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ACCULTURATION AND LATINO HEALTH IN THE UNITED STATES: A Review of the Literature and its Sociopolitical Context

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■ **Abstract** This chapter provides an overview of the concept of acculturation and reviews existing evidence about the possible relationships between acculturation and selected health and behavioral outcomes among Latinos. The effect of acculturation on Latino health is complex and not well understood. In certain areas—substance abuse, dietary practices, and birth outcomes—there is evidence that acculturation has a negative effect and that it is associated with worse health outcomes, behaviors, or perceptions. In others—health care use and self-perceptions of health—the effect is mostly in the positive direction. Although the literature, to date, on acculturation lacks some breadth and methodological rigor, the public health significance of findings in areas in which there is enough evidence justifies public health action. We conclude with a set of general recommendations in two areas—public health practice and research—targeted to public health personnel in academia, community-based settings, and government agencies.

INTRODUCTION

Health outcomes for Latinos are generally favorable when compared with other racial and ethnic groups in the United States. Two commonly used measures of population health include rates of adult and infant mortality. Mortality statistics for adults show that Latinos in the United States have lower mortality rates than do non-Latino whites and blacks. For example, in 2001 the age-adjusted mortality rate for Latinos was 22% lower than was the age-adjusted mortality rate among

non-Latino whites and 41% lower than was the age-adjusted mortality rate for non-Latino blacks (6). Similarly, birth outcomes statistics for 2001 show that infant mortality among Latinos was similar to that of non-Latino whites, and it was 58% lower than that of non-Latino blacks (6).

Yet the health outcomes of U.S. Latinos present a pattern of substantial heterogeneity in several dimensions. First, important indicators of population health vary among Latinos of Mexican, Puerto Rican, Cuban, and other Latino origin or cultural heritage. For instance, mortality and prevalence rates of chronic illness vary among both Latino children and adults of these different subgroups (33, 53, 55, 98, 102). Second, wide ranges of factors have been explored to explain this heterogeneity. These factors include more traditionally studied attributes such as socioeconomic status, educational level, and age, as well as other, less studied, contextual factors such as language fluency and immigration status, including time and number of generations living in the United States. These factors often are described as part of the phenomenon of acculturation to U.S. mainstream culture.

The focus of this chapter is to provide public health practitioners with an understanding of the concept of acculturation as one of many factors influencing the health of Latinos in the United States. We begin with a brief historical review of the concept, followed by a synopsis of how the term acculturation has been defined and used in the public health literature to date. We then present a critical review of existing evidence about the possible relationships between acculturation and selected health and behavioral outcomes among U.S. Latinos. On the basis of this review of existing evidence, we conclude with a summary of the relevance of acculturation to the design, planning, and implementation of public health programs for the Latino population; and we present recommendations for public health personnel in community, academic, and government settings.

ACCULTURATION AND ASSIMILATION: A HISTORY OF THE CONCEPTS

Milton Gordon (61) summarized thinking on the experience of European immigrant ethnic groups in America during the late nineteenth and early twentieth centuries in his 1964 book *Assimilation in American Life*, in which assimilation and acculturation were presented as unidirectional and inevitable. To become assimilated into the host society, the immigrant ethnic group had to make the major accommodation and develop, in the words of Gordon's mentor, Robert E. Park, "the memories, sentiments and attitudes of other persons and groups and, by sharing their experience and history. . .[become] incorporated with them in a common cultural life" (113). Those memories, sentiments, and attitudes the immigrants had to adopt were, of course, the "middle-class cultural patterns of largely white Protestant, Anglo-Saxon origins," often referred to as the "core culture" (61). When

immigrants had expunged their own ethnicity, the host society then would allow the "cleansed" ethnic group entry into "the social cliques, clubs and institutions of the core society," that is, into their inner-circle institutions (61). The most intimate entry, and the endpoint of the assimilation process, was intermarriage, upon which the minority groups' separate identity, having lost all value, would cease to be even a memory.

Acculturation, the acquisition of the cultural elements of the dominant society—language, food choice, dress, music, sports, etc.—was the process by which assimilation was to be achieved. Warner & Srole (151) described the acculturation process as one in which ethnic groups unlearned their inferior culturally based behaviors. The primary investigator of a maternal and child health project in Riverside County, California, sighed about the difficulty of getting Mexican immigrants to expunge their health-harming culture when she wrote, "So steeped are these people in their traditional ways and so accustomed are they to ill health and the constant presence of death, and so stupid are they in their ignorance, illiteracy and wasting diseases that lifting them out of this abyss is a real job" (84). In these views, acculturation to white, Anglo-Saxon norms would be the best thing to happen to ethnic groups, and the quicker the better.

Then, only months after Gordon published his state-of-the-art monograph, the Watts area of Los Angeles exploded in the first of the "long hot summers" that racked urban America, and changes in immigration law allowed the entry of a significant number of immigrants for the first time in nearly 40 years, only this time largely from Mexico, other Latin American countries, and Asia. Initially, experts assumed that the acculturation and assimilation models of the past would guide the fortunes of these new immigrant groups. But the unilinear, unidirectional, and inevitable assimilation of the earlier groups seemed suddenly to become an elusive goal. Some theorists tried to rework the old models, adding new elements that had been overlooked. Perlman & Waldinger (116), for example, pointed out that earlier European immigrant mobility had not been the result of individual choice and gumption alone; entry to inner-circle institutions came only after organized ethnic communities exerted economic, political, and legal pressure to force those institutions to accept individuals from ethnic communities.

Other theorists began to see some structural differences between earlier and current waves of immigrants. Alba (2) noticed a bimodal pattern of immigration. "Human capital immigrants," largely from Asia, who arrived with higher educational and occupational levels than those achieved on average by U.S.-born non-Latino whites, seemed to be succeeding quickly, in spite of racial distinctiveness. "Labor immigrants," largely from Mexico and Central America, with lower educational and occupational levels, made much slower progress. Portes & Rumbaut (119) noted in their study of second-generation children of immigrants that assimilation outcomes varied across immigrant minorities, and that archetypical rapid acceptance and integration into the American mainstream represented just one possible outcome. They offered a model of segmented assimilation, in which different groups could wind up in vastly different relationships to mainstream American

society, depending on three different variables: the human capital possessed by the immigrant group (education, wealth, occupational skills, and English ability), the policies of governmental institutions and the attitudes of native populations, and the structure and resources of the immigrants' families and communities. Groups with high human capital, whose presence is welcomed by policies generated by native populations, are likely to experience a smooth transition akin to that perceived of the older, European immigrant groups. Groups with low human capital, however, whose presence is resented or even rejected by the policies of the native population, are likely to wind up in a subordinate, permanent multi-ethnic underclass. In between would be a group whose individual members might have low human capital but whose community resources and networks provide access to social and economic mobility; even if the group's presence is resented by the native population, its very ethnicity provides a source of strength.

In Portes & Rumbaut's model, the process of acculturation can vary, ranging from dissonant acculturation, in which the child acquires cultural capital before the parent does, thereby upsetting parental roles; to consonant acculturation, in which parent and child acquire cultural elements at the same speed, preserving parental authority; to selective acculturation, in which a functioning ethnic community mediates between parent and child.

DEFINITIONS OF ACCULTURATION USED IN THE PUBLIC HEALTH LITERATURE

Unidimensional and Bidimensional Acculturation Models

Influenced by this previous historical context, the use and application of the concept of acculturation in the public health literature to date has included both unidimensional and bidimensional models. Unidimensional definitions, sometimes referred to as a "zero-sum game" (17, 36, 37, 124), assume that the acculturation experience occurs along a linear continuum from not acculturated (total immersion in the culture of origin) to completely acculturated (total immersion in the dominant or host culture); as the individual acculturates into the dominant culture, he or she loses his or her original cultural paradigms (17, 36, 37, 86). Unidimensional models probably best describe the experience of assimilation by which individuals "become part of the new group, and 'fold in' with members of the new culture" (11, 86).

Bidimensional models, questioning the validity of these assumptions, propose that acquiring or adhering to a new dominant culture is independent of maintaining the original culture (11, 17, 85, 87, 124, 125). Cultural maintenance is the degree to which an individual continues to value and adhere to the norms of the culture of origin. The level of participation and contact the individual has with the new dominant culture also can vary. Both domains theoretically range from full participation to full rejection of either culture's values, behaviors, and attitudes (11, 17).

Bidimensional models emphasize integration or biculturalism, in that they aim to characterize the experience by which individuals "feel equally comfortable in both cultures, hold the values and respect for norms of both cultures, and retain a dual cultural identity" (86).

In bidimensional acculturation models, different subcategories or states are possible: (*a*) assimilation—complete acquisition of the new culture, from the lack of desire to maintain the culture of origin or for other reasons; (*b*) separation—maintenance of the culture of origin through rejection or avoidance of the new culture; (*c*) integration—embracing and valuing both cultures; and (*d*) marginalization—exclusion (voluntarily or not) by both cultures (17). A similar, somewhat parallel categorization for the possible states within the bidimensional model has been articulated by Mendoza: (*a*) cultural shift—substituting new alternate cultural norms for original customs; (*b*) cultural resistance—resisting acquiring new alternate cultural norms while maintaining original customs; (*c*) cultural incorporation—adapting customs from both original and new alternate customs; and (*d*) cultural transmutation—alternating between original and new alternate cultural practices, thus creating a unique subcultural entity (100).

Transition into one of these categories or states assumes that an individual has control over these domains (11). This is not necessarily the case. Separation or marginalization, as described previously, can result from societal circumstances—such as prejudice, institutional racism, and segregational rules or laws—or historical circumstances, such as when a territory is invaded or annexed by another country (86).

In conceptualizing the process of acculturation, Marin postulates that the "culture learning" that is part of the acculturation process can be described on three levels. (*a*) First is a mostly superficial level including "the learning (and forgetting) of the facts that are part of one's cultural history or tradition" and "changes in the consumption of food and in the uses of the media" (86). Perhaps the reason these are considered superficial is that the adoption of things like food and media depends on the relative availability of these versus the ones from the culture of origin. (*b*) Next is an intermediate level including behaviors that are central to a person's social life, such as language preference and use, and preference for the ethnicity of friends, neighbors, spouse, and media in a multicultural environment. (*c*) Last is a more significant level and perhaps more permanent cultural learning, or adoption, of values and norms, including both maintenance of original cultural norms (e.g., familism in Latinos) and nonlinear adoption of new values. For example, Sabogal et al. (126) have shown that although certain aspects of familism—a sense of obligation and the power of the family as a behavioral referent—change as an individual becomes more acculturated, others (e.g., support received and expected from relatives) remain important to highly acculturated Latinos as well as to the less acculturated (126).

Magaña, who found that biculturalism does not equate to the equal embrace of both cultures, has further highlighted the nonlinear nature of the acculturation process. For example, bicultural individuals may speak Spanish predominantly

within the family, while maintaining social affiliations with individuals from both Latino and non-Latino cultural groups. In contrast, individuals who shift away from Latino to non-Latino culture speak English primarily within the home, yet at the same time they socialize predominantly with others of Latino descent (85).

Acculturation Measures and Scales

Public health researchers have used different proxy measures, including summary acculturation scales, to describe and understand the complex phenomenon of acculturation. Several unidimensional and bidimensional acculturation scales have been developed and published to date (9, 31, 32, 36, 37, 41, 54, 72, 87, 90, 100, 121, 134, 150, 159). Other than the key distinction of uni- versus bi-dimensionality, scales differ in the subconstructs of acculturation they intend to measure, including (*a*) engaging in culturally specific behaviors, such as music, diet, and media; (*b*) proficiency in, use of, and preference for the Spanish or English language; (*c*) knowledge of culture-specific history and current events; (*d*) a sense of cultural identity; and (*e*) adoption of and belief in culture-specific values. These scales have been used and validated to different degrees. All scales include language as a subconstruct. Some scales exclude the behavioral component because engaging in these behaviors reflects, to a certain extent, the availability and accessibility of culture-specific items such as music and food, not an individual's preference per se (86, 159). Also, values and norms are more difficult to measure than are language preferences and patterns in food consumption, and therefore they are not included in many of the scales (86).

The heavy dependence of acculturation measures and scales on language has pros and cons. Supporters argue that psychometric analyses show that language items, compared with other constructs, explain most of the variance of acculturation scales (86). Also, although language is a complex construct—involving differential capacities to read, speak, and think, as well as levels of use based on preferences or opportunity for use (87, 159)—it is among the easiest acculturation constructs to measure. In his Behavioral Acculturation Scale (BAS) scale, for instance, Marin (87) makes distinctions between language use, proficiency, and media exposure.

Critics, in contrast, argue that the language measures do not capture the complexity of language use among bicultural individuals. Marin (86) states that "among Latinos/as it is to easy to find people who are primarily English or Spanish speaking, regardless of either their place of birth or their length of residence in the U.S., as well as individuals who are fully bilingual." Furthermore, acquisition of the English language does not necessarily mean sustenance of the Spanish language, or vice versa. An initially monolingual person can become either bilingual in the native and host languages or monolingual in the host language (86).

Critics of acculturation scales outline other weaknesses aside from this potential overemphasis on language. These can include the lack of appropriate psychometric testing, such as in the informal adaptation of previously validated scales, and the inclusion of sociodemographic characteristics (e.g., generation of respondents) as measures instead of as correlates of acculturation (criterion variables). For instance,

the large-scale Hispanic Health and Nutrition Examination Survey (HHANES) uses a mixture of criterion and measurement variables in identifying the level of acculturation. Critics argue that the inconsistent relationships observed between the effects of acculturation in different Latino health outcomes are, in fact, due in large part to these differences in measurement (86).

In addition to summary scales, researchers also have used some of the same individual constructs to measure by proxy the acculturation phenomenon. Other than language, some of these proxy measures—including generational status (first, second, or third U.S. generation), age at immigration, place of birth (United States versus foreign), and place of education—assume that acculturation can be approximated by the amount of exposure individuals have to the dominant culture (17, 105, 125).

Significant variability may exist in the effects and manifestations of acculturation at the individual level, and acculturation scales aim at capturing that variability. Groups may behave differently than do individuals, e.g., Mexican Americans may, as a group, show certain effects of acculturation, but an individual Mexican American might have different shades of use/effect of language, income, etc. (11, 17).

Understanding and measuring acculturation are complex and difficult undertakings. Ideally, they would involve describing not only proxy measures for the construct, but also important contextual factors likely to be important mediators of the process. Contextual factors influencing the process of acculturation have been summarized by Cabassa (17). These include context prior to immigration (society of origin factors and individual factors), immigration context, and settlement context (society of settlement factors and individual factors). Another important modifier is the variability among individuals in the degree of stress experienced, the coping capacity of individuals, and the actual outcome of the acculturation process (11, 17).

In summary, although Redfield's original definition of acculturation implies bidirectional influence (17, 86), most theories and measures to date have captured "the changes that occur in the group and individuals that are being acculturated to a dominant culture" and the "psychological and social changes that groups and individuals experience when they enter a new and different cultural context" (11, 17). Acculturation is a "rather fluid process that implies movement at different speeds across different dimensions (e.g., behaviors, attitudes, norms, and values) and planes. . .[and] that does not typically follow a deficit mode, but rather implies growth across a variety of continua" (86).

CURRENT EVIDENCE REGARDING THE EFFECTS OF ACCULTURATION ON LATINO HEALTH OUTCOMES

Literature Review Methods

Prior to conducting our review, we identified a list of areas on which to focus our literature search. Our process of selection and review of the scientific literature was

as follows. In each area two of the investigators reviewed article and book titles for inclusion. The abstracts of those titles agreed on by two individuals were reviewed using a structured form for easy screening for relevance and summary of the key findings. A summary of findings in each area and resulting recommendations were discussed and approved by the coauthors. We supplemented our literature search with other key review articles familiar to the coauthors or referred to them by other experts in the field.

Overview of Findings

Table 1 presents a summary of the studies in the literature areas we reviewed: health behaviors, health care use and access, self-assessed health perceptions, birth outcomes, chronic diseases, and mental health outcomes. In evaluating the effect of acculturation we determined if the evidence from each study supported (*a*) a negative effect (acculturation is associated with worse health outcomes, behaviors, or perceptions), (*b*) a positive effect (acculturation is associated with better health outcomes, behaviors, or perceptions), or (*c*) a mixed or no effect. A mixed effect might be, for example, a study showing that acculturation had opposite effects by gender, or alternately a positive effect according to one measure of acculturation, e.g., foreign place of birth, but a negative or no effect according to another, e.g., language. In this section we provide an overview of the major findings of our review, followed by a more specific description by area of the findings of key studies.

Our most important overall finding is that the effect of acculturation, or more accurately, assimilation to mainstream U.S. culture, on Latino behaviors and health outcomes is very complex and not well understood. Although we can identify certain major positive or negative trends in the subject areas reviewed, the effects are not always in the same direction, and many times the effects are mixed. Thus, depending on the subject area, the measure of acculturation used, and factors such as age, gender, or other measured or unmeasured constructs, acculturation may have a negative, positive, or no effect on the health of Latinos.

Although not absolute, the strongest evidence points toward a negative effect of acculturation on health behaviors overall—substance abuse, diet, and birth outcomes (low birthweight and prematurity)—among Latinos living in the United States. More acculturated Latinos (those who are highly acculturated) are more likely to engage in substance abuse and undesirable dietary behaviors and experience worse birth outcomes compared with their less acculturated counterparts. Furthermore, the negative effect of acculturation on substance abuse, although not completely uniform across areas, appears to have a stronger relative effect on women than on men (144, 148).

However, evidence suggests that the acculturation process has a positive effect on health care use and self-perceptions of health. Some studies have found that more acculturated Latinos are more likely to use preventive services (75, 96) (e.g., cancer screening) and have a better self-perception of health than do the less

TABLE 1 Referenced studies examining the relationship between acculturation and selected behaviors, health care use measures, and health outcomes among U.S. Latinos[1]

Area	Negative effect[a]	Mixed or no effect	Positive effect[b]
Health Behaviors			
Nutrition	10, 42, 62, 64, 96, 106, 109	97	
Exercise	49, 62, 135	20	34
Substance abuse			
General drug use	14, 23, 57, 58, 108, 141, 147, 148	48	
Cocaine	3, 23, 144	128, 149	
Marijuana	3, 23, 144	141	
Alcohol	12, 23, 89, 96, 109, 117, 145, 147	20, 92, 95, 141	
Smoking	28, 30, 47, 58, 62, 78, 109, 145	20, 43, 88, 91, 127, 142	
In pregnancy			
Breastfeeding		15	
Smoking	1, 27, 73	156	
Diet and other behaviors	27, 158		
General substance abuse	29, 73, 158		
Health care use and access			
General health care use		94	24
Use of preventive services		134	26, 75, 96
Have a regular source of care			63
Insurance			63, 75, 140
Continuous Medicaid insurance		67	
Decreased barriers to care			26, 153
Satisfaction with care			75
Immunizations	4, 120	52, 101	
Cervical cancer screening		137, 157	44, 59, 68, 96, 133
Breast cancer screening		122, 137, 157	13, 44, 59, 68, 107, 114, 115, 133
Health perceptions and outcomes			
Self health assessed reported health			5, 51, 98, 131
Birth outcomes			
Low birthweight	17, 22, 27, 45, 77, 129, 132	7, 46, 123, 156, 158	

(*Continued*)

TABLE 1 (*Continued*)

Area	Negative effect[a]	Mixed or no effect	Positive effect[b]
Prematurity	22, 35	156, 158	
Teenage pregnancy	29		
Caesarean birth/postpartum complications		73, 123	
Neonatal and Post-neonatal mortality	132	45, 82	
Childhood illness at 8–16 months	65		
Chronic conditions			
Childhood asthma	81, 99	83	
Diabetes	29, 135, 155	69, 80	72
Hypertension	50	93	
Coronary artery disease mortality		139	
Obesity—adolescent	62, 118	20, 79, 138	
Mental health	1, 108, 147	14	
Depression—adolescents	74, 103	38, 76, 141	60

[a]Acculturation associated with worse/detrimental outcomes or behaviors; [b]Acculturation associated with better/beneficial outcomes or behaviors.

[1]Shaded boxes indicate overall tendency of acculturation effect on shown outcomes: negative effect, mixed or no effect, or positive effect.

acculturated (51). There are important exceptions, however, in which the evidence is not as clear: for example, the effect of acculturation on immunization rates, where studies have shown both a negative and no effect (4, 52, 101, 120).

When reviewing the literature, we found that, across the board, past research studies have not been consistent in their measurement of acculturation or in their adjustments for possible confounding factors. This inconsistency is very important to consider in the overall interpretation of the findings. In some cases, the acculturation effect on health outcomes can be related to whether language, country of origin, or an acculturation scale was used to measure acculturation. For example, English (46) found that Mexican maternal nativity, and not necessarily speaking Spanish, was associated with better birth outcomes. In other cases, when studies have controlled for factors such as age, educational attainment, income, insurance, and other predisposing, enabling, or need factors, the effects of acculturation diminish or disappear (67, 157, 158). For example, in some studies, the "protective" or positive effect of acculturation on some health care use behaviors (e.g., cancer screening) has been accounted for by higher educational and income levels among the more acculturated (157). Solis and colleagues (134) found that socioeconomic status (SES) characteristics, and an access "score," predicted health care use more strongly than did acculturation. Of the acculturation variables, language but not

ethnic identification predicted use. From these findings Solis and colleagues (134) concluded that "the effect of language on screening practices should not be interpreted as a cultural factor, but as an access factor."

Finally, almost all research on the effects of acculturation on Latinos in the United States has been done on persons of Mexican origin. The very few studies that have compared the effect of acculturation across Latino subgroups suggest that the experience of acculturation and its effects on health outcomes may be different for Mexicans and Puerto Ricans. The prevalence of childhood asthma and related risk factors is associated with different effects in Mexicans and Puerto Ricans according to place of birth. Island-born Puerto Ricans—presumed to be less acculturated—have a higher prevalence of asthma than do those born in the 50 U.S. states and the District of Columbia. On the contrary, less acculturated (foreign-born) Mexican American children have a lower prevalence of asthma and related risk factors than do their more acculturated (U.S.-born) counterparts (81, 83). Likewise, diabetes in pregnancy is more prevalent among Island-born Puerto Ricans but not in foreign-born Mexicans (80). Investigators have shown some small differences in illness-related beliefs for asthma and diabetes among individuals of different Latino subgroups (110–112, 152). It is unlikely, however, that these small differences account for the large differences in prevalence. Another possibility is varying patterns in disease recognition, diagnosis, and actual predisposition to disease. The degree to which possible differences in the acculturation experiences between Mexicans and Puerto Ricans account for this effect is a question for future research. The relevance of the concept of acculturation to Puerto Ricans—given that they are U.S. citizens and, thus, exposed to U.S. mainstream culture from birth—also should be examined.

ACCULTURATION IS ASSOCIATED WITH SEVERAL NEGATIVE HEALTH-RELATED BEHAVIORS AND HEALTH OUTCOMES IN LATINOS Most studies evaluating the relationship between acculturation and substance abuse have found a negative effect of acculturation on substance abuse behaviors, both in general and specifically in pregnancy, including use of illicit drugs, alcohol, and smoking. Negative effects of acculturation also have been demonstrated regarding dietary practices and birth outcomes.

1. *Illicit drug use* The negative effect of acculturation on drug use, including marijuana, cocaine, and other illicit drugs, has been demonstrated in adults, pregnant women, and adolescents (3, 57, 58, 144, 146). Some of these studies have shown a stronger negative effect in females than in males (144, 148). Although most studies have been conducted in Mexican American populations, some have included other Latino subgroups. Turner (141) found a negative effect of acculturation among U.S.-born Cubans and other U.S.-born Caribbean-origin Latinos in southern Florida, and Velez (148) showed that, among Puerto Rican female adolescents, the effect of acculturation on drug use was more pronounced and was related to length of time lived in New York City. Some of these studies evaluated possible confounders and

interactions. For example, Amaro (3) found that among Mexican Americans and Puerto Ricans of lower educational attainment, illicit drug use was linked more strongly with predominant use of English than it was among those of higher educational attainment. The relation between acculturation, as measured by language, and drug use also varied by sex, marital status, and place of birth. From these findings, Amaro concluded that the experience of acculturation is associated with socioeconomic context. Velez (148) found that lower socioeconomic status was associated with drug involvement by adolescents in New York City, but not among Puerto Ricans on the Island.

2. *Drinking* The detrimental effect of acculturation on patterns of alcohol use is clearest in women; the effect is more ambiguous among men (12, 92, 95, 96, 109, 117). Men have a higher prevalence of alcohol consumption to begin with, so the acculturation effect reflects a closing of the gap between men and women (89, 96, 154). Gender differences observed in the data from the HHANES analyzed by Marks et al. (96) illustrate that, on average, Mexican American, Cuban American, and Puerto Rican men are more than two times as likely to be alcohol users, compared with women (e.g., 77.4% for Mexican American men compared with 34.7% for Mexican American women). The correlation of acculturation and drinking was close to three times greater for Mexican American and Cuban American women than for men (0.30 versus 0.11, 0.36 versus 0.13, respectively) and six times greater for Puerto Rican women than for men (0.26 versus 0.04). The strong influence of non-Latino norms results in the adoption of practices similar to those of non-Latina women as Latinas acculturate. This effect is not observed in men because Latino and non-Latino men exhibit similar drinking behaviors to begin with.

   The effect of acculturation on drinking is complicated and related to both frequency and volume of drinking. The relationship of consumption frequency, i.e., the number of days a person consumed any alcoholic beverage, and acculturation observed by Marín & Posner (89) showed that increased drinking is related to an increase in acculturation. Less acculturated Mexican Americans and Central Americans drank less often than did the more acculturated (6.3 days versus 8.3 and 3.9 days versus 5.9, respectively). A reverse effect, however, was noticed with respect to volume, or the mean number of drinks per day. Less acculturated Latinos drank in greater volume, compared with the more acculturated—on average 3.1 drinks versus 2.8 drinks in Mexican Americans and 2.9 drinks versus 2.7 drinks in Central Americans. Furthermore, the pattern of frequency and volume of alcohol consumption is heightened in men. There does not seem to be an age effect, however, in the relationship between acculturation and drinking patterns (18, 89).

3. *Smoking* Acculturation also has an overall negative health effect on smoking in both men and women, but the effect is not as strong as on drinking (28, 30, 96). According to Marks et al., (96) the correlation of drinking and

acculturation in Mexican American women (0.30) is three times greater than that of smoking and acculturation (0.09). There is also a gender pattern in the relationship between acculturation and smoking. Although the prevalence of smoking is shown to be greater in men (32.4%) than in women (16.8%), acculturation in women is associated with more smoking, including smoking during pregnancy (109). For example, the analysis of a phone survey conducted by Marín et al. (88) found age-adjusted smoking rates to be greater among more acculturated women (22.3%) versus less acculturated women (13.6%). In men, the pattern was not as clear.

4. *Nutrition and dietary patterns* Diets can be more nutritious among the less acculturated. Several studies have found that less acculturated Latinos consume healthier diets than do their more acculturated counterparts. Less acculturated Mexican American women consume less fat and more fiber. They have a higher intake of protein; vitamins A, C, E, and B_6; and folate, calcium, potassium, and magnesium than do their more acculturated counterparts (42, 64). Although Latino elders overall consume significantly less saturated fats and simple sugars and more complex carbohydrates than do non-Latino whites, Latino elderly who have resided in the United States for a longer time have macronutrient profiles and eating patterns more similar to those of non-Latino whites (10). Latinos, on average, consume one or more servings of fruits and vegetables more per day than do non-Latino whites. However, highly acculturated Latinos eat half the servings of fruits and vegetables less than do the less acculturated (106). Another study (97), however, on the basis of the National Health and Nutrition Examination Survey, found that lower levels of acculturation only partially ameliorated the negative association between poverty and undesirable dietary patterns in Latino youth.

5. *Birth outcomes* Among the negative effects of acculturation on health outcomes, the effect on birth outcomes stands out. An extensive literature documents that a higher acculturation level is associated with worse birth and perinatal outcomes [prematurity, low birthweight (LBW), teen pregnancy, neonatal mortality], as well as with undesirable prenatal and postnatal behaviors (smoking and drug use during pregnancy, decreased number of breastfeeding mothers). The effect is the "cleanest" in Mexican American women. Among Mexican American women, acculturation is associated with lower birth weight (19, 22, 27, 56, 129, 132, 156), prematurity (22, 35, 156), and teenage (<17 years) births (29). Cobas found that acculturation appears to affect LBW status indirectly through smoking and dietary intake (27). Wolff (156) found that more acculturated pregnant women smoke more. Acculturation is associated with more smoking, alcohol, and street drug use during pregnancy (29, 73, 156, 158). Coonrad et al. (29) found that highly acculturated Latina women were four to seven times more likely to acknowledge substance abuse during pregnancy. Frequency of tobacco use in highly

acculturated pregnant Latina women was 13.8%, compared with 3.4% in the less acculturated. Likewise, alcohol use and drug use in highly acculturated and less acculturated pregnant women was 7.8% versus 1.8% and 14.5% versus 2.0%, respectively (29).

For Puerto Rican women and their babies, the effects of acculturation are similar to those on Mexican Americans, except for neonatal mortality; Island-born babies have a higher birthweight-specific neonatal mortality rate than do mainland-born Puerto Rican babies (7.8 versus 6.8). Infants of island-born Puerto Rican mothers, however, had lower birthweight-specific postneonatal mortality rates than did babies of Mainland-born Puerto Rican mothers, a rate of 3.5 compared with 4.4 (45).

Yet some literature also suggests mixed or no effects on birth outcomes. This is related to the fact that acculturation is a complex phenomenon: Language, place of birth, and length of stay in the United States contribute to different effects. For instance, Zambrana (158) found that although higher acculturation was significantly associated with more undesirable prenatal behaviors and risk factors in Mexican American women, there were no direct effects of acculturation on infant gestational age or birthweight. In a study of related birth outcomes, Acevedo (1) found that Mexican American mothers were at lower risk for cigarette smoking during pregnancy but at higher risk for adverse parenting beliefs, such as lack of empathy, physical punishment, unrealistic expectations, and role reversals, than were European American women of the same low-income background. Among Mexican American women, Spanish speakers were at lower risk for cigarette smoking and mental health problems during pregnancy, but were at a higher risk for adverse parenting beliefs, than were bilingual and English-only speakers. Reynoso (123) compared Mexican American pregnant teenagers who were more acculturated with those who were less so. More acculturated teenagers were younger on first instance of sexual intercourse, were more educated, and sought earlier prenatal care, but no differences in birthweight between groups were observed. Landale (82) compared Mainland-born Puerto Ricans, Island-born Puerto Ricans in Puerto Rico, and Island-born recent immigrants to the United States. Controlling for age, income, marital status, social support, previous history of LBW, substance abuse during pregnancy, prenatal care, and WIC participation, he found that Mainland-born and Island-born Puerto Ricans in Puerto Rico have similar rates of infant mortality, although these two groups had higher rates than did those of Island-born immigrants to the Mainland, when the study also controlled for LBW. Without controlling for LBW, however, children of Puerto Rican women in Puerto Rico had higher infant mortality.

Some studies have found that foreign place of birth and language have different, individual effects on birth outcomes. As stated previously, English et al. (46) found that the mother's birthplace was correlated more closely with low rates of LBW than to Spanish language preference. Heilemann (73) found that more acculturated Mexican American women had more prenatal complications, excessive maternal weight gain, cesarean births, postpartum complications, and a

higher prevalence of sexually transmitted diseases and substance abuse than did less acculturated women. Yet these effects were predicted most consistently by place of birth, not language. Similarly, Wolff & Portis (156) found that Mexican American women with a moderate American orientation experienced significantly poorer birth outcome indicators (LBW and prematurity) and higher rates of smoking than did women with either a stronger American orientation or a Mexican orientation. Finally, although the overall direction of Balcazar's (7) findings was like that of most studies in the field, surprisingly, he found that length of U.S. residence had an opposite effect in predicting both birth outcome indicators, when compared with acculturation.

Evidence for the effect of acculturation on breastfeeding is more mixed than birth outcomes. Lower acculturation is associated with a more likely decision to breastfeed, yet more breastfeeding is observed among the more educated. Byrd et al. (15) found that lower levels of acculturation are associated with a history of breastfeeding and intention to breastfeed, with multipara women born in Mexico or primipara women who grew up and were educated in Mexico more likely to intend to breastfeed. Yet women with less education, women who were single, and women who did not receive any prenatal care were less likely to intend to breastfeed than were women with a college education, women with a partner, and women who received prenatal care.

Acculturation is Associated with Improved Access to Care and Use of Preventive Health Services Among Latinos

More acculturated Latinos have higher rates of insurance coverage and access to health care. Thamer et al. (140), using the 1989–1990 NHIS (National Health Interview Survey), found that foreign-born Latinos who had resided in the United States for fewer than 15 years were 2–5 times more likely to be uninsured than were non-Latino whites. Granados and colleagues (63) found, in a predominantly Latino sample in Wilmington, Los Angeles, that the proportion of insured children enrolled in public or private insurance at the time of study and those reporting a usual source of care increased, respectively, from both foreign-born parent-children dyads to mixed dyads to U.S.-born parent-children dyads. Hu & Covell (75) found, in a study of Latino adults in San Diego, that the primary use of English, as compared with two other groups—bilingual and primarily Spanish—was positively correlated with a higher frequency of general physical, vision, and dental check-ups; being more satisfied with health care; having insurance; having a self-perception of excellent health; and having ever been hospitalized. These relationships remained constant when controlled for income, age, sex, and having a regular source of care.

Other studies have shown mixed results. Markides et al. (94) undertook a path analysis to evaluate the contribution of factors in the Andersen model vis-à-vis acculturation in a three-generation study of Mexican Americans in San Antonio. When controlled for potential predisposing (age, sex, marital status), enabling (insurance, employment), and need (number of chronic diseases, physical symptom

scale, self-rated health, worry about health) factors, acculturation was not directly associated with increased physician visits in the previous year among the more acculturated. Similarly, Halfon and colleagues (67) found that continuous Medicaid enrollment among Latino families in South Central and East Los Angeles was not associated with residency status, length of U.S. residency, or language preference. Moreover, he found that "insurance status and provider type were more consistently associated with access rather than residency and language preference" (p. 636). Finally, Solis et al. (134) used the HHANES to evaluate the relationship of use of preventive health services (physical, dental, and vision examinations) among Mexican Americans, Cuban Americans, and Puerto Rican adults to an "access score"—measured by a scale of insurance, having a regular place for care, type of facility used, having a regular provider, and travel time—and to an acculturation scale, eight subset items from the Cuellar scale. Solis found that socioeconomic status characteristics and the access score predicted health care use more strongly than did acculturation. Of the acculturation variables, language, but not ethnic identification, predicted use.

The more acculturated also have fewer barriers to care. Wells (153), even after controlling for poverty, transportation, and other barriers, found that the less acculturated have more barriers to mental heath care and that these barriers are associated with predisposing and enabling factors in this group. Chesney (24), while controlling for social class and social isolation, found in a largely Mexican American population living near the Texas-Mexico border that their predisposition to use of health care services was directly related to acculturation: The highly acculturated had twice the rates of utilization of the less acculturated. In an ethnographic study of Latina women in the Rocky Mountain West, Clark (26) found that immigrant or less acculturated Latina mothers described more barriers to care than did more acculturated mothers.

Finally, acculturation is associated with higher use of some preventive services by women, including screening for breast cancer and pap smears (13, 44, 59, 68, 96, 107, 114, 115, 133). Borrayo et al. (13) found that 58.2% of U.S.-born women of Mexican descent had received a mammogram in the past year, compared with 48.6% of Mexico-born women. Furthermore, 62% of the U.S.-born women reported a breast self-exam (BSE) in the past month, compared with 45% of Mexico-born women. Goel et al. reported that Latinas were less likely to undergo a pap smear (77%) than were non-Latina whites (86%). After controlling for sociodemographic and other covariates, foreign-born Latina women had 0.65 (95% C.I. 0.53–0.79) the odds of receiving a pap smear when compared with non-Latina whites. There were no differences in pap smear rates between U.S.-born Latinas and U.S.-born non-Latina whites (59).

In Other Areas, the Effects of Acculturation are not Clear to Date

Our review did not demonstrate a clear relationship between acculturation and the other conditions and areas studied. This lack of clear relationship resulted either

from an insufficient number and/or quality of studies or from multiple studies that demonstrated opposite or no effects. This included studies related to the effect of acculturation on certain Latino behaviors (e.g., exercise), prevalence of chronic diseases (e.g., asthma, diabetes, hypertension, obesity), and mental health outcomes. The lack of clarity about the effects of acculturation on various mental health outcomes also has been documented by others (8).

RECOMMENDATIONS FOR PUBLIC HEALTH PRACTICE AND RESEARCH

On the basis of our review's findings, we present in this section general recommendations for public health personnel and scientists in two general areas: public health practice and research. Given the state of the literature on acculturation and health outcomes in Latinos, our desire is to outline both the major opportunities and the remaining challenges in this field.

Public Health Practice Recommendations

The literature on acculturation to date lacks sufficient breadth and methodological rigor to make comprehensive and definitive evidence-based recommendations about how to modify the acculturation effects of the U.S. social and physical environments on the health of Latino children and adults in all areas. Yet in some areas—substance abuse, dietary practices, birth outcomes, and health care utilization—there is enough evidence, to date, to justify public health action.

The following recommendations apply to public health practitioners in community, academic, and/or government settings.

INCREASE KNOWLEDGE AND AWARENESS OF THE ROLE OF ACCULTURATION IN LATINO BEHAVIORS, HEALTH OUTCOMES, AND HEALTH CARE USE Given evidence of the detrimental effects of acculturation on some health behaviors and outcomes among U.S. Latinos, planners and implementers of public health programs to promote healthy dietary practices, improve birth outcomes, decrease alcohol and illicit drug usage, and increase health care use among Latinos/as should take into account acculturation in the design and actual implementation of their programs. At the field level, for example, public health staff working in community settings could be educated about the general role of acculturation, its effects in key areas, and strategies to better target Latinos for services based on their acculturation levels. At the administrative level, awareness-promoting activities could target government public health officials administering, funding, and implementing programs. In an era of limited resources, this would facilitate selection of and favorable review of effective Latino public health programs that incorporate acculturation as part of their planning and implementation strategies. Finally, at the academic level, teaching and application of the concept of acculturation and its relevance to Latino health should be included in public health schools' curricula.

INCREASE USE OF ACCULTURATION MEASURES AMONG PUBLIC HEALTH PERSONNEL Although language and nativity are imperfect proxy measures for acculturation, they are the most practical measures that can be used in real-life public health settings. It is better to use some measure of acculturation than none at all. At a minimum, public health practioners should have information on the language and nativity of all their Latino clients. They also should have information on immigrants' length of residence in the United States and be able to differentiate between language of preference and that of use in evaluating acculturation among Latino clients. Government public health officials also should promote the inclusion of acculturation measures in all major government health surveys.

PROMOTE THE MAINTENANCE OF HEALTHY BEHAVIORS AMONG THE LESS ACCULTURATED AND PROMOTE THE REACQUISITION OF THESE BEHAVIORS AMONG THE MORE ACCULTURATED A key public health issue is avoiding the erosion of certain healthy behaviors among less acculturated Latinos to the less desirable population average of other groups. The goal would be to reinforce positive behaviors among the least acculturated and inspire a return to good behaviors among those who are becoming acculturated. Strategies might include educational programs to prevent the acquisition of drinking, smoking, illicit drug use, and other unhealthy behaviors, and to encourage the maintenance of beneficial nutritional practices and other desirable behaviors among the less acculturated. Social marketing and/or behavioral modification techniques could be tested, among other strategies, to provide positive reinforcement and a sense of pride in individuals who, although less acculturated, undertake healthier behaviors (e.g., eating more nutritious meals even if families are low-income).

Because of the considerable evidence of the negative effect of acculturation on dietary practices among Mexican Americans, we also recommend testing novel strategies that would encourage the use of recipes and staples of a healthy, less-acculturated diet in existing educational and nutritional public health programs, such as the WIC program. For example, financial incentives for healthy diet choices among the least acculturated, such as more credit on WIC food coupons for these foods, could be an effective strategy to promote continuation of good nutritional practices.

In the specific case of substance abuse programs (including smoking, alcohol, and illicit drugs), prevention, educational, and other treatment programs should be tailored to the individual's level of acculturation and gender. Highly acculturated Latinas are a group with significant potential for risk reduction, on the basis of the stronger relative effects of acculturation on unhealthy behaviors and outcomes in women as compared with men. Contrary to other areas, in which the evidence of the effects of acculturation are mostly on persons of Mexican origin, in the area of illicit drug use, there is a strong argument for targeting prevention and control programs to the more acculturated youth of all Latino groups: Mexican American, Puerto Rican, Cuban, and others.

PROMOTE THE USE OF BOTH GENERAL AND SPECIFIC HEALTH SERVICES AMONG LESS ACCULTURATED LATINOS More research is necessary to confirm the positive effect of acculturation on health care use by Latinos: specifically, to study the degree to which decreased health care use among less acculturated Latinos is due to acculturation level per se, versus mediating factors associated with less acculturation, such as lack of insurance and greater language barriers to care. We understand, however, that there already exists enough evidence to justify public health action to improve access to health care among less acculturated Latinos living in this country, and that strategies to increase the proportion of unacculturated Latinos who have medical insurance should be explored and implemented. For example, implementation of the national standards for Culturally and Linguistically Appropriate Services in Health Care recommended by the Office of Minority Health of the U.S. Department of Health Services (143) would improve the cultural competency of services—including language accessibility—and improve health care access and use in the least acculturated groups.

We also recommend the implementation and evaluation of outreach programs for less acculturated Latinos who are at risk of worse health and behavioral outcomes. There is a strong argument for implementation of public health programs that would increase utilization of preventive health and dental care, as well as breast cancer and cervical cancer screening, among less acculturated Latinos. In the case of prenatal programs for more acculturated Latinas, evidence also supports a need for the early identification and treatment of risk behaviors, including smoking and illicit drug use, during pregnancy. Educational and other programs to promote the continuation of good prenatal behaviors among the less acculturated also would be beneficial.

Research Recommendations

In this section we outline general research recommendations to address important methodological limitations and knowledge gaps in the field, as well as current research questions in specific areas.

PROMOTE THE USE AND IMPROVEMENT OF ACCULTURATION MEASURES AND THEORETICAL MODELS IN PUBLIC HEALTH RESEARCH A recent comprehensive review of acculturation theory, measurement, and applied research (25) summarizes general challenges in this area. The main measures used to measure acculturation (e.g., language, generation, self-reported ethnic identity) are at best proxy variables and do not fully capture the construct of acculturation. Also, unidimensional and unidirectional definitions of acculturation are used prevalently. These oversimplify a process that is at least bidimensional and more likely multidimensional.

Several research strategies could be used to address these gaps. There needs to be increased use of multidimensional statistical and other modeling techniques, such as path modeling and structural equations, that better comprehend the effects

of acculturation and differentiate between direct and indirect, or mediation, effects. The relationship between acculturation and specific outcomes may not be straightforward or unidirectional. For example, acculturation may shape how individuals gain access to care, whereas certain access-to-care characteristics (e.g., having insurance) may influence the overall effect of acculturation in health outcomes.

Public health researchers also should apply, and modify as necessary, existing theories to account for likely differences in the history, context, and prevalence of certain behaviors and illnesses among Latino subgroups as a possible way of exploring the impact of acculturation. Investigators should ask how much possible difference in the effects of acculturation experience across Latino subgroups—including Mexicans, Puerto Ricans, Cubans, and others—relates to individual characteristics of the respective subgroups, beyond the acculturation experience per se?

In addition, more research on the use, validity, and application of acculturation scales would be beneficial. For example, can the number of items in the most used and evaluated scales be decreased further without losing validity? What are the reliability and validity of currently available scales and future measures in non-Mexican Latino subgroups? What is the most effective and feasible way to operationalize nonlanguage domains of acculturation, such as values, attitudes, and behaviors?

FUND AND CONDUCT PUBLIC HEALTH RESEARCH TO ADDRESS AREA-SPECIFIC RESEARCH TO ANSWER EXISTING QUESTIONS ABOUT THE PHENOMENON AND EFFECTS OF ACCULTURATION AMONG LATINOS The following are examples of current research questions in the areas we reviewed.

Nutrition What are the relationships between acculturation and specific types of dietary intake by age group, in both Mexican-origin and non-Mexican Latino groups? Are such relationships linked to acculturation status and/or to dietary practices and behaviors (e.g., exercise) that promote physical health and prevent obesity? To what extent do favorable dietary patterns in the less acculturated ameliorate the negative effects of poverty and lower educational attainment?

Substance abuse, including drinking, smoking, and drug use Why are there gender differences in the acquiring of unhealthy behaviors as a result of acculturation? Are they related to gender-specific factors that also are associated with increased income and education, irrespective of ethnicity? Is there something specific about the context of immigrant Latina women's experiences in the United States? Is the phenomenon like the closing of the gap between women and men in other areas? If so, what are possible public health intervention points, both for prevention and for treatment?

Mental health What aspects of the acculturation process appear, in some studies, to lead to higher rates of depression among more acculturated Latinos? Do the apparent differences in prevalence and morbidity related to mental health

disorders among Latino subgroups reflect differences in acculturation experience, for instance, between Mexicans, Puerto Ricans, and Cubans? There is a need to tease out the differences between processes of acculturative stress versus adaptation to acculturative experiences. What is a mental health problem, and what is merely part of the normal process of adaptation? What are the roles of acculturative stress, context of immigration, and other important factors in the expression of mental illness among Latino immigrants?

Birth outcomes What is it about acculturation to U.S. norms among Latinas that leads to lower birthweights in their offspring, in spite of greater access to prenatal care? What are the relative contributions of smoking, illicit drug use, dietary changes, and other factors among more acculturated Latinas that lead to worse birth outcomes?

Effect of income and education What is the relative contribution of increased education for highly acculturated women, in terms of improving health outcomes among the most acculturated? Is there a U-shaped curve relationship? In other words, is acculturation associated with some undesirable health and behavioral outcomes until the individual attains a certain level of acculturation, and the effect levels off or decreases with increased educational and socioeconomic status?

Paradox of increased health care use with worse behavioral outcomes In reviewing the overall effects of acculturation on Latino outcomes, evidence to date, although not perfect, suggests that more acculturated Latinos have worse behavioral and birth outcomes but have more frequent health care use than do less acculturated Latinos. The reasons for this apparent paradox need to be understood. Does acculturation have a different effect on behaviors and health care use? In other words, do acculturated individuals have different attitudes and related behaviors about going to the doctor versus abusing alcohol, cigarettes, and illicit drugs? Alternatively, do unhealthy behaviors drive higher health care use among the more acculturated because these unhealthy behaviors lead to real disease, for which individuals then seek medical care? Or is acculturation associated with mixed effects? For example, language acquisition leads to higher SES through higher paying jobs; in this way acculturation is good for health. Yet there is also evidence that greater acculturation leads to worsening health behaviors and other risk factors, such as family disintegration, which may in turn be associated with unhealthy behaviors. A summary question might be, what is the net effect of acculturation on Latino health?

Perceptions of health The literature suggests that more acculturated Latinos perceive themselves as being in better health than less acculturated Latinos, in spite of having a trend toward certain worse health outcomes (51). Some of this apparent inconsistency of effect may be due to lack of study controls for important SES and health care–related factors and to a lack of multidimensional, consistent measures of acculturation (104). Yet it may also indicate that acculturation has opposite

effects with respect to access to care and health habits—including diet, exercise, and substance abuse—on the one hand, and with respect to actual disease burden, morbidity, and perception of health, on the other.

Related research questions include, is increased access to care among more acculturated Latino/as associated with more diagnosis of disease and more patient report of disease, and yet a sense of better health because medical care helps control symptoms? And/or does contact with a physician gives more acculturated patients a sense of more disease control, irrespective of real morbidity? Alternatively, does worse access to care by the less acculturated account for lower parent- or self-rated health because existing conditions are undertreated? In a recent study of socioeconomic status and health, Case and colleagues (21) showed that children with a health condition and higher SES had better parent-reported health status than did children with a health condition and lower SES. Higher socioeconomic status is presumed to provide more access to higher quality medical care. Or, is it possible that English and Spanish measures of parent- or self-rated health are not interpreted similarly by more and less acculturated individuals? Some research suggests that more and less acculturated persons respond to this measure differently for cultural or linguistic reasons (51, 71).

CONCLUSIONS

The phenomenon of acculturation in U.S.-residing Latinos is complex. Although more research in this area is clearly necessary, public health action based on the evidence that does exist would help promote the health of Latinos. For those areas where there is evidence that acculturation has a negative effect—substance abuse, dietary practices, and birth outcomes—a key public health issue is how to avoid the erosion of healthy behaviors among less acculturated Latinos to the population average of other groups. Alternatively, for those areas where the effect is mostly in the positive direction—health care use and self-perceptions of health—the questions are how to improve access to health care among less acculturated populations and how to understand the relationship between perceived health and actual health.

On the basis of our literature review, we presented specific recommendations in two general areas public health practice and research. The recommended public health and research actions depend on and supplement one another. Implementation and evaluation of public health interventions based on existing evidence would provide further direction to research aimed at understanding the complex and interrelated processes associated with acculturation and health among Latinos.

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