less than 70% of the AIDS knowledge questions was also calculated—analogous to a failing score on a test. This indicator was highly correlated with scores on individual test questions or mean test scores, and provided an easily interpretable summary measure of AIDS knowledge.

Socioeconomic status was measured by educational attainment classified as less than high school

[5]The sampling frame included Essex, Hudson, Middlesex, Passaic, and Union counties in northern New Jersey that are part of the New York metropolitan statistical area (MSA), Camden city—an urban area in central New Jersey that is part of the Philadelphia MSA, and Vineland city—a rural, agricultural community in the southern part of the state.

[6]The Spanish Translation Committee was composed of bilingual/bicultural clinicians with extensive experience providing clinical services and conducting research with a variety of Latino groups.

[7]Excludes nonhousehold or disconnected telephone numbers and households that did not include at least one Latino adult.

[8]*General AIDS knowledge questions* concerned 1) whether the respondent had ever heard AIDS called HIV, 2) AIDS reduces the body's natural protection, 3) availability of a cure, 4) whether AIDS is an infectious disease, 5) whether someone with AIDS can look and feel OK, 6) availability of a vaccine to prevent AIDS, and 7) whether someone can have the AIDS virus but not have the disease AIDS.

[9]*Likely modes of HIV transmission* include 1) sexual intercourse, 2) sharing IV drug needles, 3) blood transfusion from an infected person, and 4) from pregnant woman to baby. *Unlikely modes of HIV transmission* include 1) working near someone with the AIDS virus, 2) using public toilets, 3) eating in a restaurant where the cook has AIDS, 4) being coughed or sneezed on by someone with the AIDS virus, 5) sharing plates, cups, or utensils with someone with the AIDS virus, and 6) being cared for by an infected medical provider.

(low socioeconomic status), high school, and more than high school (high SES). Acculturation was measured by items related to language ability, language exposure, place of birth, place of schooling, and years spent in the United States.

A *language ability scale* was developed based on six questions pertaining to the respondent's self-assessed English and Spanish abilities. Respondents were asked to rate their ability to speak, read, and write in each language as "very good," "good," "fair," or "poor." Respondents with high Spanish skills and low English skills were classified as Spanish dominant (47.9%), those with high English and high Spanish skills were classified as bilingual (33.9%), those with high English skills and low Spanish skills were classified as English dominant (13.2%), and those with low English skills and low Spanish skills were classified as low literacy (5%).

A *language exposure scale* was developed utilizing answers to questions about language used most often 1) at home, 2) by friends and neighbors, and 3) at work. Possible answers to each question were "English," "Spanish," "both English and Spanish," or "other." Respondents who mentioned the same language for at least two of those contexts were classified in the corresponding language exposure category. For example, a respondent who answered "Spanish" for home and work was classified "mostly Spanish exposure," while a respondent who mentioned "both Spanish and English" for home and with friends and neighbors was classified "bilingual exposure." Respondents who did not mention the same language for at least two contexts—for example, answered "Spanish" for home and "English" with friends and neighbors—were classified "bilingual exposure." Approximately half of the sample was classified bilingual exposure, with the remainder approximately equally divided between mostly-English and mostly-Spanish exposure.

Statistical significance of bivariate associations of each of the predictors with AIDS knowledge was assessed with chi-square tests (for categorical outcomes) or *t* tests for difference in means (for continuous outcomes). Logistic regression was used to investigate the effects of language and acculturation variables on chances of failing the overall test of AIDS knowledge.

RESULTS

Characteristics of the study sample are shown in Table I. Seventy percent of respondents were born outside of the United States; however, some of them immigrated to the States shortly after their birth—as evident from only 62% reporting spending most of their childhood in their home country—and only 56% were educated mostly in their home country.

Table I. Characteristics of AIDS Knowledge Sample, New Jersey Latino Adults, 2000

	No. of cases	Percentage of sample
Place of birth		
United States	36	29.8
Home country	85	70.2
Where spent childhood?		
United States	43	35.5
Home country	75	62.0
Both	3	2.5
Where attended school?		
United States	44	36.4
Home country	68	56.2
Both	9	7.4
Origin		
Puerto Rican	37	30.6
Cuban	15	12.4
Mexican	11	9.1
Dominican	12	9.9
Central American	10	8.3
South American	32	26.4
Years in United States		
0–4	12	9.9
5–9	17	14.0
10–14	11	9.1
15 or more	80	66.1
Educational attainment		
<High school	34	28.1
High school	38	31.4
>High school	48	39.7
Age group (years)		
18–29	39	32.2
30–49	52	43.0
50 or older	30	24.8
Gender		
Male	45	37.2
Female	76	62.8
Overall sample	121	100

Puerto Ricans and South Americans comprised the largest origin groups in the study sample (31% and 26%, respectively), followed by Cubans (12%), Dominicans (10%), Mexicans (9%), and Central Americans (8%). Relative to Latinos in New Jersey in 1990, the sample overrepresented South Americans (14% of Latinos in the state), Mexicans (4%), and Central Americans (5%), and underrepresented Puerto Ricans (42%) (12). Some of these differences are likely due to substantial changes in the population of Latinos in New Jersey during the 1990s; data from the late 1990s on the relative sizes of Latino

Table II. Socioeconomic and Acculturation Factors, by Place of Schooling Among Latino Adults, New Jersey, 2000

	Place of schooling (%)				
	United States ($N = 44$)	Home country ($N = 68$)	Both United States and home country ($N = 9$)	All ($N = 121$)	Chi-square (p value)
Years in United States					26.7 (0.001)
<5	2.3	9.0	0.0	5.8	
5–9	0.0	28.4	33.3	18.3	
10–14	4.5	11.9	11.1	9.2	
15–19	18.2	16.4	22.2	17.5	
20 or more	75.0	34.3	33.3	49.2	
Educational attainment					12.1 (0.017)
<High school	11.4	39.8	33.3	28.3	
High school	31.8	31.3	33.3	31.7	
>High school	56.8	29.9	33.3	40.0	
Age group (years)					20.5 (0.000)
18–29	52.3	16.2	55.6	32.2	
30–49	36.4	48.5	33.3	43.0	
50 or older	11.4	35.3	11.1	24.8	
Language ability					64.3 (0.000)
English dominant	31.8	1.5	11.1	13.2	
Spanish dominant	6.8	75.0	44.4	47.9	
Bilingual	61.4	16.2	33.3	33.9	
Low literacy	0.0	7.4	11.1	5.0	
Language exposure					29.8 (0.000)
Mostly English	52.3	8.8	11.1	24.8	
Mostly Spanish	9.1	32.4	22.2	23.1	
Bilingual	38.9	58.8	66.7	52.1	

subgroups within the state were not available at the time of this writing.

Our sample also underrepresents recent immigrants to the United States. Only 8% of foreign-born respondents in the sample had lived in the United States for less than 5 years compared to 20% of all foreign-born Latinos (4). The use of a telephone sampling methods and data collection may have contributed to this bias, because recent immigrants may be less likely to have telephones. Even if they have telephones, their telephone number may not be included in the list used to draw the sample because high residential mobility leads to rapid turnover of telephone numbers (34).

Language and Acculturation

Language exposure and language ability were highly correlated but captured different aspects of language. More than three-quarters of respondents who were mostly exposed to Spanish were classified as Spanish dominant in language ability, with the remainder classified as having bilingual ability. However, only one-third of respondents exposed mostly to English were considered to be English dominant in ability, while over half were bilingual in terms of ability.

Not surprisingly, both language dimensions and other facets of acculturation were strongly related to place of schooling (Table II). Three-quarters of respondents who had been educated in their home country rated themselves Spanish dominant in language ability, while those educated in the United States were predominantly bilingual (61%) with a substantial share English dominant (32%). In terms of language exposure once in New Jersey, persons educated in their home country were far more likely to be in bilingual or mostly Spanish-speaking contexts, and far less likely to be in mostly English-speaking contexts than those educated in the United States. Respondents who received their schooling in their home country were more likely to have lived less than 10 years in the United States, to have less than a high school education, and to be older than those educated in the United States.

Language and AIDS Knowledge

In order to assess which dimension of language has the stronger association with AIDS knowledge,

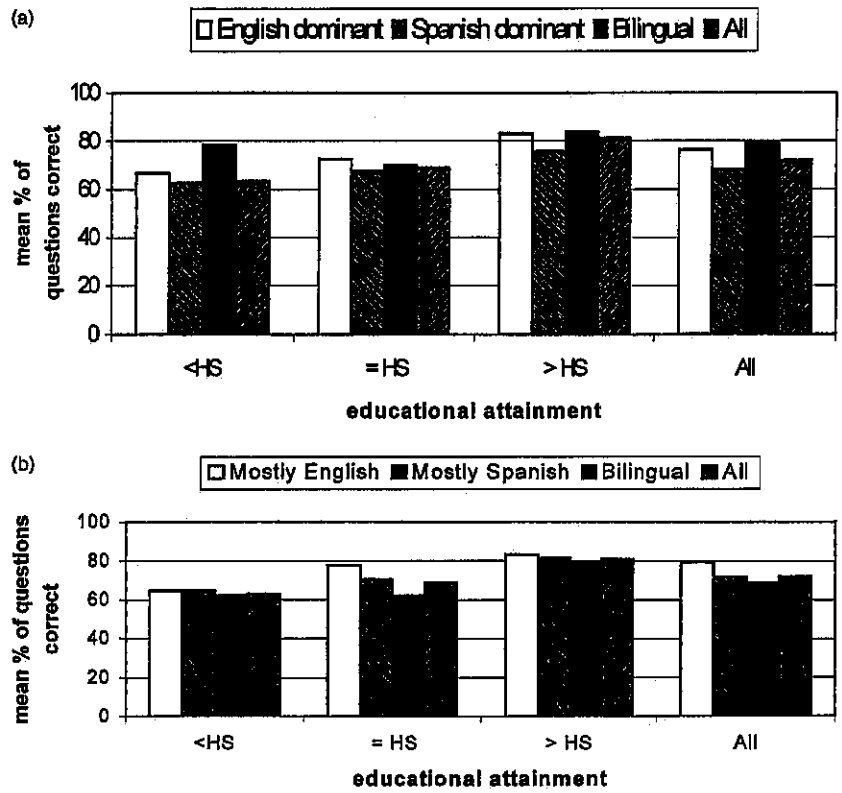

Fig. 1. (a) Mean percentage of AIDS knowledge questions correct, by language ability and educational attainment, New Jersey Latino adults, 2000; (b) mean percentage of AIDS knowledge questions correct, by language exposure and educational attainment, New Jersey Latino adults, 2000.

Fig. 1 presents the mean percentage of AIDS questions answered correctly, according to language ability (Fig. 1(a)) and language exposure (Fig. 1(b)). Each figure also compares knowledge within educational attainment groups, in order to observe whether differences in socioeconomic status explain differences across language groups.

For the sample as a whole as well as in two of the three educational attainment groups, the bilingual ability group scored as well as or better than those who were English dominant, and both groups scored better than Spanish dominant speakers ($p < 0.01$; Fig. 1(a)). For persons with less than a high school education, the bilingual ability group outscored the English dominant group by nearly 10 points, and outscored the Spanish dominant group by more than 15 points. In contrast, for the sample as a whole and at every level of educational attainment, respondents who reported mostly English language exposure scored the highest of the three language exposure groups, followed by the mostly Spanish exposure and bilingual exposure groups ($p < 0.02$ for all education levels combined; Fig. 1(b)).

Among those who spoke either predominantly Spanish or predominantly English, AIDS knowledge increased with increasing educational attainment ($p < 0.01$; Fig. 1(a)). In the Spanish dominant ability group, for example, persons who did not complete high school answered on average 63% of the AIDS knowledge questions correctly, compared to 69 and 81% among high school graduates and those with at least some college education, respectively. Among bilingual speakers, persons with less than a high school education performed better than those with a high school degree (78 and 70% of questions correct, respectively), while those with at least some college performed the best (84%); these differences were not statistically significant at conventional levels. Comparison of these results with those of a 1998 written survey of AIDS knowledge among English and Spanish speaking Latinos (14) shows that in most cases, AIDS knowledge scores were

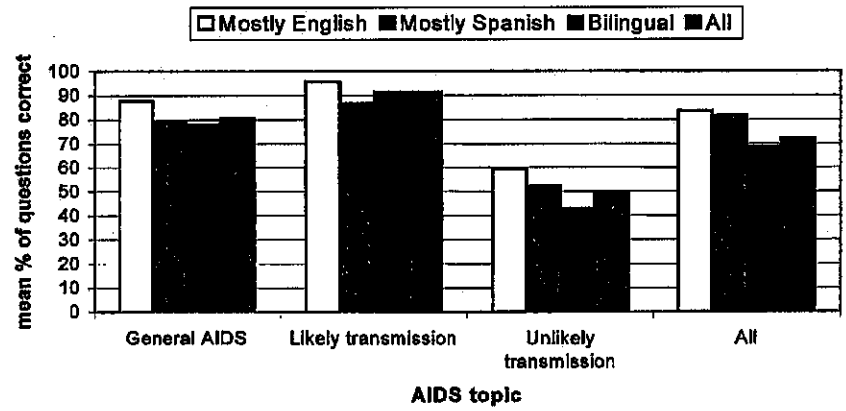

Fig. 2. Mean percentage of AIDS questions correct, by language exposure and AIDS topic.

higher in the telephone survey sample than on the written survey sample. This pattern held true for both language groups and at all levels of educational attainment.

In terms of the different facets of AIDS knowledge, all three language groups performed better on items pertaining to ways HIV is likely to be transmitted than on general AIDS knowledge or on ways the virus is unlikely to be spread (Fig. 2). Overall, respondents correctly answered on average 91% of questions about ways HIV is likely to be transmitted, compared to 81% of general AIDS questions and only 49% of questions about ways HIV is not likely to be spread. Respondents who were predominantly exposed to English in their everyday lives scored the best in all topic areas, while those exposed to both Spanish and English scored the worst in all areas except "likely transmission modes" ($p = 0.08$ for differences across language exposure groups in general AIDS, likely transmission and unlikely transmission). The average score for both "mostly English" and "mostly Spanish" exposed persons was just over 80% of all AIDS questions correct, compared to an average of only 69% correct among the bilingual exposed group ($p < 0.01$).

Multivariate Models of AIDS Knowledge

Because acculturation and socioeconomic status are correlated with one another, multivariate logistic regression was estimated in order to assess the respective roles of each of those factors on chances of failing the AIDS knowledge test. Due to high correlation among the language indicators and among the measures of country of residence, exploratory work was conducted to identify a single measure of each prior to estimating the multivariate model. Language exposure was more strongly related to AIDS knowledge than language ability, and place of schooling was the dimension of country of residence that was most strongly related to AIDS knowledge (Table III). The

Table III. Estimated Odds Ratios of Failing the AIDS Knowledge Test,[a] by Acculturation and Socioeconomic Status, Latino Adults, New Jersey, 2000

	Odds ratio	*p* value
Educational attainment		0.03
<High school	5.46	0.01
High school	2.80	0.09
(>High school)	(1.00)	
Place of schooling		0.24
(U.S.)	(1.00)	
Home country	3.09	0.15
Both United States and home country	4.30	0.14
Language exposure		0.05
(Mostly English)	(1.00)	
Mostly Spanish	0.35	0.24
Bilingual	1.90	0.36
Years in United States		0.18
<5	0.43	0.57
5–9	2.38	0.29
10–14	3.58	0.17
15–19	0.44	0.33
(20 or more)	(1.00)	
Age group (years)		0.49
(18–29)	(1.00)	
30–49	0.90	0.88
50 or older	1.96	0.42
Gender		
Male	2.30	0.11
(Female)	(1.00)	
−2 log likelihood	145.1	0.00

[a] "Failing" = less than 70% of the 17 AIDS knowledge questions correct.

logistic regression model of failing the test included controls for language exposure, country of schooling, educational attainment, age group, gender, and years in the United States.

Educational attainment was the single strongest predictor of odds of failing the AIDS knowledge test. Respondents who had not completed high school were considerably more likely to fail the test than those with at least some college (odds ratio (OR) = 5.46). The OR of failure for respondents with a high school diploma but no college was 2.80 ($p < 0.09$).

Although the OR for each language exposure group alone was not statistically significant, taken together language exposure was significantly associated with chances of failing the test. Respondents who received most of their schooling in their home country or in both their home country and the United States were three to four times as likely as those educated solely in the United States to fail the test, although the effects did not reach conventional levels of significance ($p < 0.15$). Number of years in the United States, age group, and gender were not significant predictors of odds of failure.

DISCUSSION

Consistent with previous findings on AIDS knowledge among Latinos (5, 12, 35), socioeconomic differences accounted for much of the gap between English and Spanish speakers. Our findings showed that the predominant determinant of AIDS knowledge among Latinos was educational attainment. Persons who had at least some college were considerably more likely to have a good grasp of AIDS information. Bilingual exposure was associated with poorer performance on the AIDS knowledge test, but self-assessed language ability, country of origin, place of birth, and length of time spent in the United States were not statistically significantly related to AIDS knowledge when educational attainment was controlled in a statistical model. Previous research has also shown that educational attainment is a critical determinant of AIDS knowledge, but has not controlled for effects of other factors such as language (21, 36).

Interestingly, persons who rated their English and Spanish speaking abilities as comparable (classified bilingual language ability) scored the best of all language ability groups, followed closely by the English dominant ability group. In contrast, the bilingual language exposure group fared the least well of all language exposure groups. The apparent discrepancy between these findings may be because someone who is equally proficient in both languages could learn information about AIDS regardless of the language in which it was presented. On the other hand, if someone is exposed to information in both languages but does not speak one of them well, they might not learn the AIDS information that was conveyed in their weaker language. In other words, bilingual exposure did not appear to confer any advantage over exposure in only an individual's dominant language unless that individual was proficient in both languages.

We show that persons who received their education in their home countries or in both their home country and in the United States were far less likely to have a good command of information about AIDS, and that this association remained even when differences in age, educational attainment, language ability, and language exposure in the United States were taken into account.

There are several limitations to this study. First, the response rate was somewhat lower than is typical of a telephone survey of Latinos, hence the sample may not be representative of New Jersey Latinos. High residential mobility among Latinos may have contributed to the high percentage of sampled telephone numbers that did not reach an eligible respondent (34). Second, recent immigrants may have been less likely than others to be included in the list of telephone numbers. Third, the use of telephone interviews means that households without telephones were excluded from the sample. The study sample has a higher representation of poor English-speakers than the 1990 Census figures suggest. Among respondents who reported that they spoke Spanish well or very well, 31% assessed their English-speaking ability as "very good," 18% as "good," and 52% as "fair or poor," compared to Census estimates of 45% "very well," 23% "well," and 31% "not well or not at all." In part, these differences may reflect the substantial changes in the Latino population of New Jersey that have taken place since the last Census (29). Finally, the small sample size limited the statistical power of the analysis; factors such as country of schooling might have been statistically significant with a larger number of respondents.

CONCLUSIONS

This study demonstrates the need for AIDS information among recently immigrated Latinos, and by implication other recent immigrant groups as well.

Given the ongoing influx of Latinos into the United States, dissemination of AIDS information to this group is critical. At the same time, this research indicates the importance of improved HIV/AIDS education in Latino's countries of origin. The substantial share of Latinos for whom English is not their primary language clearly underscores the need to translate AIDS information into Spanish. Moreover, the lower average educational attainment of Spanish speakers, particularly those educated in their home country, reinforces the point that AIDS information must be designed for persons with less than a high school education.

Future research needs to examine how immigrant Latinos prefer to obtain their information about health, broadly, and HIV and AIDS, specifically. Collaboration with Latino and community groups will also be essential in order to develop messages that are culturally, linguistically, and educationally appropriate for the diverse Latino population.

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