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## Distinct Beliefs, Attitudes, and Experiences of Latino Smokers: Relevance for Cessation Interventions

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### Abstract

**Purpose**—Determine the extent to which Latino smokers are using effective interventions for smoking cessation, with particular focus on nicotine replacement therapy (NRT). Related aims were to explore cultural, attitudinal, knowledge, and socioeconomic variables associated with treatment use.

**Design**—Cross-sectional telephone survey of two groups of Colorado adult smokers: Latinos (n = 1010) and non-Latino whites (n = 519).

**Setting**—Colorado.

**Methods**—Computer-assisted telephone survey in either Spanish or English. Survey addressed sociodemographic variables; smoking and cessation history; knowledge, attitudes, and beliefs about smoking and quitting; and experiences in and attitudes toward the health care setting.

**Participants**—Latino and non-Latino white adult Colorado residents who reported being regular smokers.

**Results**—Colorado Latinos report using NRT substantially less often than do non-Latino whites residing in the state. This and other differences in the study were more pronounced in Latinos characterized as low acculturation on the basis of a language preference variable. Latinos smoke somewhat less than non-Latino whites and report lower levels of dependence. They appear to be motivated to quit but endorse attitudes and beliefs antithetical to NRT use. Health care access was lower among Latinos, and this was related to lower reports of lifetime NRT use. Receipt of recommended practitioner intervention (the “five As”) did not differ by ethnicity.

**Conclusions**—Results suggested that use of effective cessation interventions among Latinos may be enhanced by education about nicotine addiction and NRT. Policy change to increase health care access also showed promise.

### Keywords

Cigarette Smoking; Hispanic Americans; Culture; Acculturation; Smoking Cessation; Prevention Research

## INTRODUCTION

Smoking remains the leading preventable cause of death in the United States, killing more than 430,000 each year.<sup>1</sup> The overall smoking prevalence among adults is estimated at 20.8% by the National Health Interview Survey.<sup>2</sup> In Colorado, the site of the present study, the overall rate (19.9%) is slightly lower.<sup>3</sup> A consistent finding of adult smoking prevalence surveys is that women smoke less than men (men, 23.9%; women, 18.0%), an effect that is more pronounced among Latinos (Latino men, 20.1%; Latina women, 10.1%).<sup>1</sup> Other consistent correlates of smoking are income and education<sup>1,4-7</sup> and acculturation.<sup>8</sup> It has been repeatedly observed that Latinos smoke fewer cigarettes per day than non-Latino whites.<sup>1,9</sup> We use the term “Latino” to refer to persons of Latin American descent living in the United States. The country of origin for most U.S. Latinos is Mexico, but significant numbers originate from Cuba, Puerto Rico, and Central and South American countries.

Despite relatively low levels of smoking among Latinos, the health and economic tolls of their smoking are well known and amply documented. The large size (estimated at 38.5 million in 2002) and fast growth of the U.S. Latino population makes the harm especially important. From 1990 to 2000, the Latino population increased by more than 57%, whereas the total population increased by 13%. This trend has continued in the current decade and is projected to persist. Since 1980, approximately half of the Latino population growth is due to migration and half to domestic increases. Latinos comprise several distinct subgroups, with those of Mexican origin being the largest—58.5% in the 2000 census.<sup>10</sup>

In a comprehensive review of the literature on smoking cessation interventions in U.S. racial/ethnic populations, Lawrence et al.<sup>11</sup> concluded that there is a lack of evidence that treatments recommended in the Public Health Service Clinical Practice Guideline<sup>12</sup> are effective. The need for adapting interventions for Latino populations has been voiced repeatedly,<sup>13-17</sup> yet significant gaps in requisite knowledge remain, particularly in the areas of Latino tobacco use patterns and correlates, their use of and attitudes toward cessation aids, the role of cultural variables in both tobacco use and cessation, and their experience with the health care system. Extant findings are often limited by use of unrepresentative or convenience samples. The interactive effect of gender and acculturation on smoking rates—increased smoking prevalence among Latinas with increasing acculturation but relatively little change in Latinos—has been repeatedly shown, but the reasons for this are unknown.<sup>8,18-20</sup>

Although nicotine replacement therapies (NRTs) have been shown to be effective in enhancing smoking cessation rates in the general population,<sup>12,21</sup> less evidence is available for their use with Latinos<sup>22</sup>; however, one trial of transdermal nicotine with this population demonstrated early cessation rates comparable to those typically achieved with nonminority participants.<sup>23</sup> Other evidence suggests that Latino smokers attempting to quit use NRTs less than white non-Latino smokers, a finding not readily attributable to unequal access.<sup>24,25</sup> Among the factors that have been implicated in underutilization of NRTs in the general population are doubts about efficacy, particularly in comparison with unaided methods of quitting<sup>26-29</sup>; concern about potential side-effects<sup>30-32</sup>; concern about addiction to nicotine<sup>26,27,30</sup>; and misconceptions about the role of nicotine in tobacco-related health problems.<sup>26,27,33-37</sup> The extent to which these factors may explain Latino underuse of NRT is not known.

Several distinctive Latino cultural values have been identified as having potential for understanding this group’s smoking behavior. Among those most consistently implicated are values related to a collectivist cultural orientation: *familismo* (family orientation), *simpatia* (harmonious social relations), *respeto* (respect for authorities such as physicians and clerics),

and *personalismo* (an orientation toward people over ideas and abstractions). By emphasizing protection of other family and community members and the importance of antismoking views of physicians, these values are clear strengths that show promise for crafting tailored interventions. Also implicated has been an attitude commonly attributed to Latinos: *fatalismo* (fatalism).<sup>14–16,38–40</sup> By minimizing the sense of personal control over health and longevity, this attitude complicates efforts to motivate behavioral change in tobacco use.

There is evidence that Latino smokers experience lower levels of practitioner intervention in the health care system. Data from the 2000 National Health Interview Survey indicate that Latinos are significantly less likely than both non-Latino whites and non-Latino blacks to report receipt of physician advice to stop smoking.<sup>41</sup> This study also found that this pattern of lower rates of intervention has remained consistent from the preceding decade. The disparity is particularly important in light of the consistent finding that even brief physician advice increases the probability of quitting by as much as 2.5% relative to no advice/usual care.<sup>12</sup> There are yet more fundamental obstacles to care of Latino smokers in the health care system. This group has the highest rate of being uninsured of all racial/ethnic groups. The general disparity was consistently found within Latino subgroups (Puerto Rican, Mexican, and “other Hispanic”).<sup>42</sup> Socioeconomic disadvantage is related to differences in physician provision of assistance with quitting, but the mechanisms involved are unknown.<sup>43</sup> The possibility that Latino smokers may perceive bias in treatment owing to their ethnicity has been largely unexplored.

The goals of the present research were to (1) characterize the smoking patterns, level of dependence, and cessation motivation of Latino smokers in relation to non-Latino white smokers in a state with a large Latino population; (2) determine levels of use of recommended smoking cessation treatments among these groups; and (3) investigate the extent to which NRT use patterns may be related to beliefs and attitudes, access to health care, and experiences with the health care system. This study examined the extent to which Latino smokers are using effective interventions for smoking cessation, with particular focus on NRT. Related aims were to explore cultural, attitudinal, knowledge, and socioeconomic variables associated with treatment use.

## METHODS

### Design

Respondents completed a computer-assisted telephone survey that included standard measures of sociodemography and smoking history, as well as items derived from prior research on culturally based attitudes and beliefs about smoking and cessation. The survey was translated into Spanish and pilot-tested on focus groups. Problematic items were refined and retested. The average time to complete the survey interview was 23.3 minutes.

The survey sampled the five Colorado regions constituting the Latino Statewide Tobacco Prevention and Education Network and was conducted from March through October 2006. These five regions contain 95% of Colorado Latinos (as well as a comparable proportion of the overall Colorado population) and form geographically distinct population subclusters. The target sample size of 1000 Latinos and 500 non-Latinos was set to meet the requirements dictated by power analyses and to allow for Latino/non-Latino comparisons. The preliminary sampling strategy was to sample Latinos and non-Latinos within each region according to each group’s regional proportion of the five-region population total for each group. To reach a sample size adequate for region comparisons, it was necessary to oversample two low-population regions (two rural regions in the south and west of the state) and undersample region five—the most populous of the Colorado regions, an area including

the Denver/Boulder area. The region north of this metropolitan area was slightly oversampled, and the region to the south was slightly undersampled to obtain similar numbers of Latinos in these two regions.

## Sample

The sampling method took three forms. First, random-digit dialing (RDD) was used to reach 519 non-Latino white smokers, a number slightly higher than the target. In addition, 111 Latino smokers found during the screening process used in this RDD were interviewed. Second, a Spanish surname listed sample was used to reach Latino smokers more efficiently. This produced 819 completed interviews. Third, RDD screening for Latino smokers produced another 80 respondents. This produced a total of 1010 completed Latino surveys.

Of the three methods used to find respondents—RDD for both Latinos and non-Latinos, Spanish surname-listed sample, and RDD for Latinos exclusively—the general RDD method produced the highest response rate. Across the five regions, between 63% and 75% of eligible smokers agreed to do the interview. The other two methods, focusing only on Latino smokers, had lower response rates; the mean for the Spanish surname-listed sample was 36%, and that for the Latino-only RDD sample was 42%.

## Measures

Participants reported their gender, age in years, and race. Educational level was assessed categorically, by highest level of education completed; categories included kindergarten only or never attended school, grades 1 to 8 (“elementary”), grades 9 to 11 (“some high school”), grade 12 or general equivalency diploma completed (“high school graduate”), 1 to 3 years of college or technical school (“some college/technical school”), 4 or more years of college (“college graduate”), and MA/MS/PhD or higher (“graduate school”). Marital status categories were married, divorced, widowed, separated, never married, and member of an unmarried couple. Categories used for employment status were employed for wages, self-employed, out of work for more than 1 year, out of work for less than 1 year, homemaker, student, retired, and unable to work. Household income was assessed categorically with eight response options ranging from less than \$10,000 to greater than \$75,000 per year.

Several items addressed nativity and residency. These included country of birth of the participant and the participant’s parents; country or region with which Latino respondents most closely identify; time lived in the United States, in Colorado, and at the current address; zip code; place of immediate prior residence; and time living at that location.

Language acculturation was measured using language items from the Short Acculturation Scale for Hispanics.<sup>44</sup> The four selected items assess language preference when reading and speaking, when thinking, when at home, and when with friends. Response options, scored on a one to five scale, are “only Spanish,” “more Spanish than English,” “both equally,” “more English than Spanish,” and “only English.” This language-based measure has good reliability and validity as an index of acculturation, performing almost as well as broader measures of the construct.<sup>45,46</sup>

Participants reported their age of initiation of regular smoking, number of cigarettes smoked per day, number of days smoking during the prior 30 days, and whether they smoke more on weekends and holidays. They also completed the Fagerstrom Test for Nicotine Dependence<sup>47</sup> (FTND). To address level of motivation to quit smoking, the Stages of Change (SOC) measure was used,<sup>48,49</sup> as well as an item addressing the importance of quitting, rated from one (not at all important) to five (extremely important). A four-point scale ranging from “very confident” to “very unconfident” was used to measure confidence

in the ability to refrain from smoking for at least 1 month. An estimate of the total number of quit attempts lasting at least 1 week was also obtained.

Culturally based items in this set were informed by prior research about the role of distinctive Latino attitudes and beliefs in their smoking patterns.<sup>15,16</sup> These were presented in randomized order using a five-point Likert format (“strongly disagree” to “strongly agree”). Dimensions included fatalism about the prospect of dying from smoking (two items), estimates of the addictiveness of smoking (two items), safety of low-level smoking (one item), and moral and characterologic aspects of smoking related to strength or weakness of character (four items). Two items addressing smoking as a means to control appetite and weight, one assessing smoking as a social facilitator, and three tapping family influence in motivating cessation are not included in this report. The same five-point Likert format described previously was used to obtain ratings of the helpfulness of NRT, assess agreement with statements about related hazards of NRT (health effects, addictiveness), and tap concerns about NRT expense. Estimates of helpfulness, efficacy, and availability of several other cessation aids and methods were also obtained; results are not included in this report.

Participants reported whether they had used a broad variety of cessation aids and methods in the past. The present report focuses only on responses to the question about prior use of NRT. Data were collected about each of several methods of delivering nicotine (patch, gum, lozenge, inhaler, nasal spray), but these are combined into a single NRT-use category for present purposes. (Use of methods other than patch and gum was too infrequent to provide adequate power for analyses.)

Participants were asked whether they had health insurance coverage (and the name of the insurer) and whether they had both a usual place to go for help with health concerns and a person they identified as their doctor or health care provider. They also rated their health status (excellent to poor), estimated the total number of ambulatory care visits in the past year and the time since their most recent visit, and indicated whether their health insurance helped pay for cessation medications and counseling. Another set of questions asked participants to report on whether they had in the past year received each of the recommended practitioner interventions for smoking cessation (“five As”: ask, advise, assess, assist, arrange follow-up).<sup>12</sup> Two accessory “five A” items developed for this research were also included. These addressed whether the participant acted upon practitioner advice to quit and whether the practitioner explained how NRTs work. Three items assessed potential barriers associated with receiving services in the health care system: language difficulties, lack of trust, and concern about differential treatment owing to ethnicity.

## Analysis

Data were analyzed using SPSS version 17 software. Univariate analyses were performed to yield descriptive statistics for the study populations. Bivariate associations of categorical variables were tested via the  $\chi^2$  statistic, and *t*-tests were used for continuous variables. Odds ratios (ORs) and 95% confidence intervals (CI) for “ever use” of NRTs were generated using logistic regression.

## RESULTS

### Sociodemography

Most Latinos (66.0%) were born in the United States. Consistent with U.S. Census data for Colorado, the largest segment of foreign-born respondents were from Mexico (29.7%). Correspondingly, 29.1% of Latinos completed the interview in Spanish. The remainder reported nativity in a variety of Central or South American countries, Cuba, or Puerto Rico.

Following the strategy of the scale originators,<sup>44</sup> we categorized Latino smokers into either low language acculturation (44.7%) or high language acculturation (55.4%) groups. Low acculturation was defined as using Spanish exclusively, mostly, or as much as English; high acculturation was defined as using English mostly or exclusively. We intend this definition as a proxy for the complex construct of acculturation, perhaps the best single item for this purpose. A virtue of this method is that it can be easily used by practitioners interested in availing themselves of its treatment implications.

As shown in Table 1, the Colorado Latino sample was younger than the non-Latino group: Latino mean, 41.8 years, SD, 13.8 years; non-Latino mean, 47.1 years, SD, 14.2 years,  $p < .001$ . An age difference also appeared for comparison of Latino acculturation groups (low acculturation mean, 40.7 years, SD, 13.2 years; high acculturation mean, 42.6 years, SD, 14.1 years,  $p < .05$ ). The Latino group had a lower proportion of women (44.9%) than the non-Latino group (60.9%); this effect was particularly pronounced among low-acculturation Latinos (35.3% women) relative to high-acculturation Latinos (52.6% women), perhaps reflecting a higher male immigration rate. Both comparisons were significant at  $p = .001$ .

Based upon an examination of distributions, the original education variable was recategorized into four groups: less than high school, high school graduate, some college, and college graduate or beyond. This variable was also analyzed as a dichotomy: high school or less and beyond high school. Data for the dichotomy alone are presented in Table 1. Although the Latino respondents represented all levels of educational attainment, substantially more reported low levels of education relative to non-Latinos and substantially fewer at the higher levels ( $p < .001$ ). For example, 34.9% of non-Latinos never completed high school, compared with 6.8% of non-Latinos. The distribution of non-Latino education was distinctly skewed toward higher attainment. Approximately 60.8% of non-Latinos attended or graduated from college, compared with 32.1% of Latinos ( $p < .001$ ). The disparity in educational achievement was particularly apparent in examining the low-acculturation Latino group; more than half reported not graduating from high school.

The Latino sample reported considerably lower income than did non-Latinos. The highest income category ( $\geq \$50,000$ ) contains almost twice as many non-Latinos (38.4%) as Latinos (19.6%) ( $p < .001$ ). Conversely, the lowest category ( $< \$25,000$ ) contains roughly twice as many Latinos (48.9%) as non-Latinos (27.6%) ( $p < .001$ ). A mean income estimate was derived by using the midpoint of the income categories and the respective proportions in these categories. This too revealed a substantial income disparity, exceeding \$15,000 ( $t[1374] = 9.49$ ;  $p < .001$ ).

Differences by ethnicity in employment were not large but showed some advantage for non-Latinos. Although the distributions by ethnicity differed significantly across categories, these gaps seldom exceeded 5%. The sole exception was that non-Latinos were more likely to be retired, a finding consistent with the older age of this group. Latinos are marginally more likely to be unemployed than non-Latinos (data not shown).

The original marital status variable was collapsed into a dichotomy (married vs. not married). Similar proportions of Latinos (47.9%) and non-Latinos (48.0%) reported being married. The overall Latino proportion masks significantly different proportions by acculturation classification: 56.7% of low-acculturated Latinos reported being married, compared with 40.6% of high-acculturated Latinos ( $p < .001$ ).

### Smoking History

Non-Latinos reported smoking significantly more cigarettes per day (mean, 16.2; SD, 9.1) than did Latinos (mean, 11.0; SD, 8.6). The reported daily smoking rate among highly



acculturated Latinos was greater than that of low-acculturated Latinos: mean, 12.3; SD, 8.8 vs. mean, 9.5; SD, 8.2. Both differences were significant at  $p < .001$  (Table 2).

The number of years smoking was indexed both as a continuous variable and as a dichotomy (0–10 and  $\geq 11$  years). In each case, non-Latinos reported more years of smoking than did Latinos. The mean difference between non-Latinos and Latinos was 5.5 years ( $t[1501] = 5.90$ ;  $p < .001$ ), corresponding to their mean difference in age (5.3 years); similarly, the distribution in the dichotomy was more heavily skewed toward greater smoking duration among non-Latinos ( $p < .001$ ). Highly acculturated Latinos reported more years of smoking than low-acculturated Latinos, a mean difference of 1.8 years ( $t[989] = 2.07$ ;  $p = .04$ )—again consistent with the mean difference between these groups in age (1.9 years).

Latino smokers reported lower levels of dependence as measured by the FTND than did their non-Latino counterparts: Latino mean, 2.70, SD, 2.27; non-Latino mean, 3.75, SD, 2.30,  $p < .001$ . Corresponding differences were observed in the comparison between low-acculturation and high-acculturation Latinos, although to a lesser degree (low-acculturation mean, 2.49, SD, 2.17; high-acculturation mean, 2.87, SD, 2.34,  $p = .02$ ). On the FTND item assessing latency to the first cigarette of the day (“time to first cigarette” [TTFC]), the modal response among Latinos was “60 minutes or more” (47.5%); for non-Latinos, it was “6 to 30 minutes” (40.1%). Non-Latinos predominated over Latinos in the two shortest smoking latency categories (6–30 minutes and  $\leq 5$  minutes): 63.8% of non-Latinos versus 38.4% of Latinos ( $p < .001$ ). A parallel trend was observed in comparing acculturation subgroups of Latinos; highly acculturated Latinos reported relatively shorter latencies to smoking than did low-acculturated participants ( $p = .002$ ). Multiple items were included in the survey to assess readiness to attempt cessation, one of these a behaviorally based index (results not tabled). A significantly higher proportion of Latinos (57.6%) than non-Latinos (47.7%) reported a quit attempt lasting at least 1 day in the past 12 months ( $p < .001$ ).

The “confidence in ability to quit” (for  $\geq 1$  month) variable was dichotomized as follows: “unconfident” = “very unconfident” and “somewhat unconfident” response options; “confident” = “somewhat confident” and “very confident” response options. Latino smokers were more confident in their ability to quit than were non-Latinos: 62.7% Latinos versus 57.4% non-Latinos ( $\chi^2_1=4.01$ ;  $p < .05$ ). High-acculturation Latinos were more confident than low-acculturation Latinos (65.9% high acculturation vs. 58.6% low acculturation [ $\chi^2_1=5.6$ ;  $p = .02$ ]). Analyses of the continuous version of this variable revealed the same pattern.

Level of cessation motivation was assessed by asking respondents how important it was for them to quit. A total of 60.9% of Latinos rated quitting as “quite a bit” or “extremely” important, compared with 49.5% of non-Latinos. Chi-square analysis of this five-item scale was significant ( $\chi^2_4=19.47$ ;  $p < .001$ ). A significantly greater proportion of Latino smokers (29.3%) placed in the highest level of the SOC continuum relevant to this sample (“preparation”) than did non-Latinos (16.4%). Chi-square analysis of the three-level SOC variable (precontemplation, contemplation, and preparation) produced a statistically significant result ( $\chi^2_2=25.39$ ;  $p < .001$ ). Relative to high-acculturation Latinos, a larger proportion of low-acculturation Latinos were in the highest SOC category (38.4% low acculturation vs. 22.9% high acculturation). Again, the overall  $\chi^2$ —here confined to the two Latino acculturation groups—was significant ( $\chi^2_2=23.8$ ;  $p < .001$ ).

## NRT Use by Sociodemographic and Smoking History Variables

The predominant finding about NRT use was the extent to which it varied as a function of both ethnicity and acculturation. Non-Latinos reported lifetime use of NRT at twice the rate of Latinos (53.3% vs. 26.7%;  $p < .001$ ). This disparity was seen among Latino acculturation groups as well, although to a lesser degree: 30.5% of highly acculturated Latinos reported lifetime use of NRT compared with 21.7% of low-acculturation Latinos ( $p < .01$ ). The OR for NRT use as a function of ethnicity was .32 (95% CI, .25–.41;  $p < .001$ ), documenting again the lower rates of NRT use among Latinos. The odds of NRT use among highly acculturated Latinos was significantly greater than that for low-acculturated Latinos (OR = 1.59; 95% CI, 1.15–2.20;  $p < .01$ ).

In Table 1, the ORs show the odds of one group using NRT relative to the reference group. Over the total Latino sample, women were more likely than men to report having used NRT (OR = 1.74; 95% CI, 1.27–2.39;  $p = .001$ ). This effect was most pronounced in low-acculturation women (OR = 1.94; 95% CI, 1.14–3.28;  $p = .014$ ). No corresponding gender effect was observed among non-Latinos. Among non-Latinos, age had no effect on reported history of NRT use in logistic regression analyses using age in five categorical groupings (related data not shown) or as a dichotomy. Among Latinos as a whole, each of the three age groups beyond 34 years were more likely to report NRT use relative to the youngest age group (18–24 years;  $p < .05$ ). In separate logistic analyses by acculturation group, this age effect held only for the 35 to 44 years and the 55 to 84 years groups and only for highly acculturated Latinos ( $p < .05$ ). The logistic analyses by age dichotomy showed no effect for non-Latinos and significant effects for Latinos overall ( $p < .001$ ), as well for both acculturation groups separately (low acculturation  $p = .04$ ; high acculturation  $p = .002$ ).

Educational level had no effect on reported NRT use among non-Latinos using either a four-level grouping or a dichotomy (“high school or less” vs. “beyond high school”). Among Latinos overall, those who had graduated from college were more likely to report NRT use, but this effect was significant only for the low-acculturation group (OR = 2.88; 95% CI, 1.19–6.97;  $p = .011$ ). Analysis of the education dichotomy showed a significant effect only for the Latino group as a whole, with education beyond high school associated with increased odds of NRT use (OR = 1.53; 95% CI, 1.10–2.12;  $p = .01$ ).

No effects of income on NRT use were observed in non-Latinos or Latinos or within Latino acculturation group. Similarly, no effect of marital status on reported NRT use was found in non-Latinos, Latinos overall, or low-acculturation Latinos. Among highly acculturated Latinos, being married was associated with increased odds of NRT use (OR = 1.51; 95% CI, 1.01–2.27), a marginally significant finding ( $P = .04$ ).

Table 2 shows OR coefficients for NRT users vs. nonusers in regard to smoking history. Because more than 90% of Latinos, irrespective of acculturation group, reported smoking 20 or fewer cigarettes per day, a dichotomous variable producing more balanced distributions was used for logistic analyses: 10 or fewer cigarettes versus 11 or more. In all groups, and within acculturation groups, the ORs for reported NRT use for the “11 or more” group relative to the “10 or fewer” group were significant (OR = 1.70–2.93; all  $p < .05$ ). These effects were consistent across groups for the continuous measure of daily smoking rate (OR = 1.04–1.05; 95% CI, 1.01–1.08; all  $p < .01$ ). Among Latinos, significant effects of smoking duration on reported NRT use were observed for all relevant measures (all  $p < .05$ ). In non-Latinos, significant effects were found only in analyses of the dichotomous variable (OR = 1.52; 95% CI, 1.00–2.29;  $p < .05$ ). The strong, consistent, and significant trend across all groups was for decreasing latency to the first cigarette of the day (indexed by TTFC, a measure of dependence) to be associated with increased OR for NRT use. This trend was



stronger for Latinos than non-Latinos (Latino OR = 2.69–3.40;  $p < .001$ ) and was generally stronger for both Latino acculturation groups relative to non-Latinos (Table 2).

The general trend across all groups was for confidence in ability to quit smoking to be associated with lower ORs for NRT use (OR range = .50–.75). This effect only reached significance for the Latino group as a whole (OR = .60; 95% CI, .44–.83;  $p < .01$ ) and for high-acculturation Latinos (OR = .50; 95% CI, .33–.76;  $p < .001$ ). Self-reported importance of quitting (analyzed as a dichotomy) was significantly associated with increased odds of NRT use among non-Latino subjects (OR = 1.34; 95% CI, 1.14–1.56;  $p < .001$ ). To a lesser degree, this effect was also observed in the Latino group as a whole (OR = 1.17; 95% CI, 1.02–1.34;  $p < .05$ ). Only in high-acculturation Latinos did this reach significance (OR = 1.22; 95% CI, 1.04–1.44;  $p < .05$ ). Among non-Latinos, the OR for the effect “preparation” status relative to “precontemplation” status was significant: OR = 3.41; 95% CI, 1.72–6.74;  $p < .001$ . None of the effects of SOC on NRT use was significant at any level for Latino subjects.

### Culturally Based Attitudes About Smoking and Quitting

Fatalistic and generally mistaken beliefs about smoking and quitting were endorsed by substantial proportions of Latino smokers, at significantly higher rates than among non-Latino smokers (Table 3). Disagreement with the statement in these Likert-format items was indexed by combining “strongly disagree” and “somewhat disagree” options; the agreement category in this dichotomy included the “strongly agree,” “somewhat agree,” and “neither agree nor disagree” options. This dichotomization is the same used by Shiffman et al.<sup>50</sup> and Cummings et al.<sup>27</sup> to categorize similar items tapping mistaken beliefs and concerns about NRT.

A higher proportion of Latino smokers (42.7%) than non-Latino smokers (34.0%) agreed with the statement “Whether I die of smoking is in God’s hands, not mine” ( $p = .001$ ). This view was expressed by a larger proportion of low-acculturated Latinos (48.7%) than highly acculturated Latinos (37.7%;  $p = .001$ ). Similarly, 44.7% of Latino smokers, vs. 33.0% of non-Latino smokers agreed with the statement “Quitting smoking at this time wouldn’t affect when I die.” Again, more low-acculturated Latinos (53.3%) than high-acculturation Latinos (38.0%) agreed with this statement. All  $\chi^2 p$  values for tests of the “fatalism” dichotomies by ethnicity and acculturation group were less than .001.

Latinos were more likely than non-Latinos to disagree with the statement “People who smoke cigarettes regularly are addicted to nicotine” (11.0% Latinos vs. 6% non-Latinos;  $\chi^2 p < .01$ ). The difference between low-acculturated Latinos (12.9%) and highly acculturated Latinos (9.5%) was not significant. Latino smokers were more likely to disagree with the statement “I am addicted to cigarettes” than were non-Latinos (20.9% Latinos vs. 8.5% non-Latinos;  $\chi^2 p < .001$ ). Again, the difference between low- (22.8%) and high-acculturation (19.4%) groups was not significant. More Latinos (30.7%) than non-Latinos (23.4%) agreed with the statement “Smoking a few cigarettes on a weekend or on social occasions” is safe ( $\chi^2 p < .01$ ). The difference in agreement between acculturation groups (low, 39.3%; high, 23.8%) was also significant ( $\chi^2 p < .001$ ).

Four items tapped the extent to which groups view smoking and quitting in moral or “characterologic” (related to strength or weakness of character) terms. Again, results are presented for proportions endorsing the response options categorized here as “agree.” For three of these items, Latino/non-Latino differences were approximately 20%: “Cigarette smoking is a moral weakness,” “Quitting smoking is only a matter of will power,” and “Failure to quit is a sign of weakness of character.” In each case, the  $\chi^2 p$  value was less than .001. For the fourth item (“Smoking violates my religious beliefs”), the group

difference was 12.3%, also significant at the .001 level. All differences as a function of acculturation group were significant at the same level, with low-acculturation Latinos consistently endorsing each attitude more strongly. Here, differences ranged from 7.2% to 20.5%.

### **NRT Use by Culturally Based Smoking/Quitting Attitudes**

The sole items in this set to bear upon NRT use were those related to addiction and the item endorsing the view that quitting smoking is simply a matter of willpower. The NRT use OR for all Latinos on the “Smokers are addicted to nicotine” item was significant (OR = 2.18; 95% CI, 1.09–4.35;  $p < .05$ ), as was the OR for highly acculturated Latinos (OR = 2.70; 95% CI, 1.02–7.12;  $p < .05$ ). Effects for non-Latinos and low-acculturated Latinos on this measure were not significant. For the “I am addicted to cigarettes” item, significant effects were seen for both ethnic groups and for the high-acculturation group (OR = 3.30–4.50; all  $\chi^2 p < .001$ ). Self-report of addiction to cigarettes was associated with increased likelihood of NRT use. The willpower (voluntad propia) item (“Quitting smoking is only a matter of will power”) ORs were significant for both ethnic groups and the high-acculturation group (OR = .32–.49). Thus, this belief was associated with a substantially decreased likelihood of reporting prior NRT use.

### **Knowledge, Attitudes, and Beliefs about NRT**

Five items addressed attitudes toward NRT. For the present analyses, these were expressed as dichotomies, consistent with the strategy employed by Shiffman et al.<sup>50</sup> and Cummings et al.<sup>27</sup> using highly similar items (Table 4). This dichotomy was disagree (“strongly disagree” and “somewhat disagree” response options) and agree (“neither agree nor disagree,” “somewhat agree,” and “strongly agree”). The belief that nicotine causes cancer was particularly prevalent, exceeding 81% for all groups. Attitudes not conducive to NRT use were more prevalent in Latinos than non-Latinos. These differences were significant via  $\chi^2$  analysis (all  $p < .001$ ) in three cases: “NRT as bad as cigarettes” (Latino mean, 63.9%; non-Latino mean, 49.1%), “I’d be worried about getting hooked on NRT” (“addictive” in Table 4; Latino mean, 55.4%; non-Latino mean, 35.5%), and “Nicotine causes cancer” (Latino mean, 90.4%; non-Latino mean, 81.1%). Differences as a function of acculturation group were seen on two items: “NRT too expensive” (low acculturation, 52.8%; high acculturation, 62.6%;  $\chi^2 p < .01$ ) and “I would be worried about getting hooked on NRT” (low acculturation, 62.7%; high acculturation, 49.7%;  $\chi^2 p < .001$ ). Highly comparable proportions of participants in all groups (56.8%–59.9%) agreed with the statement “NRT would help me quit smoking.”

### **NRT Use by Knowledge, Attitudes, and Beliefs about NRT**

The belief that NRT causes cancer (including not knowing whether it does), although prevalent, was not associated with significantly decreased odds of reporting prior NRT use. Belief in their potential efficacy was associated with increased odds of reporting prior NRT use for non-Latinos (OR = 1.57; 95% CI, 1.06–2.34;  $p < .05$ ). This effect was seen more prominently in Latinos (OR = 2.00; 95% CI, 1.42–2.83;  $p < .001$ ) and both acculturation groups (low acculturation OR = 2.45, 95% CI, 1.35–4.45,  $p < .01$ ; high acculturation OR = 1.84, 95% CI, 1.20–2.82,  $p < .01$ ). Other effects in this set were somewhat less consistent. The belief that NRT is “as bad as cigarettes” was most prominently associated with decreased odds of reported NRT use in non-Latinos (OR = .46; 95% CI, .31–.68;  $p < .001$ ). For the Latino group as a whole, endorsement of this belief was associated with decreased odds of NRT use (OR = .65; 95% CI, .46–.90;  $p < .05$ ), as was the case for high-acculturation Latinos (OR = .58; 95% CI, .38–.89;  $p < .05$ ). The belief that NRT is too expensive had no effect on odds of reporting prior use among non-Latinos but did for Latinos and the low-acculturation subset, for which it was associated with increased

likelihood of reporting prior use (Latino OR = 1.62, 95% CI, 1.14–2.25,  $p < .01$ ; low acculturation OR = 2.91, 95% CI, 1.63–5.22,  $p < .001$ ). Concern about the addictiveness of NRT was associated with decreased probability of reporting prior use among Latinos (OR = .64; 95% CI, .46–.88;  $p < .01$ ) and high-acculturation Latinos (OR = .60; 95% CI, .40–.94;  $p < .05$ ).

### Health Care System: Attitudes and Experiences

Seven items addressed intervention by the participant's health care provider to assist smoking cessation within the 12 months prior to the survey (Table 5). These questions were restricted to those respondents who reported having at least one health care visit in this time period (59.1% of Latinos and 72.5% of non-Latinos). The results from items addressing the "five As" follow here. Similar proportions in both groups reported being asked by a provider whether they smoke ("ask": Latinos, 75.3%; non-Latinos, 71.4%), were advised to quit ("advise": Latinos, 65.0%; non-Latinos, 63.1%), were assisted by the practitioner in quitting ("assist": Latinos, 31.9%; non-Latinos 35.5%), and were offered follow-up support ("arrange": Latinos, 12.0%; non-Latinos, 9.9%). The only group difference in receipt of the "five As" that reached significance was a gap in report of practitioner inquiry into the participant's interest in quitting ("assess": Latinos, 24.6%; non-Latinos, 35.5%;  $p < .001$ ). Low-acculturation Latinos reported having been asked about their smoking status at higher rates than did high-acculturation Latinos (80.8% vs. 72.1%;  $\chi^2 p < .05$ ). For each of the remaining "five A" items, highly acculturated Latinos reported greater levels of practitioner intervention than did low-acculturated Latinos. In two cases, this effect reached statistical significance: "assess" (28.4% high acculturation vs. 19.8% low acculturation;  $p < .01$ ) and "assist" (35.3% high acculturation vs. 25.8% low acculturation;  $p < .05$ ).

The two accessory "five A" items included in this report both yielded significant effects. Relative to Latinos, non-Latinos were substantially more likely to report that their practitioners explained how NRTs worked (30.3% non-Latinos vs. 18.5% Latinos;  $\chi^2 p < .001$ ). A corresponding difference was observed in comparing highly acculturated Latinos with their low-acculturated counterparts (23.5% high acculturation vs. 12.4% low acculturation;  $p < .001$ ). Latinos were more likely to report having taken practitioner advice to quit than were non-Latinos (45.0% Latinos vs. 32.4% non-Latinos;  $p < .01$ ). The corresponding difference by acculturation group was not significant.

Latino participants reported lower rates of health insurance coverage (56.5%) than non-Latinos (77.7%). Reported rate of health insurance coverage among low-acculturated Latinos was substantially lower (38.7%) than that in highly acculturated Latinos (70.4%). Both of these effects were significant ( $\chi^2 p < .001$ ). This same pattern of greater health care access in non-Latinos relative to Latinos, and in highly acculturated Latinos relative to low-acculturated Latinos, was observed in other related variables; all  $\chi^2$  effects were again significant at the .001 level. Specifically, the difference between ethnic groups on reporting having a single, identified primary health care practitioner was 23.5% (75.8% non-Latinos vs. 52.3% Latinos); acculturation groups differed by 30.4% (65.9% high acculturation vs. 35.5% low acculturation). The ethnic group difference on reporting having a regular place for health care was 16.8% (79.6% non-Latino vs. 62.8% Latino), and the acculturation group difference was 22.2% (72.8% high acculturation vs. 50.6% low acculturation). A total of 72.5% of non-Latinos reported having had a health care encounter in the prior year, compared with 59.1% of Latinos, a difference of 13.4%; the acculturation group difference on this measure was 21.1% (68.6% high acculturation vs. 47.5% low acculturation).

Latinos and non-Latinos were comparably likely to report that they trust their practitioner (76.4% Latinos vs. 79.8% non-Latinos). Fewer low-acculturation Latinos (67.5%) than high-acculturation Latinos (83.3%) reported such trust ( $\chi^2 p < .001$ ). Concerns about ethnic

discrimination in the health care system were reported by 23% of Latinos, more frequently by those with low acculturation (36.7%) than their more highly acculturated counterparts (12.1%). This difference was significant via  $\chi^2$  analysis at the .001 level.

### **NRT Use by Attitudes and Experiences in the Health Care System**

Given the uncertain link between NRT use (ever used NRT) and practitioner intervention during the prior 12 months, logistic analyses are highly speculative. The only one of the “five A” interventions associated with increased OR for NRT use among non-Latinos was “arrange follow-up” (OR = 2.80; 95% CI, 1.16–6.75;  $p < .05$ ). Among Latinos, reports of being assessed for readiness to quit (“assess”) were associated with significantly increased odds of using NRT (OR = 1.82; 95% CI, 1.29–2.57;  $p < .001$ ). This effect was seen in both low-acculturation Latinos (OR = 1.98; 95% CI, 1.10–3.58;  $p < .05$ ) and highly acculturated Latinos (OR = 1.63; 95% CI, 1.06–2.50;  $p < .05$ ). Among Latinos as a group, report of “assist” was associated with increased odds of NRT use (OR = 1.52; 95% CI, 1.02–2.27;  $p < .05$ ). The sole remaining significant effect in this set was a lower OR for NRT use associated with practitioner inquiry into smoking status among low-acculturation Latinos (OR = .38; 95% CI, .17–.86;  $p < .05$ ).

For the supplementary “five A” item addressing practitioner intervention in the form of explaining the mechanism of NRT therapeutic effect, all logistic analyses—by each ethnic group and by acculturation groups separately—showed significant effects. Such reporting was associated with increased odds of reporting ever having used NRT: Latino OR = 2.30, 95% CI, 1.58–3.33,  $p < .001$ ; non-Latino OR = 1.67, 95% CI, 1.10–2.56,  $p < .05$ ; low-acculturation Latino OR = 3.00, 95% CI, 1.54–5.85,  $p < .001$ ; high-acculturation Latino OR = 1.87, 95% CI, 1.20–2.92,  $p < .01$ . For the other accessory “five A” item, addressing whether the participant acted on practitioner advice to quit, the only significant effect was found among non-Latinos (OR = 2.17; 95% CI, 1.19–3.98;  $p < .05$ ).

All variables in the set of health care access measures—having health insurance, having an identified practitioner and a regular place for health care, and having a health care encounter in the prior year—were related to increased odds of NRT use among Latinos as a group. These effects held consistently for both acculturation groups as well, with the sole exception being the health insurance OR for highly acculturated Latinos (OR = 1.23; 95% CI, .77–1.96) had significant effects for both acculturation groups. The ORs ranged from 1.65 to 2.16 among Latinos, 1.93 to 2.17 among low-acculturation Latinos, and 1.64 to 1.89 among high-acculturation Latinos. None of these variables had a significant bearing on NRT use among non-Latinos.

There were no significant effects of reporting either trusting practitioner or concerns about discrimination as a function of either ethnicity or acculturation group.

## **DISCUSSION**

This study replicated prior research documenting low Latino use of effective smoking cessation strategies and explored potential reasons for this disparity. Perhaps the most notable finding was that it may be a mistake to treat Latino smokers, even that subset of largely Mexican origin, as a single homogeneous group. A simple dichotomization by acculturation status, accomplished on the basis of a single language preference item, yielded consistent, distinct, and substantial effects having strong implications for interventions with this population. More language-acculturated Latinos appeared to lie on a continuum anchored at opposite ends by non-Latino whites and less-acculturated Latinos.

The survey sample of Colorado Latino smokers mirrors the diversity in the U.S. population. A strength of the present study was the sampling of diverse geographic subregions of Colorado that, like the United States more generally, vary in Latino population characteristics. The sample included residents of rural areas of south central and western Colorado as well as residents of urban areas of the Front Range, and it included long-term Latino residents as well as recent immigrants. Relative to non-Latino white smokers, Latino smokers were younger, were more likely to be male, and had lower levels of both educational achievement and income. Although the Latino population is widely known to be heterogeneous, a contribution of the present study is that much of this heterogeneity can be captured by a single variable—acculturation, at least as indexed by the simple measure of preferred language for reading and speaking. This generalization applies to Latinos of Mexican ancestry, a group constituting the majority of the U.S. Latino population.

The present findings about ethnic and acculturation differences in smoking rates and patterns are highly consistent with prior reports.<sup>1–10</sup> Latinos smoke less than non-Latino whites, and increasing acculturation is associated with increased smoking rates. We extended these findings by showing that measures of dependency (FTND and TTFC) paralleled these differences in prevalence: Latinos are less dependent than non-Latinos, and low-acculturated Latinos are less dependent than their more acculturated counterparts. These patterns bode well for Latino smokers attempting cessation because lower levels of dependence are associated with greater success in quitting.

A central aim of the present research was to identify correlates of NRT use. This may serve to expand understanding of why Latinos underuse NRT and point to interventions that could reduce this disparity. Consistent with prior reports was the finding that Latinos use NRT far less than non-Latino whites<sup>24,25</sup>; the difference in the current sample was almost exactly twofold. Again, the influence of ethnicity was magnified in the low-acculturation group, although both groups showed the effect. These profound disparities in use of NRTs by Latino smokers warrant both additional research into their causes and tailored interventions promoting NRT use.

The study identified several strong sociodemographic correlates of NRT use that help target Latino subgroups most in need of aids to help stop smoking. Latina women in this study use NRT more than Latino men, an effect most prominently seen in the low-acculturation group; no gender effect was observed in non-Latino whites. The reasons for the gender effect in Latinos cannot be clearly identified on available data, but the finding suggests that increased emphasis on promoting NRT use among Latino males, particularly those of low acculturation, may be useful. Age, education, and income were unrelated to NRT use among non-Latino whites. Among Latinos, older age ( $\geq 35$  years) was associated with increased odds of NRT use among Latinos and both acculturation subgroups. Again, this finding suggests that promoting NRT use, here among younger Latinos, is needed. The education effect was of lower magnitude and not significant in either acculturation group, but the overall group effect was significant and consistent with prior reports showing that higher educational achievement is associated with increased likelihood of using NRT.<sup>51,52</sup> Income had no bearing on NRT use.

Daily smoking rate and a measure of dependence (TTFC) were consistently related to NRT use across all groups. These findings have been observed in the general population; the present results demonstrated that they are applicable to Latino smokers as well, irrespective of acculturation. Further, they raise the possibility that Latino smokers with lower levels of dependence may benefit from use of NRT. A large majority (almost three-fourths) of Latinos have never used NRT, yet their mean smoking rate—in excess of one-half of a pack per day—suggests that NRT would be helpful.



Findings related to readiness to quit give grounds for optimism. A behaviorally based measure of this construct—report of a quit attempt lasting at least 1 day in the prior year—showed that Latinos were more likely than non-Latino whites to have made an attempt. Further, they were at least as confident in ability to quit (a measure predictive of later success), they rated quitting as more important, and they were more likely to be in the “preparation” stage—the most advanced stage of change applicable to this population of smokers. An interesting finding was that non-Latino whites in the “preparation” stage were significantly more likely to report having used NRT; no such relation existed for Latinos. This finding, in combination with the low base rate of NRT use among Latinos, suggests that they may not view NRT as a prominent cessation option. Once again, promotion of these therapies appears to be needed.

The present findings related to Latino misconceptions about smoking dependence and NRTs make their underuse of the therapies appear plausible, or even expected. These misconceptions serve as specific and promising targets for interventions to promote NRT uptake. Latino smokers were less likely to view themselves as addicted or (to a lesser extent) to view smokers as addicted, and such beliefs related strongly to NRT use. Education about the nature of nicotine dependence, about the wide variety of signs and symptoms attending withdrawal, and about the capacity of NRTs to ease the cessation process appears warranted. Mistaken beliefs and negative attitudes toward NRTs are common in the general population<sup>26–80</sup>; we replicated these findings and extended them by demonstrating in a population-based sample that these views are held still more strongly by Latino smokers. Two beliefs appear to be key to the problem of NRT underuse, as they predict lower use of the therapies: the belief that NRTs are addictive and that they are as bad as cigarettes. Taken together with the finding that nine in 10 Latinos believe that nicotine is carcinogenic, these beliefs point to the pressing need for improved education of Latino smokers about the rationale for NRTs, as well as their safety and efficacy.

Latino smokers reported more fatalistic attitudes about the longevity benefits of quitting than did non-Latino whites, although these beliefs were not related to history of NRT use. Nevertheless, to the extent that cessation motivation may be augmented by education about benefits to health and longevity, and that such motivation leads to actual attempts, such interventions have promise. It is notable that in spite of their relatively higher levels of fatalistic beliefs, Latinos still exceeded non-Latino whites in motivation to quit, as indexed by both attitudinal (self-reported motivation to quit) and behavioral (actual quit attempt in prior year) measures. Again, it appears that the deficit is not one of motivation; it is rather that NRTs are generally not on the menu of cessation options for Latinos. Addressing misconceptions and lack of information about both tobacco addiction and NRTs may help put them on the menu.

Consistent with prior reports,<sup>14–16,38–40</sup> the ethnic groups under consideration in this study differed significantly—and substantially—in views of smoking in moral or characterologic terms. Both smoking and failing to quit were more likely to be seen as moral failures by Latinos. These variables did not generally relate to use of NRT, however. The sole item in this set that related (negatively) to NRT use was the “willpower” measure—the statement that quitting smoking is only a matter of will. This belief (“voluntad propia” in Spanish) was endorsed by more than three-quarters of Latinos and only slightly more than half of non-Latino whites. These results confirmed findings of ethnic differences in belief about the importance of unassisted willpower in a broader sample and extended them by linking to NRT use. One avenue for intervention may be the reframing of willpower—an extension of this cultural value to include actions that strengthen it.

A positive finding in the present study was that differences between Latinos and non-Latino whites in rates of practitioner intervention were negligible. These findings conflict with other reports<sup>41</sup> and suggest that rates may vary significantly by region. The sole measure in this set of the “five As” to reveal differences was the “assess” item, addressing whether the practitioner assessed participant interest in quitting. Latinos reported receiving this intervention significantly less than non-Latino whites, an effect that was particularly strong in low-acculturation Latinos. To “assess” may well require more patient-practitioner interchange and communication than the other interventions. Language difficulties may explain some of the difference (especially in the low-acculturation group), but cannot explain all. The temporal disjunction between the “five A” variables and (practitioner intervention during the prior year) and ever-use of NRT renders measures of NRT use ORs uncertain, but one speculative interpretation is offered. The “assess” measure may index a patient-practitioner relationship characterized by effective communication. The significant ORs for NRT use as a function of the “assess” interchange in Latinos and both acculturation groups suggest both this interpretation and the potential utility of enhanced attention to two-way patient-practitioner communication with Latino smokers. Taken together with the findings reviewed previously—those documenting the prevalence and influence of mistaken attitudes in Latino smokers—the ready implication is that the “assess” stage would be an optimal point in the patient encounter to engage in an exchange characterized by both inquiry and education. Latinos low in language acculturation reported lower levels of practitioner intervention in the interventions that may be most demanding of effective (and time-consuming) communication. This could be attributable to the group’s more disadvantaged status on variables related to health care access (insurance status, having an identified practitioner and health care facility) and, of course, income.

The accessory “five A” items included in this research produced interesting, novel, and potentially useful findings. Latinos were more likely to report having acted upon practitioner advice to quit, a result suggesting receptivity to practitioner advice consistent with prior reports, one with obvious treatment implications. Yet Latinos do not appear to be disposed to use NRTs to help them quit. Consistent with this interpretation, a report that the practitioner explained how NRTs work was associated with increased likelihood of NRT use in all groups, most strongly in Latinos. The treatment implications are clear and straightforward (in conception if not execution): taking the time to explain the recommended intervention (and disabuse the patient of likely misconceptions) should pay dividends, particularly in Latino smokers. By current evidence, Latinos receive less of the interventions from which they stand to benefit most.

The strong and consistent pattern across several variables related to health care access shows substantially lower access to and use of health care for Latinos, and in particular for those low in language acculturation. Although not novel, the findings that each of the access variables was strongly related to use of NRT is notable, particularly in light of the fact that these variables were not related to NRT use in non-Latinos in the present sample. The potential causes for the relationship with access are manifold and not resolvable by our data, but the treatment implications are clear, if not easily applied by individual practitioners. Increased access to health care in Latinos is a promising way to promote NRT use and thus to increase their cessation rate.

Latinos low in acculturation are most disadvantaged in several domains. They are of lower socioeconomic status, have poorer access to health care, report lower levels of receipt of practitioner intervention and less use of effective cessation methods, and more often have attitudes antithetical to successful quitting. Promising implications of the current research are that the most disadvantaged can be readily identified on the basis of simple language preference; have low levels of addiction; and will be receptive to properly targeted

interventions, many of these educational. Although high-acculturation Latinos reported trusting their practitioner at a high rate at least equal to that in non-Latinos, significantly fewer low-acculturation Latinos reported such trust. Approximately one-third do not trust their practitioner, and a slightly higher proportion reported concern that their ethnicity may adversely affect their treatment in the health care system, although it is unclear where in the chain of health care delivery—from practitioner to clinic to facility to insurer or agency to government, and perhaps beyond—the discrimination is perceived. It does warrant further exploration.

The finding that one-fifth of the low language acculturation participants indicated that language obstacles have made it difficult to talk to their practitioner about smoking suggests obvious remedies in the form of increasing availability of bilingual practitioners in settings serving large numbers of Latinos, and particularly those of low acculturation.

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## SO WHAT? Implications for Health Promotion Practitioners and Researchers

### **What is already known about this topic?**

Latino smoking patterns differ as a function of both acculturation and gender. Emerging evidence suggests that they underuse effective cessation strategies, especially NRTs.

### **What does this article add?**

We showed Latino underuse of NRTs using a large and representative Colorado sample. A simple dichotomization of Latinos by language acculturation yielded multiple significant effects. Latinos—and especially those low in language acculturation—reported attitudes antithetical to NRT use. Specific promising intervention targets were identified. Lower Latino health care access relates to lower NRT use. Preliminary evidence of concern about discrimination in the health care system was found among low language acculturation Latinos.

### **What are implications for health promotion practice or research?**

Education of Latino smokers about smoking, addiction, and NRT is critically needed, especially among those low in language acculturation. Latinos in general appear to be motivated to quit and receptive to practitioner intervention.

Table 1

Sociodemographic Variables<sup>†</sup>

	Ethnic Groups		Acculturation Groups	
	Non-Latino Whites	All Latinos	Low	High
Gender, % female	60.9%***	44.9%	35.3***	52.6%
OR (male referent)	1.24	1.74***	1.94*	1.47
95% CI	0.84–1.83	1.27–2.39	1.14–3.28	0.98–2.21
Age				
Mean	47.1 (14.2)***	41.8 (13.8)	40.7 (13.2)*	42.6 (14.1)
Age 18–34 y (referent)	20.0%	32.2%	34.2%	30.7%
Age ≥35 y	80.0%	67.8%	65.8%	69.3%
OR	1.44	2.06***	1.83*	2.17**
95% CI	0.90–2.29	1.42–2.99	1.02–3.30	1.34–3.50
Education				
High school or less (referent)	39.2%	67.9%	78.0%	59.7%
Beyond high school	60.8%	32.1%	22.0%	40.3%
OR	1.29	1.53**	1.54	1.36
95% CI	0.87–1.92	1.10–2.12	0.86–2.78	0.91–2.03
Household Income categories				
<\$25,000 (referent)	27.6%	48.9%	57.9%	41.7%
\$25,000–<\$50,000	34.0%	31.5%	30.9%	32.0%
OR	0.88	1.16	1.18	1.06
95% CI	0.53–1.47	0.79–1.69	0.65–2.14	0.65–1.75
≥ \$50,000	38.4%	19.6%	11.2%	26.2%
OR	1.11	1.49	1.32	1.34
95% CI	0.68–1.82	0.97–2.29	0.57–3.06	0.80–2.27
Marital status dichotomy				
Not married (referent)	52.0%	52.1%	42.3%	59.4%
Married	48.0%	47.9%	56.7%	40.6%
OR	1.31	1.08	0.76	1.51*
95% CI	0.90–1.92	0.78–1.48	0.45–1.28	1.01–2.27

<sup>†</sup>Table shows percentages in each of the two ethnic groups (non-Latino whites and all Latinos) and in each of the two Latino subgroups, defined on the basis of language acculturation (low language acculturation and high language acculturation) for sociodemographic variables. (The continuous “age” variable presents group means and SD.) CI indicates confidence interval; and OR, odds ratio for history of nicotine replacement therapy use as a function of sociodemographic variables.

\*  $p < 0.05$ . Asterisks designate  $p$  value of subgroup difference within ethnic groups and acculturation groups, respectively.

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

Table 2

Smoking History Variables<sup>†</sup>

	Ethnic Groups		Acculturation Groups	
	Non-Latino Whites	All Latinos	Low	High
Cigarettes/d				
Continuous measure	16.2 (9.1) ***	11.0 (8.6)	9.5 (8.2) ***	12.3 (8.8)
OR	1.04 ***	1.05 ***	1.05 **	1.04 ***
95% CI	1.01–1.06	1.03–1.07	1.02–1.08	1.02–1.07
Dichotomy: 0–10 (referent)	38.1%	67.0%	75.1%	60.4%
Dichotomy: ≥11	61.9%	33.0%	24.9%	39.6%
OR	1.82 **	2.17 ***	2.93 ***	1.70 *
95% CI	1.23–2.70	1.56–3.02	1.67–5.12	1.13–2.57
Years smoking				
Continuous measure	29.1 (13.9) ***	23.6 (13.9)	22.6 (13.7) ***	24.4 (14.0)
OR	1.01	1.02 ***	1.02 *	1.02 ***
95% CI	0.99–1.03	1.01–1.04	1.00–1.04	1.01–1.04
Dichotomy: 0–10 (referent)	28.8%	44.3%	48.5%	40.5%
Dichotomy: ≥11	71.2%	55.7%	51.5%	59.1%
OR	1.52 *	1.95 ***	2.21 **	1.73 *
95% CI	1.00–2.29	1.40–2.73	1.28–3.82	1.13–2.65
FTND	3.75 (2.30) ***	2.70 (2.27)	2.49 (2.17) *	2.87 (2.34)
TTFC categories				
≥60 min (referent)	23.1%	47.5%	54.0%	42.3%
31–60 min	13.1%	14.0%	12.9%	15.0%
OR	1.72	2.69 ***	2.39 *	2.64 ***
95% CI	0.90–3.30	1.69–4.30	1.07–5.36	1.27–4.75
6–30 min	40.1%	22.8%	22.6%	23.1%
OR	2.29 ***	2.74 ***	4.87 ***	1.77 *
95% CI	1.39–3.78	1.82–4.12	2.54–9.35	1.04–3.00
≤5 min	23.7%	15.6%	10.6%	19.6%
OR	2.08 *	3.40 ***	4.78 ***	2.53 ***
95% CI	1.18–3.67	2.13–5.45	2.00–11.27	1.44–4.46
Quit confidence, % confident	57.4% *	62.7%	58.6% *	65.9%
Dichotomy: not confident (referent)	—	—	—	—
Dichotomy: confident				
OR	0.72	0.60 **	0.75	0.50 ***
95% CI	0.49–1.06	0.44–0.83	0.44–1.27	0.33–0.76
Quit importance				
Continuous measure	3.42 (1.33) ***	3.67 (1.34)	3.88 (1.22) ***	3.50 (1.40)
Dichotomy: not important (Referent)	—	—	—	—

	Ethnic Groups		Acculturation Groups	
	Non-Latino Whites	All Latinos	Low	High
Dichotomy: important				
OR	1.34***	1.17*	1.18	1.22*
95% CI	1.14–1.56	1.02–1.34	0.91–1.53	1.04–1.44
Stage of change				
Precontemplation (referent)	35.3%	31.0%	28.6%	32.7%
Contemplation	48.3%	39.7%	33.0%	44.4%
OR	1.22	1.22	1.86	1.13
95% CI	0.76–1.96	0.76–1.96	0.73–4.72	0.79–1.60
Preparation	16.4%	29.3%	38.4%	22.9%
OR	3.41***	1.28	1.57	1.72
95% CI	1.72–6.74	0.79–2.08	0.63–3.89	1.14–2.61

<sup>†</sup> Table shows means and SD for continuous measures and percentages for categorical variables for participants in each of the two ethnic groups (non-Latino whites and all Latinos) and in each of the two Latino subgroups, defined on the basis of language acculturation (low language acculturation and high language acculturation) for variables related to smoking, dependence, and attitudes toward quitting. CI indicates confidence interval; FTND, Fagerstrom test for nicotine dependence; OR, odds ratio for history of nicotine replacement therapy use as a function of tabled variable; and TTFC, time to first cigarette after awakening.

\*  $p < 0.05$ . Asterisks designate  $p$  value of subgroup difference within ethnic groups and acculturation groups, respectively.

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

Table 3

Endorsement of Attitudes about Smoking and Quitting<sup>†</sup>

	Ethnic Groups		Acculturation Groups	
	Non-Latino Whites	All Latinos	Low	High
Death in God's hands	34.0% ***	42.7%	48.7% ***	37.7%
OR	0.83	0.87	1.06	0.82
95% CI	0.55–1.25	0.63–1.21	0.63–1.80	0.54–1.25
No effect on mortality	33.0% ***	44.7%	53.3% ***	38.0%
OR	0.91	1.10	0.93	0.70
95% CI	0.66–1.26	0.65–1.87	0.61–1.42	0.46–1.07
Smokers addicted	94.0% **	89.0%	87.1	90.5%
OR	2.10	2.18 *	1.59	2.70 *
95% CI	0.91–4.86	1.09–4.35	0.59–4.27	1.02–7.12
I am addicted	91.5% ***	79.1	77.2%	80.6%
OR	3.30 **	3.31 ***	2.15	4.50 ***
95% CI	1.50–7.29	1.94–5.64	0.97–4.74	2.18–9.28
Chipping <sup>‡</sup> safe	23.4% **	30.7%	39.3% ***	23.8%
OR	1.07	0.76	0.86	0.77
95% CI	0.68–1.67	0.53–1.09	0.50–1.50	0.47–1.28
Moral weakness	25.2% ***	45.0%	52.5% ***	38.9%
OR	0.77	0.99	0.72	0.99
95% CI	0.56–1.06	0.59–1.68	0.47–1.09	0.64–1.52
Willpower	55.9% ***	77.9%	81.9% **	74.7%
OR	0.49 ***	0.38 ***	0.61	0.32 ***
95% CI	0.33–0.72	0.27–0.54	0.33–1.14	0.20–0.50
Relapse is weakness	21.7% ***	40.2%	51.6% ***	31.1%
OR	0.69	1.02	1.20	1.07
95% CI	0.44–1.08	0.74–1.40	0.71–2.03	0.70–1.64
Smoking a sin	11.0% ***	23.3%	29.8% ***	18.1%
OR	1.31	1.16	1.28	1.20
95% CI	0.72–2.37	0.81–1.67	0.74–2.22	0.73–1.98

<sup>†</sup> Percent of participants categorized as agreeing with culturally based attitudes and beliefs by ethnic group and by Latino language acculturation subgroup. CI indicates confidence interval; and OR, odds ratio for history of nicotine replacement therapy use as a function of tabled variable.

<sup>‡</sup> "Chipping" is aperiodic smoking.

\*  $p < 0.05$ . Asterisks designate  $p$  value of subgroup difference within ethnic groups and acculturation groups, respectively.

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .



**Table 4**Endorsement of Attitudes Toward Nicotine Replacement Therapy<sup>†</sup>

	Ethnic Groups		Acculturation Groups	
	Non-Latino Whites	All Latinos	Low	High
Bad as cigarettes	49.1% ***	63.9%	65.1%	63.0%
OR	0.46 ***	0.65 *	0.84	0.58 *
95% CI	0.31–0.68	0.46–0.90	0.46–1.41	0.38–0.89
Too expensive	55.2%	58.2%	52.8% **	62.6%
OR	0.80	1.62 **	2.91 ***	1.05
95% CI	0.54–1.18	1.14–2.25	1.63–5.22	0.60–1.61
Addictive	35.5% ***	55.4%	62.7% ***	49.7%
OR	0.78	0.64 **	0.83	0.60 *
95% CI	0.52–1.17	0.46–0.88	0.48–1.44	0.40–0.94
Cause cancer	81.1% ***	90.4%	91.2%	89.8%
OR	0.70	0.94	0.73	1.13
95% CI	0.42–1.16	0.53–1.69	0.27–1.94	0.55–2.34
Would help quitting	57.1%	58.1%	59.9%	56.8%
OR	1.57 *	2.00 ***	2.45 **	1.84 **
95% CI	1.06–2.34	1.42–2.83	1.35–4.45	1.20–2.82

<sup>†</sup>Percent of participants categorized as agreeing with attitudes and beliefs about nicotine replacement therapy by ethnic group and by Latino language acculturation subgroup. CI indicates confidence interval; and OR, odds ratio for history of nicotine replacement therapy use as a function of tabled variable.

\*  $p < 0.05$ . Asterisks designate  $p$  value of subgroup difference within ethnic groups and acculturation groups, respectively.

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

Table 5

Health Care Variables<sup>†</sup>

	Ethnic Groups		Acculturation Groups	
	Non-Latino Whites	All Latinos	Low	High
Ask	71.4%	75.3%	80.8% *	72.1%
OR	0.68	0.82	0.38 *	1.16
95% CI	0.42–1.12	0.53–1.27	0.17–0.86	0.69–1.95
Advise	63.1%	65.0%	62.5%	66.4%
OR	1.03	1.43	1.35	1.45
95% CI	0.65–1.62	0.94–2.17	0.64–2.86	0.88–2.39
Assess	35.5% ***	24.6%	19.8% **	28.4%
OR	1.30	1.82 ***	1.98 *	1.63 *
95% CI	0.87–1.94	1.29–2.57	1.10–3.58	1.06–2.50
Assist	35.5%	31.9%	25.8% *	35.3%
OR	1.16	1.52 *	1.41	1.48
95% CI	0.73–1.84	1.02–2.27	0.67–3.02	0.93–2.38
Arrange follow-up	9.9%	12.0%	11.4%	12.3%
OR	2.80 *	1.29	1.59	1.17
95% CI	1.16–6.75	0.73–2.27	0.59–4.28	0.59–2.32
Took advice	32.4% **	45.0%	50.0%	42.4%
OR	2.17 *	1.10	0.78	1.36
95% CI	1.19–3.98	0.70–1.77	0.33–1.84	0.78–2.34
Explained NRT	30.3% ***	18.5%	12.4% ***	23.5%
OR	1.67 *	2.30 ***	3.00 ***	1.87 **
95% CI	1.10–2.56	1.59–3.33	1.54–5.85	1.20–2.92
Have health insurance	77.7% ***	56.5%	38.7% ***	70.4%
OR	1.39	1.65 **	1.93 *	1.23
95% CI	0.86–2.24	1.17–2.33	1.11–3.37	0.77–1.96
Have practitioner	75.8% ***	52.3%	35.5% ***	65.9%
OR	1.32	2.13 ***	2.07 **	1.89 **
95% CI	0.84–2.06	1.53–2.96	1.22–3.51	1.20–2.96
Have health care site	79.6% ***	62.8%	50.6% ***	72.8%
OR	1.17	1.98 ***	2.09 **	1.64 *
95% CI	0.73–1.87	1.38–2.83	1.21–3.60	1.01–2.68
Medical visit in prior year	72.5% ***	59.1%	47.5% ***	68.6%
OR	1.27	2.16 ***	2.17 **	1.84 *
95% CI	0.82–1.97	1.51–3.08	1.25–3.77	1.14–2.97
Good self-rated health	77.8% ***	66.3%	60.9% ***	70.6%
OR	0.82	1.00	1.00	0.93

	Ethnic Groups		Acculturation Groups	
	Non-Latino Whites	All Latinos	Low	High
95% CI	0.52–1.28	0.72–1.40	0.59–1.69	0.61–1.43
Trust practitioner	79.8%	76.4%	67.5% ***	83.3%
OR	0.63	1.21	1.32	0.90
95% CI	0.39–1.04	0.79–1.84	0.69–2.50	0.50–1.62
Discrimination concerns	N/A	23%	36.7% ***	12.1%
OR		1.07	1.14	1.47
95% CI		0.74–1.57	0.67–1.94	0.82–2.64

<sup>†</sup> Percent of participants reporting receipt of each of the “five A” interventions, acting on medical advice, and reporting practitioner explained NRT. Remaining items address health care access (four items), self-rated health, and attitudes toward practitioner and the health care system (final two items). Values given for both ethnic groups and both acculturation groups. CI indicates confidence interval; N/A, not applicable; NRT, nicotine replacement therapy; and OR, odds ratio for history of nicotine replacement therapy use as a function of tabled variable.

\*  $p < 0.05$ . Asterisks designate  $p$  value of subgroup difference within ethnic groups and acculturation groups, respectively.

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .