RESEARCH ARTICLE

Acculturation via Nature-Based Outdoor Recreation: A Comparison of Mexican and Chinese Ethnic Groups in the United States

Cassandra Y. Johnson, J. M. Bowker, H. Ken Cordell

This research considers acculturation by Mexican and Chinese groups in the United States and how participation in five nature-based outdoor recreation activities may be an indicator of acculturation to American society. We argue that the greater incidence of professional human capital among Chinese immigrants helps this group acculturate more quickly than Mexicans, who are more likely to be labor immigrants and that as a result, Chinese immigrants will be more likely than Mexican immigrants to participate in nature-based outdoor recreation activities. We also posit that US-born Chinese have a greater likelihood of participation compared to US-born Mexicans. Results show Chinese immigrant participation is distinguished only slightly from Mexican immigrant participation; no differences were found between US-born Chinese and US-born Mexicans. Within-group comparisons show immigrant Chinese participation to be more aligned with US-born Chinese participation than immigrant Mexican participation to US-born Mexican participation. Results from this study are intended to help raise awareness among environmental professionals of the different ways nature may be perceived by various cultural groups and also to alert managers of the important role natural resources can play in acculturating immigrants to US society.

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Between 1990 and 2000, the United States foreign-born population increased by 43%; not since 1930 has the immigrant population comprised such a large share—10.4%—of the US population (Schmidley, 2001, p. 9). This post-1965 immigration differs from the mass migrations at the turn of the twentieth century in that the majority of migrants to the US nowadays come from either Latin America or Asia, rather than from Europe (Schmidley, 2001). Latin-American immigrants comprise 53.3% of the foreign-born population and Asian immigrants 25% (US Census Bureau, 2004). Latinos (including persons of Mexican origin) are the fastest growing minority and have outpaced African Americans to become the largest ethnic minority in the country. Immigration, along with the relatively higher fertility rates among Latinos, contributes most to this growth.

In addition, the Asian-American population is growing faster than the population as a whole. Persons of Asian descent constituted 3.6% of the US population in 2000; this represents a 48% increase over 1990 figures (Barnes and Bennett, 2002). Assuming a moderate immigration rate for the next half century, Latinos and Asians will constitute nearly one-quarter of the US population by 2050 (National Research Council, 1997, pp. 11–115).

An extensive literature documents the assimilation process for Latino and Asian immigrants in various sectors of society, including work, education, and religion (Mundra, Moellmer, and Lopez-Aqueres, 2003; Sakamoto and Furuichi, 2002; Schneider and Ward, 2003; Xie and Goyette, 2003). Some of this literature also describes in detail outdoor recreation participation for Latinos (Chavez, 2001); however, comparatively little research considers immigrants—other than Latinos—and their relationship to the natural environment (Johnson et al., 2004; Johnson, Bowker, Cordell, 2004; Stodolska and Yi, 2003). In particular, little

Affiliation of authors: Cassandra Y. Johnson, Forestry Sciences Laboratory, US Department of Agriculture Forest Service, Athens, Georgia; J. M. Bowker, Forestry Sciences Laboratory, US Department of Agriculture Forest Service, Athens, Georgia; H. Ken Cordell, Forestry Sciences Laboratory, US Department of Agriculture Forest Service, Athens, Georgia

Address correspondence to: Cassandra Johnson, Research Social Scientist, Forestry Sciences Laboratory, USDA Forest Service, 320 Green St., Athens, GA 30602; (fax) 706-559-4266; (e-mail) cjohnson09@fs.fed.us.

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research documents how participation in certain nature-based outdoor recreation activities may help to acculturate these groups to American society (Dwyer, 1994; Floyd and Gramann, 1993; Shaull and Gramann, 1998; Stodolska, 2000; Yu and Berryman, 1996). This is due in large part to the lack of data on non-Latino immigrants.

This article examines the proposition that immigrant and ethnic group participation in certain nature-based activities may be an indicator of acculturation. Participation in these particular activities can be a way of assuming more of core, American culture. Participation itself does not constitute acculturation, because a group could engage in these activities but do them in such a way as to demonstrate their native culture rather than American culture (Carr and Chavez, 1993). We contend, however, that the very decision to participate in wildland activities suggests a degree of acceptance of core American beliefs about nature and the environment.

We selected five nature-based outdoor recreation activities for examination—birding, developed camping, primitive camping, hiking, and mountain biking. These were chosen because we believe they represent core activities that reflect middle-American culture grounded in nature and wilderness exploration (Hammond, 1985; Turner, 1953). We contend that acculturation via participation in these activities is not uniform across immigrant and ethnic minority groups but that some groups acculturate more quickly than others. The rate of acculturation depends to a great extent on human capital factors such as education level, occupational skills, wealth, exposure to mainstream American culture before entry into the US, and receptivity of the immigrant population by the host society (Portes and Rumbaut, 2001; Yu and Berryman, 1996). Portes and Rumbaut (2001) maintain that human capital aids occupational and economic adaptation to American society. We argue further that human capital factors also enhance integration along cultural lines because of the strong correlation between socio-economic status and cultural preferences.

We focus specifically on Mexican and Chinese populations, because these groups constitute the largest Latino and Asian ethnic groups, respectively, in the US. Of the Latino population in the US, Mexicans comprise 59.3%, representing 7.4% of the US population (Ramirez, 2004). Chinese make up 23.7% of the Asian-American population and 0.9% of the US population (Reeves and Bennett, 2004).

A number of studies have examined US-born ethnic group interaction with, and perceptions of, the natural environment (for a review see Floyd, 1999; Gramann and Allison, 1999). Studies typically show whites participating more often than minorities in most forms of nature-based outdoor recreation; however, we must not assume all racial and ethnic minorities participate to the same extent in outdoor recreation—i.e., white/non-white comparisons understate differences across groups (Floyd and Gramann, 1993; Gramann, 1996). There may be considerable variation in the outdoor recreation patterns and preferences for various US-born ethnic minorities. These differences may relate to ethnic subcultural norms about the environment and interaction with it, socio-economic standing, and place of residence, among other factors (Floyd, 1999). Floyd and Gramann (1993) argue that leisure behavior may be one means by which minorities maintain their ethnic distinctiveness, because leisure is less dictated by majority-culture norms. Conversely, the extent to which ethnic groups adopt traditional middle-American outdoor recreation behavior may indicate their acceptance of middle-American norms and values.

For immigrants, differences in outdoor recreation behavior may relate to structural factors such as language barriers, lack of discretionary funds, lack of appropriate settings or information about outdoor recreation resources, or perceived discrimination (Livengood and Stodolska, 2004; Stodolska, 2000). As discussed, differences also may be due to particular immigrant worldviews concerning nature and the human place within it.

The interaction between immigrant and ethnic populations and natural resource use is important for environmental professionals to consider because of the possibility of shifts in resource priorities related to cultural changes in the population. Non-European immigrant groups may have a different understanding of the human/nature relationship when compared with people of primarily Northern European descent in the US and Canada; these differences may influence political support for various protected areas' designations and resource use. Ensuring that immigrant and ethnic communities are both aware of and supportive of natural resource agendas should be a priority for environmental professionals because resource managers need to be able to draw from a wide constituency base in order to equitably promote and enforce sustainability directives.

Assimilation Theory

Classical assimilation theory comes from Robert Park in the 1920s and, later, Milton Gordon (Gordon, 1964; Park,

Burgess, and McKenzie, 1967). Park's ideas were inspired by European immigration of the late nineteenth and early twentieth centuries. Park used the "race-relations cycle" to describe contact between immigrants and the native-born. This process involves initial exposure of immigrants to the host society and, eventually, assimilation. When immigrants first enter a country, they establish contact with members of the host culture, compete for jobs and resources, reach a level of accommodation (both immigrants and native-born recognize the social position of immigrant), and eventually assimilate.

Acculturation is expected to occur before assimilation. Acculturation involves the adoption of cultural practices, including language acquisition, host country food consumption, and, we believe, recreational pursuits. Assimilation is a later stage that involves integration into a host country's institutions, such as economic and educational structures. The larger process of assimilation is assumed to be both inevitable and unidirectional, that is, immigrants take on the culture and integrate into dominant cultural and social structures.

Traditional assimilation theory has been criticized for a number of reasons, principally that it offers simplistic definitions of culture. The American culture Gordon (1964) referenced was largely white, Protestant, and middle-class. The content of contemporary middle-American culture is not so easily defined, however. The middle shifts continually and appropriates artifacts and expressions from the periphery (e.g., Andy Warhol's famous soup can is considered art, and "hip hop" is now a household term in suburbia).

Critics also charge that the absolutist explanations are less applicable to the post-1965 immigration because newer immigrants, who are primarily Latino and Asian, must contend with racism as well as assimilation (Portes and Zhou, 1993). In addition, the US economic structure has shifted from a mostly manufacturing to a more service-based economy. Immigrants of past generations with few skills and low education levels could find work in the industrial sector. Nowadays, low skill-level immigrants are employed more often in low-wage, service sector jobs that do not provide long-term security. Without economic security and the possibility for promotions, it is more difficult for these immigrants to assimilate, both culturally and structurally (Alba and Nee, 1997; Edmonston and Passel, 1994).

Portes and Rumbaut (1990, pp. 14–25) distinguish further between professional and labor migrants. Labor migrants enter a country to work in factory, agricultural, or service sector jobs. These workers generally have low education levels, but their skill levels may range from low to high depending upon vocational training in their home countries. Labor migrants in the US typically come from Latin America, with the largest contingency from Mexico. According to a report published by the American Immigration Law Foundation (Paral, 2002), the percentage of Mexican immigrant workers in the US workforce doubled between 1990 and 2000, increasing from 2% to 4%. The overwhelming majority of these workers are labor migrants working in economic sectors ranging from agriculture to hospitality.

Latin-American labor immigrants are more likely than others to come into well-established ethnic communities and to experience an indirect or delayed process of acculturation and assimilation because the ethnic culture acts as a buffer between the new immigrant and the host culture. Latin-American immigrants also are more likely to live in segregated neighborhoods or barrios where they have less social contact with whites (Michelson, 2003).

Professional immigrants, in contrast, have relatively high education and skill levels. They are trained professionals in science, technical, or managerial fields, recruited by US firms to fill positions for which there is a lack of qualified Americans. Foreign-born Asians are more likely than Latinos to be professional immigrants. More than 50% of Chinese (both US and foreign-born) are employed in management, professional, and related fields (Reeves and Bennett, 2004). This contrasts with only 34% for the general population (US Census Bureau, 2004). Unlike labor immigrants, professional immigrants are less likely to enter established ethnic enclaves because of their greater flexibility with respect to job location and high status occupations (Portes and Rumbaut, 1990).

We argue that acculturation for professional immigrants is achieved more quickly than for labor immigrants because the former are generally less bound by their native culture. This is not to say that native culture is less relevant for professional immigrants, but that it is counterbalanced by the marketable human and social capital that professional immigrants possess. These skills make it more likely that they will be exposed to middle-class Americans and American cultural norms.

Because Chinese immigrants are more likely to be professional rather than labor immigrants, we expect Chinese immigrant participation in nature-based outdoor recre-

ation to be greater than that of Mexican immigrants. We also believe US-born Chinese participation will exceed US-born Mexican activity. We believe that even among US-born ethnic groups, Chinese-American adaptation to core American behavior, including outdoor recreation, will exceed Mexican-American assumption of such values.

American Culture and Nature-Based Recreation

We consider nature-based outdoor recreation to exemplify American core culture because wildlands and wildland activities are considered by many to represent American ideals (Elbers, 1994; Henberg, 1994; Nash, 1967; Stegner, 1961; Taylor, 2000). Hammond (1985), for instance, argues that officially designated wilderness is beneficial because it contributes to a distinct American character and symbolizes American heritage. Nash (1967) and Oeschlaeger (1991) trace the origins of wildland appreciation to the latter half of the nineteenth century, specifically to the ideas of Ralph Waldo Emerson and John Muir, who embraced transcendentalism. Both Emerson and Muir believed that wild, natural places could help redeem modern man from the denaturalization caused by industrial society; however, both men drew clear distinctions between the natural world and civilization. The contemporary conceptualization of wilderness also contains this dichotomy. Note the language in the 1964 Wilderness Act: "A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain" (US Congress, 1964).

This polarized ontology does not necessarily hold across cultures. The "culture/nature" divide discussed by Haraway (1991) is less pervasive in industrializing nations and traditional societies (Callicott, 1994/95; Lynch, 1993). The very idea of nature-based outdoor *recreation* (as opposed to outdoor activities engaged in for sustenance) may be largely unfamiliar to Latino and Asian immigrants, because such activity is uncommon in their native countries. Yu and Berryman (1996), for instance, cite four cultural factors that distinguish Chinese and American recreation. Two of these are relevant for the present discussion: (1) Chinese view recreation as relaxing, passive engagement rather than as strenuous activity. This contrasts with many forms of wildland and wilderness-based recreation requiring much effort; and (2) outdoor recreation generally is not viewed positively by Chinese families.

In addition, nature-based outdoor recreation is linked to protected area reserves such as national parks. The national park concept has received mixed reviews in countries outside of North America, particularly in developing countries in Africa, Asia, and Latin America (Parajuli, 2001; Western, 2001). Critics charge that the North American conception of the national park, when exported to the developing world, disregards traditional cultures and native group rights to exist in protected areas (Guha, 1989).

Asians and Nature-Based Recreation

Hung's (2003) pioneering study looks at the perceptions and interactions of Chinese immigrants in Vancouver, British Columbia, with regard to wilderness recreation. Similar to studies conducted in the US examining the relationship of African Americans to wildland recreation (Washburne, 1978; Washburne and Wall, 1980), Hung (2003) surmised that the Chinese appreciate wild nature differently than white, North Americans. For instance, in traditional Chinese society, engaging in outdoor woodland activities is closely aligned along class lines—primarily with peasants who are most connected to wild nature because they must eke out some form of subsistence from the land. The modern, more Westernized Chinese, in contrast, distance themselves from undeveloped, wildland settings.

This is not to gainsay the traditional Eastern view of nature, which characterizes humans as existing harmoniously with the natural world (Giradot, Miller, and Xiaogan, 2001; Goodman, 1980). The difference in wildland engagement as described by Hung (2003) and the symbiosis espoused in the Taoist and Buddhist traditions seems to be a difference between a contemporary, secularized relationship to nature and a more philosophic (Eastern) stance. Communism contributed greatly to the former perspective by attempting to supplant centuries-old views of nature with more self-centered Western ideas that emphasize mastery over nature (Sodowsky et al., 1994). The Chinese also place much greater value on designed garden spaces than on wild nature. Hahn (2001), for instance, writes that the manicured gardens in Chinese mountain monasteries are examples of cultural distinctiveness for the Chinese and are analogous to the national park ideal for North Americans.

The extent to which Chinese groups in the US have adapted more Westernized appreciation for nature is a matter of empirical inquiry. Yu and Berryman (1996) note that Chinese adopt more Westernized forms of recreation when they immigrate. This is particularly true for younger im-

migrants and for those stemming from more Westernized Asian countries such as Taiwan and Hong Kong. But Allison and Geiger (1993) stress that researchers need to understand the meaning of leisure activities for persons of Chinese descent in the US. While the forms may be similar to mainstream, Westernized pursuits, individuals from different cultures may give the activities a different interpretation.

Wildland or nature-based recreation typically involves more individualistic or self-expressive behavior. This type of recreation contrasts with traditional Chinese values, which emphasize interdependence and less individualistic norms (Walker, Deng, and Dieser, 2001). As Yu and Berryman (1996) observed, these values seem to influence the types of recreation reported by immigrant high-school students from China. Yu and Berryman (1996) concluded that ethnic culture was still very influential in the lives of these youth after locating to the United States.

Latinos and Nature-Based Recreation

With respect to Latin-American environmentalism, Lynch (1993) proposes that people of Latin-American descent in the US hold a different perspective of the natural world as compared to whites. In contrast to the middle-American view of nature as separate from the individual and community, Latinos perceive humans to be intimately connected with their natural surroundings. According to Lynch (1993), Latino ontology also differs from mainstream American environmentalism in that the former does not distinguish people from the landscape. Latinos also see technology as linked with politics and the environment as part of cultural identity.

Compared to Anglo-Americans, Latino outdoor recreation tends to involve collective, family-oriented activities (Carr and Williams, 1993; Dwyer, 1994; Hutchison, 1987; Irwin, Gartner, and Phelps, 1990). Ethnic assimilation and selective acculturation theories provide the theoretical base for Shaull and Gramann's (1998) comparison of inter-ethnic (Latino/white) and intra-ethnic (least acculturated, bicultural, most acculturated) differences in perceived family-related and nature-related benefits of outdoor recreation. Shaull and Gramann (1998) posit that Latino outdoor leisure resists full acculturation as predicted by Gordon (1964) and is instead more reflective of a selective or partial acculturation process whereby immigrant groups retain key elements of their original culture—outdoor recreation behavior being an example.

Floyd and Gramann (1993) tested the hypothesis that more acculturated Mexican Americans would report recreation behavior most similar to whites of comparable socioeconomic standing. Results showed that the most acculturated group of Mexican Americans reported an average number of activities that was most similar to whites. Carr and Williams (1993) examined recreation meaning and style for Hispanic (Mexican American, Central American) and white recreationists visiting the San Bernardino and Angeles National Forests in California. The meaning attributed to forest recreation varied by acculturation level, with more acculturated Mexicans responding most similarly to whites.

In a study of both local and international visitors to El Yunque (Caribbean National Forest) in Puerto Rico, Pizzini, Latoni, and Rodríguez (1993) found domestic visitors appreciated utilitarian and spiritual features of the tropical forest more than international visitors, who stressed enjoyment of scenery. Visitation to the forest for locals was done primarily in family groups rather than individually. This finding reinforces the idea that Latino culture reflects familism, a strong emphasis on familial relationships, which is evidenced less in Anglo families. Other studies of outdoor recreation participation also reveal that Latinos, regardless of country of origin, are more likely to interact with nature in collective units, compared to North American whites (Dwyer, 1994; Gramann, 1996).

Research Hypotheses

This article rests on the assumption that participation in nature-based outdoor recreation activities can be an avenue towards acculturation for both immigrant and US-born ethnic groups. We maintain further that acculturation may be achieved more quickly for Chinese groups than for Mexican groups because of higher levels of human capital among the Chinese. To test this proposition, we examine whether Mexican and Chinese immigrants differ in their involvement in nature-based outdoor recreation activities.

We also make intra-group comparisons of Mexican- and Chinese-origin respondents, respectively. We test whether US-born respondents are more likely to participate in nature-based activities than their immigrant counterparts (e.g., US-born Mexicans compared to Mexican immigrants). We also assess the relationships between US-born whites and each ethnic group (both US- and foreign-born). Our research hypotheses follow:

H_1: Chinese immigrants are more likely than Mexican immigrants to participate in nature-based outdoor recreation activities.

H_2: US-born Chinese are more likely than US-born Mexicans to participate in nature-based outdoor recreation activities.

H_3: US-born Chinese are more likely than Chinese immigrants to participate in nature-based outdoor recreation activities.

H_4: US-born Mexicans are more likely than Mexican immigrants to participate in nature-based outdoor recreation activities.

H_5: Immigrant and US-born Mexican participation is least similar to US-born white participation.

Data Collection

Data for this study are from the *2000 National Survey on Recreation and the Environment* (NSRE) (Cordell, Green, and Betz, 2002; US Department of Agriculture Forest Service, 2000). The NSRE is the eighth version of the US National Recreation Surveys, which started in the 1960s. The current survey began in 1999 and ended in 2004. The NSRE is a random-digit-dial telephone survey of more than 80,000 households nationally. The sample was obtained from a listing of "working block" telephone exchanges supplied by Survey Sampling, Inc. A block consists of a set of 100 contiguous numbers identified by the first two digits of the last four numbers (e.g., in the number 231-5200, "52" is the block). Selected numbers are entered into a computer-aided telephone interviewing system, and potential respondents are chosen from these numbers.

The survey gathers information on a number of outdoor recreation and environmental topics, including outdoor recreation participation, environmental attitudes, natural resource values, attitudes toward natural resource management policies, household structure, lifestyles, and demographics. The data are weighted using post-stratification procedures to adjust for disproportionate age, racial, gender, education, and rural/urban strata (Cordell, Green, and Betz, 2002).

There are currently 18 versions of the NSRE; we report data from versions 1 through 14 (only these versions were available at the time of writing). Each version, except version 3, has approximately 5,000 observations and contains core participation questions relating to outdoor recreation activities and demographics. Demographic variables include race, ethnicity, year respondent came to the US (for foreign-born), age, education, and country of birth, among other variables. Selected versions also contain modules with questions specific to other issues such as wilderness valuation and management, knowledge and attitudes about prescribed fire and wildfire, forest management, or recreation fees.

Logistic Analysis

We use multivariate, logistic regression (Gujarati, 1988) to assess the effects of ethnicity and immigrant status on outdoor recreation participation. The logistic model estimates the probability that an individual will respond "yes" to each of the five activity items, holding constant various combinations of explanatory variables included in the model. Logistic models are non-linear, and the dependent variable is dichotomous, coded as a one or zero. We model the probability that a respondent answered "yes" (Y = 1) to each activity participation question. For example, the probability that a given individual participated in developed camping is:

$$\text{Prob (yes)} = 1/(1 + e^{-Z}), \tag{1}$$

where e is the base of the natural logarithm, and z is the product of a vector of $(k - 1)$ independent variables (x) and k parameters (b):

$$Z = b_1 + b_2x_2 + \cdots + b_kx_k, \tag{2}$$

(Greene, 2000, pp. 811–837; Gujarati, 1988, pp. 481–489). Logistic models are commonly used in social science research involving a wide array of social behavior ranging from environmental behavior to positions on political trust (Glasgow, 1995; Massey, 1987; Michelson, 2003; Petersen, 1985; Pfeffer and Stycos, 2002). A positive and significant sign on any of the estimated predictor variable coefficients indicates that the variable increases the individual's probability of responding "yes" to participation in a given activity.

We model participation in five outdoor recreation activities—birding, developed camping, primitive camping, hiking, and mountain biking. Activity questions were measured on a nominal scale. Respondents were asked whether they had engaged in each of these activities within the preceding

twelve months. They could answer "yes," "no," "don't know," or "refused." For modeling purposes, we assigned "yes" responses a value of one and "no" responses zero. "Don't know" and "refused" responses, which comprised less than 1% of observations, were coded as missing.

To test for differences among immigrant and US-born respondents, we include the following binary variables for each of the respective ethnic/immigration combinations: US-born Chinese (US born Chin.), Chinese immigrant (Chin. Imm.), US-born Mexican (US born Mex.), and Mexican immigrant (Mex. Imm.); US-born white is the base group. Gender, age, education, urban residence, and presence of children in the household are control variables. Female is coded one and male zero. Age is measured in number of years. Respondents with a Bachelor's degree or higher (educ.) are coded one and all others zero. Presence of children (child) is measured with a dichotomous variable that indicates whether children six years or younger reside in the household. Households with children less than seven years old were coded one and all others zero. Urban is coded one for residence in a metropolitan county as defined by the US census, and residence in non-metropolitan counties is coded zero.

The models comparing immigrant groups also include an elementary measure of acculturation to control for exposure to American culture. This variable (accult.) allows for a consideration of differences in participation among immigrants with different lengths of tenure in the US. Our attempt here is to isolate the effect of immigrant status on participation, regardless of time spent in the US. Recent studies have used similar measures to examine immigrant environmental behavior (Pfeffer and Stycos, 2002) and immigrant valuation of federally designated wilderness areas (Johnson et al., 2004). In the immigrant-only models (i.e., Chinese and Mexican immigrants), acculturation is calculated simply as the year the survey was administered minus the arrival year in the US. In the models containing both native-born and immigrant respondents, acculturation is an interactive term (immigrant times number of years in US). "Number of years in the US" is calculated the same as the acculturation variable above, but here, immigrants are assigned a value of one, and native-born respondents are coded zero; thus, all native-born values for this variable are zero.

Results

Before presenting the results of the logistic analysis, we first examine "human capital" among the five ethnic/racial groups. We use education as a proxy for human capital while realizing the limitations of a single variable to capture this construct. Data limitations do not permit a more inclusive assessment. Income is not included as a measure of human capital because of its high correlation with education level. Respondents with a Bachelor's degree or higher are considered to have a discretely higher level of human capital. Based on previously discussed literature, we expect both Chinese groups to have higher education levels than the Mexican groups.

Table 1 compares education levels for the two Chinese and Mexican groups and whites in the NSRE. Chinese immigrants report the highest educational attainment, with 80% reporting an education level of Bachelor's degree or higher. US-born Chinese have the next highest level, at roughly 46%. These figures compare with 48.1% (Bachelor's degree or higher) for persons of Chinese ethnicity in the US population, age 25 or over (Reeves and Bennett, 2004) (US Census reports do not disaggregate educational attainment for ethnic group members born in the US compared to those born in another country). In the NSRE, roughly 1.5% of Mexican immigrants have Bachelor's degrees or higher, compared to about 11.5% for US-born Mexican Americans. Approximately 8% of Mexican-origin individuals in the US population, age 25 or over, have comparable education levels (Ramirez, 2004). Twenty-five percent of US-born

Table 1. Bachelor's degree or higher for respondents aged 25 and over: percentages and standard deviations for Chinese immigrants, US-born Chinese, Mexican immigrants, US-born Mexicans, US-born whites, and overall sample

Ethnic/Racial Group	Sample Size	Percent Having Bachelor's Degree or Higher
Chinese immigrant	56	80.7 (48.9)
US-born Chinese	90	45.9 (78.2)
Mexican immigrant	804	1.6 (22.5)
US-born Mexican	820	11.6 (45.2)
US-born white	47,740	25.3 (38.6)
Total	49,510	23.5 (39.1)

Number in parentheses is standard deviation.
Source: US Department of Agriculture Forest Service, 2000.

whites in the NSRE have at least a four-year college degree.This compares with a 26% college completion rate for whites in the US population (US Census Bureau, 2001). Educational attainment as a measure of human capital indicates that Chinese and Mexicans in this study can be categorized as distinctly professional or labor immigrants.

Reduced-Form Model

The effect of human capital on outdoor recreation participation is examined first with a series of reduced-form, binary logit equations. This is a variation of the method described by McClendon (1994, pp. 291–294) and Alwin and Hauser (1975). Reduced-form models are specified for each activity and categorized by comparison group (e.g., US-born Chinese and Chinese immigrants; Mexican and Chinese immigrants). These models do not include human capital (education level). We next estimate full-form models that contain education level. We expect ethnic differences, as specified in the hypotheses, to appear in the first set of models. Ethnic differences are expected to diminish with the inclusion of education level in the full-form models.

Space limitations do not allow presentation of complete results from both the reduced and full-form models. Table 2 shows abbreviated results for the reduced-form models for each of the five comparison groups across all activities. Only the activity and ethnicity variables are shown. The first logistic models are for a subsample of only Mexican and Chinese immigrants. These models address our first hypothesis. Overall, 15% of immigrants, regardless of country of origin, participated in birdwatching; 11% develop camped; 4% went primitive camping; 61% hiked; and 21% rode mountain bikes. In addition to the binary ethnicity variable listed in Table 2 (Chinese immigrant=1), models also controlled for gender, age, residence, acculturation, and children in the home. The top of Table 2 shows that Chinese and Mexican immigrants differed significantly for

Table 2. Logistic regression estimates: reduced-form models

Activity (dependent variable)	Birding+	Developed Camping	Primitive Camping	Hiking	Mountain Biking+
Chinese and Mexican Immigrants					
Chin. Imm. (parameter estimate)	1.09**	0.55	0.71	−1.01**	0.04
% participating	15	11	4	61	21
N	1,019	1,056	1,056	1,055	1,035
US-Born Chinese and US-Born Mexicans					
US-born Chin. (parameter estimate)	0.04	−0.27	−0.59**	0.05	0.08
% participating	23	33	18	37	24
N	1,373	1,376	1,376	1,375	1,318
US-Born Chinese and Chinese Immigrants					
US-born Chin. (parameter estimate)	−0.69	0.90	0.26	0.11	0.69
% participating	25	23	10	39	20
N	199	199	199	200	189
US-Born Mexicans and Mexican Immigrants					
US-born Mex. (parameter estimate)	0.50**	1.67**	1.46**	−1.21**	−0.06
% participating	19	24	12	48	23
N	2,196	2,236	2,236	2,233	2,167
US-Born Whites and Other Ethnic Groups					
US-born Chin. (parameter estimate)	−0.59**	−0.38**	−0.93**	−0.01	−0.30*
Chin. Imm.	0.05	−1.50**	−1.47**	−0.02	−0.44
US-born Mex.	−0.64**	−0.15**	−0.42**	−0.11**	−0.43**
Mex. Imm.	−0.98**	−1.82**	−1.87**	0.91**	−0.44**
% participating	38	31	19	38	23
N	50,954	55,192	55,188	55,129	52,914

+Sample sizes for birding and mountain biking are smaller than for the other activities because these variables were not included in the *2000 National Survey on Recreation and the Environment* (US Department of Agriculture Forest Service, 2000) versions 12 and 3, respectively. These lower sample sizes further affected the sample for Mexican-origin respondents because Hispanics were not sampled in versions 12 and 14.

*$p \leq 0.05$.

**$p \leq 0.01$.

only two of the five activities, birding and hiking. Chinese immigrants were significantly more likely to birdwatch ($p \leq 0.01$) than Mexican immigrants. Chinese immigrants were less likely than Mexican immigrants to hike ($p \leq 0.01$).

In the US-born Chinese and US-born Mexicans sample, significant differences were found only for primitive camping ($p \leq 0.01$). US-born Chinese were less likely to go primitive camping, compared to their Mexican counterparts. No significant differences were found between foreign-born and US-born Chinese respondents for any activity; however, US-born Mexicans differed from Mexican immigrants for four of the five activities. US-born Mexican respondents were more likely to birdwatch ($p \leq 0.01$), develop camp ($p \leq 0.01$), and primitive camp ($p \leq 0.01$) but less likely to go hiking ($p \leq 0.01$).

The last set of models shows results for the sample of US-born whites and the ethnic groups. Chinese immigrants and US-born Chinese differed from US-born whites for six activities. In each case, the Chinese groups were less likely to participate. The combined Mexican sample differed from US-born whites for all activities. Mexican-origin respondents were less likely to participate in all activities except hiking, in which Mexican immigrants were more likely to engage than US-born whites.

Full-Form Models

Chinese and Mexican Immigrants

Table 3 contains results for the full-form models for Chinese and Mexican immigrants. Full-form model results include regression coefficient estimates, odds ratios, sample means of independent variables, overall percent participating in activity, and measures of goodness-of-fit. Again, significant differences in participation probabilities between Chinese and Mexican immigrants are observed for birding and hiking. Chinese immigrants are significantly more likely than Mexican immigrants to participate in birding ($p \leq 0.01$), but less likely to go hiking ($p \leq 0.05$). The odds ratio column shows that the odds of birding for a Chinese immigrant are 2.85 times that of a Mexican immigrant but only 0.46 that of a Mexican immigrant for hiking, holding other variables at sample means.

Table 3. Logistic regression estimates: Chinese and Mexican immigrants—activity participation

Activity (dependent variable)		Birding+		Developed Camping		Primitive Camping		Hiking		Mountain Biking+	
	Sample Mean	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++
Intercept		−2.04**		−1.55**		−0.70		−0.02		−0.48*	
Chin. Imm.	0.03	1.05**	2.85	−0.27	0.77	0.41	1.51	−0.78**	0.46	−0.16	0.86
Female	0.47	0.09	1.10	−0.17	0.84	−1.17**	0.31	0.09	1.09	−0.61**	0.54
Educ.	0.04	0.08	1.08	1.22**	3.38	0.57	1.77	−0.36	0.70	0.34	1.40
Age	38.00	0.04	1.01	−0.04**	0.96	−0.08**	0.92	0.02**	1.02	−0.04**	0.96
Urban	0.88	−0.11	0.89	0.07	1.08	−0.10	0.91	−0.07	0.94	−0.13	0.88
Accult.	13.00	0.001	1.00	0.03**	1.03	0.01	1.01	−0.02**	0.98	−0.01	0.99
Child.	0.35	0.20	1.22	0.73**	2.08	0.76**	2.14	0.37**	1.45	−0.01	0.99
% participating		15		11		4		61		21	
N		1,019		1,056		1,056		1,055		1,035	
Model chi-squared		22.93		108.77		113.51		74.55		185.62	
Significance level		0.002		<0.0001		<0.0001		<0.0001		<0.0001	
% correct predictions		54.9		64.4		70.6		61.0		63.0	

+Sample sizes for birding and mountain biking are less than the other activities because these variables were not included in the *2000 National Survey on Recreation and the Environment* (US Department of Agriculture Forest Service, 2000) versions 12 and 3, respectively. These lower sample sizes further affected the sample for Mexican-origin respondents because Hispanics were not sampled in versions 12 and 14.

++The odds ratio is the ratio of an event occurring for one group to the odds of an event taking place for another group, e.g., the odds of participation for Chinese immigrants to that of US-born Chinese. The odds ratio is specified as $odds = p/(1-p)/q/(1-q)$, where p and q are probabilities of participation associated with the two groups.

*$p \leq 0.05$.

**$p \leq 0.01$.

In the developed camping model, more educated, more acculturated individuals, and those with children in the home are more likely to participate, whereas older respondents are less likely to do so. For primitive camping, females are less likely than males to primitive camp, other factors equal. Increasing age also results in lower likelihood of primitive camping, but presence of children in the home increases the likelihood. Older respondents and those with children are more likely to say they participated in hiking. More acculturated immigrants were less likely to say they went hiking. Women and older respondents were also less likely to say they went mountain biking.

To assess substantive differences between Chinese and Mexican immigrants, we can calculate the probability of a "yes" response for participation in any of the activity variables. This can be done by specifying values for the sociodemographic variables listed in Table 3 and solving for Equations 1 and 2. The probability of birdwatching would be 0.33 for a 30-year-old Chinese male immigrant, with education level at Bachelor's degree or higher, urban dweller, with residence in the US for 15 years, and young children in the home. The probability for a Mexican immigrant with a similar demographic profile is 0.17. For this activity, differences between Chinese and Mexican immigrants are important both statistically and substantively.

US-Born Chinese and US-Born Mexicans

Table 4 contains results for US-born Chinese and Mexican ethnic groups. There were no significant ethnic differences except for developed and primitive camping, with US-born Chinese being less likely to participate than US-born Mexicans. Women were more likely to birdwatch but less likely than men to say they primitive camped or went mountain biking; those with higher education were more likely than those with less education to birdwatch, develop camp, hike, or mountain bike. Older persons were less likely to participate in developed camping, primitive camping, and mountain biking. Those with young children were less likely to primitive camp or go mountain bike riding.

US-Born Chinese and Chinese Immigrants

Table 5 shows full-form model results for US-born Chinese and Chinese immigrants. Here, significant differences were observed between the Chinese groups for developed camp-

Table 4. Logistic regression estimates: US-born Chinese and US-born Mexicans

Activity (dependent variable)		Birding+		Developed Camping		Primitive Camping		Hiking		Mountain Biking+	
	Sample Mean	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++
Intercept		−1.85**		−0.26		0.01		−0.60**		0.26	
US-born Chin.	0.11	−0.10	0.91	−0.43*	0.65	−0.66**	0.52	−0.19	0.83	−0.13	0.88
Female	0.51	0.30**	1.36	0.001	1.22	−0.56**	0.57	−0.14	0.87	−0.37**	0.69
Educ.	0.12	0.48**	1.61	0.51**	1.67	0.26	1.29	0.80**	2.23	0.72**	2.06
Age	37.00	0.003	1.00	−0.02**	0.99	−0.03**	0.97	−0.003	1.00	−0.04**	0.96
Urban	0.88	0.19	1.21	−0.05	0.95	−0.29	0.75	0.16	1.17	0.01	1.01
Child.	0.24	0.07	1.07	0.06	1.06	−0.37**	0.69	−0.08	0.92	−0.38**	0.68
% participating		23		33		18		37		24	
N		1,373		1,376		1,376		1,375		1,318	
Model chi-squared		23.61		52.88		121.74		49.26		189.79	
Significance level		<0.0006		<0.0001		<0.0001		<0.0001		<0.0001	
% correct predictions		54.0		52.8		63.9		58.9		64.0	

+Sample sizes for birding and mountain biking are smaller than for the other activities because these variables were not included in the *2000 National Survey on Recreation and the Environment* (US Department of Agriculture Forest Service, 2000) versions 12 and 3, respectively. These lower sample sizes further affected the sample for Mexican-origin respondents because Hispanics were not sampled in versions 12 and 14.

++The odds ratio is the ratio of an event occurring for one group to the odds of an event taking place for another group, e.g., the odds of participation for Chinese immigrants to that of US-born Chinese. The odds ratio is specified as $odds = p/(1-p)/q/(1-q)$, where p and q are probabilities of participation associated with the two groups.

*$p \leq 0.05$.

**$p \leq 0.01$.

Table 5. Logistic regression estimates: US-born Chinese and Chinese immigrants

Activity (dependent variable)		Birding+		Developed Camping		Primitive Camping		Hiking		Mountain Biking+	
	Sample Mean	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++
Intercept		−3.45**		0.12		−1.20		0.39		−3.28*	
US-born Chin.	0.74	−0.69	0.50	1.17*	3.22	0.23	1.26	0.39	1.47	0.85*	2.34
Female	0.52	1.07**	2.90	−0.17	0.85	−0.83*	0.44	0.36	1.43	0.74**	2.09
Educ.	0.44	−0.01	0.99	1.01**	2.75	−0.10	0.91	1.13**	3.09	0.71**	2.03
Age	37.00	0.03**	1.04	−0.04**	0.96	−0.03*	0.97	−0.03**	0.97	−0.04**	0.96
Urban	0.96	0.81	2.25	−1.50*	0.22	0.25	1.29	−0.68	0.51	1.80	6.03
Accult.	10.41	0.01	1.01	−0.03	0.97	−0.07	0.93	−0.004	1.00	0.05**	1.05
Child.	0.10	0.40	1.49	1.67**	5.34	0.07	1.08	−0.04	0.96	0.52	1.68
% participating		25		23		10		39		20	
N		199		199		199		200		189	
Model chi-squared		37.12		66.75		14.00		43.71		36.65	
Significance level		<0.0001		<0.0001		<0.0511		<0.4700		<0.0001	
% correct predictions		65.9		73.1		66.0		58.1		66.2	

+Sample sizes for birding and mountain biking are smaller than for the other activities because these variables were not included in the *2000 National Survey on Recreation and the Environment* (US Department of Agriculture Forest Service, 2000) versions 12 and 3, respectively. These lower sample sizes further affected the sample for Mexican-origin respondents because Hispanics were not sampled in versions 12 and 14.

++The odds ratio is the ratio of an event occurring for one group to the odds of an event taking place for another group, e.g., the odds of participation for Chinese immigrants to that of US-born Chinese. The odds ratio is specified as $odds = p/(1-p)/q/(1-q)$, where p and q are probabilities of participation associated with the two groups.

*$p \leq 0.05$.

**$p \leq 0.01$.

ing and mountain bike riding. Women were more likely than men to go birding and mountain bike riding but less likely to say they participated in primitive camping. As with other groups, older respondents were more likely to birdwatch. Older persons were less likely to develop camp, primitive camp, hike, or mountain bike ride. More acculturated Chinese were more likely to mountain bike ride and those with young children were more likely to develop camp.

US-Born Mexicans and Mexican Immigrants

Similar to the reduced-form model, this model also showed significant differences between US-born Mexicans and Mexican immigrants for four activities—birding, developed camping, primitive camping, and hiking (Table 6). Again, US-born respondents were more likely to engage in each of these activities except hiking. Women were less likely than men to primitive camp and mountain bike but more likely to birdwatch. Those with a Bachelor's degree or higher were more likely to engage in all activities. Older respondents were less likely to develop camp, primitive camp, and mountain bike but more likely to hike. Respondents living in urban areas were less likely to say they went primitive camping, and more acculturated Mexican immigrants were more likely to develop camp but less likely to primitive camp, hike, or mountain bike. Also, respondents with children in the home were more likely to develop camp and hike but less likely to go mountain biking.

The predicted probability of birding for a 60-year-old, US-born Mexican female, no children, college educated, with residence in an urban area, would be 0.57. The likelihood is 0.47 for a Mexican immigrant who has been in the US for 40 years. For hiking, the probability is 0.51 for a 45-year-old, US-born Mexican male with college education and urban residence. The probability increases to 0.78 for a 45-year-old, male immigrant with residence in the US for 16 years.

US-Born Whites and Other Ethnic Groups

Full logistic models comparing US-born whites to the other four groups are presented in Table 7. Again, there were significant differences between whites and Mexican-origin respondents (both immigrant and US-born) across all ac-

Table 6. Logistic regression estimates: US-born Mexicans and Mexican immigrants

Activity (dependent variable)		Birding+		Developed Camping		Primitive Camping		Hiking		Mountain Biking+	
	Sample Mean	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++
Intercept		−2.07**		−1.92**		−1.38**		0.29*		0.50**	
US-born Mex.	0.45	0.47**	1.60	1.64**	5.14	1.44**	4.21	−1.24**	0.29	−0.10	0.91
Female	0.49	0.15*	1.16	−0.05	0.95	−0.67**	0.51	−0.07	0.94	−0.59**	0.55
Educ.	0.05	0.52**	1.69	0.54**	1.72	0.39*	1.47	0.47**	1.61	0.58**	1.79
Age	38.00	0.002	1.00	−0.02**	0.98	−0.03**	0.97	0.01**	1.01	−0.04**	0.96
Urban	0.87	0.02	1.02	0.02	1.02	−0.30*	0.74	0.07	1.07	−0.09	0.91
Accult.	13.2	0.002	1.00	0.01*	1.01	−0.03*	0.97	−0.01**	0.99	−0.01*	0.99
Child.	0.31	0.12	1.13	0.27**	1.31	−0.04	0.96	0.17**	1.19	−0.18*	0.83
% participating		19		24		12		48		23	
N		2,196		2,236		2,236		2,233		2,167	
Model chi-squared		56.61		493.89		461.98		387.44		372.18	
Significance level		<0.0001		<0.0001		<0.0001		<0.0001		<0.0001	
% correct predictions		59.1		67.5		74.1		64.1		64.5	

+Sample sizes for birding and mountain biking are smaller than for the other activities because these variables were not included in the *2000 National Survey on Recreation and the Environment* (US Department of Agriculture Forest Service, 2000) versions 12 and 3, respectively. These lower sample sizes further affected the sample for Mexican-origin respondents because Hispanics were not sampled in versions 12 and 14.

++The odds ratio is the ratio of an event occurring for one group to the odds of an event taking place for another group, e.g., the odds of participation for Chinese immigrants to that of US-born Chinese. The odds ratio is specified as $odds = p/(1-p)/q/(1-q)$, where p and q are probabilities of participation associated with the two groups.

*$p \leq 0.05$.

**$p \leq 0.01$.

tivities. US-born Chinese were less likely than whites to participate in four activities—birding, developed camping, primitive camping, and mountain biking. Chinese immigrants were less likely than whites to say they went developed camping, primitive camping, hiking, and mountain biking.

An examination of practical differences in participation between whites and the ethnic groups demonstrates how the various groups compare *vis-à-vis* whites. For birding, the probability of participation would be 0.38 for a white, US-born, 30-year-old female, education level at Bachelor's degree or higher, living in an urban environment with young children. The probability is 0.25 for a US-born Mexican, 0.20 for a Mexican immigrant in the US for ten years, 0.35 for a Chinese immigrant with ten years in the country, and 0.24 for a US-born Chinese.

The probability of hiking is 0.32 for a white male, age 45, living in a non-urban area with education at less than a Bachelor's degree, and children in the home. The probability was 0.30 for a US-born person of Chinese heritage, 0.32 for a US-born Mexican male, 0.24 for a Chinese immigrant with an acculturation score of five, and 0.55 for a Mexican immigrant with the same tenure in the US.

Discussion

This investigation considers whether participation in nature-based outdoor recreation activities offers a method of assimilation for non-native and ethnic minority groups in the US. Specifically, we examined the likelihood of participation by Chinese-origin and Mexican-origin groups. The higher incidence of human capital among Chinese ethnic groups is believed to accelerate the acculturation process for this group. When Chinese immigrants and US-born Chinese were compared to their Mexican counterparts in the reduced-form models, results showed little evidence that respondents of Chinese descent (either US-born or immigrant) were more acculturated than Mexican-origin respondents to US society. Again, the reduced-form models showed only minor differences for US-born Chinese and Mexican groups and no intra-cultural differences for foreign-born and US-born Chinese. Differences were observed for US-born Mexicans and Mexican immigrants,

Table 7. Logistic regression estimates: US-born whites and other ethnic groups

Activity (Dependent Variable)		Birding+		Developed Camping		Primitive Camping		Hiking		Mountain Biking+	
	Sample Mean	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++	Maximum Likelihood	Odds Ratio++
Intercept		1.38**		0.30**		0.61**		0.28**		0.46**	
US-born Chin.	0.01	−0.66**	0.52	−0.39**	0.68	−0.94**	0.39	−0.11	0.89	−0.39**	0.68
Chin. Imm.	0.002	−0.14	0.87	−1.54**	0.21	−1.48**	0.23	−0.47**	0.62	−0.66**	0.52
US-born Mex.	0.05	−0.58**	0.56	−0.14**	0.87	−0.41**	0.66	−0.02	0.98	−0.35**	0.71
Mex. Imm.	0.06	−0.87**	0.42	−1.80**	0.17	−1.87**	0.16	1.05**	2.87	−0.33**	0.72
Female	0.51	0.25**	1.28	−0.11**	0.89	−0.74**	0.48	−0.26**	0.77	−0.42**	0.66
Educ.	0.20	0.45**	1.56	0.09**	1.10	0.03	1.03	0.64**	1.90	0.57**	1.77
Age	44.00	0.01**	1.02	−0.02**	0.98	−0.03**	0.97	−0.02**	0.98	−0.04**	0.96
Urban	0.77	−0.07**	0.93	−0.10**	0.91	−0.36**	0.70	−0.04	1.00	0.12**	1.12
Accult.	13.01	−0.01	0.99	0.01**	1.01	−0.03*	0.97	0.01	1.01	−0.01	0.99
Child.	0.14	−0.05	0.95	0.13**	1.14	−0.09**	0.92	−0.13**	0.88	−0.04	0.96
% participating		38		31		19		38		23	
N		50,954		55,192		55,188		55,129		52,914	
Model chi-squared		1982.68		2794.86		4443.80		3166.79		4711.52	
Significance level		<0.0001		<0.0001		<0.0001		<0.0001		<0.0001	
% correct predictions		61.3		61.9		69.2		63.4		69.4	

+Sample size for birding and mountain biking are less than the other activities because these variables were not included in the *2000 National Survey on Recreation and the Environment* (US Department of Agriculture Forest Service, 2000) versions 12 and 3, respectively. These lower sample sizes further affected the sample for Mexican-origin respondents because Hispanics were not sampled in versions 12 and 14.

++The odds ratio is the ratio of an event occurring for one group to the odds of an event taking place for another group, e.g., the odds of participation for Chinese immigrants to that of US-born Chinese. The odds ratio is specified as $odds = p/(1-p)/q/(1-q)$, where p and q are probabilities of participation associated with the two groups.

*$p \leq 0.05$.

**$p \leq 0.01$.

however. In addition, results for the two Mexican-origin groups differed more from US-born whites than did the Chinese subgroups. Our findings show support only for hypotheses 4 and 5. It should be noted, though, that the small sample sizes for the Chinese groups may mask differences among the foreign-born and US-born in this subsample. Also, the relatively small sample sizes for the Chinese groups may obscure differences between whites and US-born and immigrant Chinese.

Contrary to expectations, the reduced and full-form models did not differ substantially for any of the subgroups. The inclusion of a human capital proxy did little to change associations between the subgroups and the dependent variables. This may be attributed to the imprecise measure of human capital used in this study or to the lack of association generally between human capital and outdoor recreation participation. Because of only slight variations in the reduced and full-form models, the following discussion will focus on the full-form models.

In terms of intra-ethnic comparisons, overall Chinese participation appeared somewhat more aligned, compared to the Mexican sample. Traditional Chinese society is noted for its clannishness and ethnic solidarity (Kwong, 1996). Kwong (1996) discusses the hegemonic class structure among Chinese in New York's Chinatown, but also suggests that the various classes have more in common than not. As Kwong (1996) notes, the Chinese are culturally distinctive in that when they immigrate they tend to remain loyal to their original culture, while at the same time taking on particular cultural practices of the host society. This is consistent with our findings showing that both immigrant and US-born Chinese activities are not significantly different than US-born white activities. At the same time, our findings suggest a cohesiveness between foreign-born and US-born Chinese groups, with respect to participation in nature-based outdoor recreation activities. Again, the lack of significant differences between Chinese immigrants and native-born Chinese may relate to the relatively small numbers of Chinese in the sample.

It may be that both immigrant and US-born Chinese maintain a connectedness while adopting core American behavior, while for Mexican groups, the assumption of American values may necessitate a cultural split between the US-born and immigrants. More variation in participation was found between US-born Mexicans and Mexican immigrants. This is contrary to expectations. We hypothesized that because of greater ethnic exclusivity among Mexican-origin respondents, their recreation participation would be less divergent. Perhaps there are more distinctions between lesser and more acculturated Mexicans compared to Chinese. As Floyd and Gramann (1993) found, more acculturated Mexicans selected outdoor recreation activities most similar to whites.

Results for Mexican groups also indicate that, as a collective, immigrant and US-born Mexicans offer the most resistance to acculturation when measured by participation in nature-based activities. These results are consistent with research in other areas showing that Mexican-origin groups exhibit more resistance to acculturation. Whether this has to do with socio-economic factors (i.e., higher incidence of labor migrants) or cultural factors is not clear. It is likely that both factors exert influence. Our findings concerning Mexican groups may again relate to sample size. Compared to the Chinese samples, the larger Mexican group samples may allow for observation of more participation distinctions.

Issues surrounding acculturation and integration have taken on more importance and urgency with the dramatic rise in immigrant population. This article is intended to help make environmental professionals more aware of the growing immigrant and non-Euro-American population and the need to establish constituencies within this population. Most of the scholarship focusing on these groups has neglected issues surrounding natural resource use and perception; however, immigrant use of natural outdoor areas and their familiarity with the oftentimes contentious issues involved with such lands is important to understand. The present research represents only a first step in clarifying how different immigrant and ethnic groups engage with nature.

If nature-based outdoor recreation is one means by which immigrants and other non-white groups integrate more fully into American society, then the question for natural resource practitioners should be: How can resource managers help facilitate this process? To assist non-traditional groups in outdoor recreation participation, managers need to be aware of barriers encountered by these groups that may not exist for traditional participants. For instance, English-only interpretive displays and other signs or brochures at outdoor sites frequented by large numbers of recently immigrated, non-English-speaking visitors would be a hindrance to these visitor groups. There may be other off-site barriers such as a lack of public transportation to regional recreation sites; immigrants are probably less likely than US-born citizens to have personal transportation and thus would rely more heavily on public transportation. Where practical, resource agencies could help to ensure that public transportation routes are established from ethnic communities to resource areas.

In addition, managers should be cognizant of the different recreation styles of various groups and the need to design recreation facilities, where appropriate, to accommodate varying group sizes. As mentioned, Latino culture strongly emphasizes family solidarity and extended family and friendship networks. This ethnic element is reflected in the recreation styles of Latino outdoor recreation visitors. Latinos typically recreate in larger groups than whites and their activities may be less strictly defined. This type of information is important for managers to consider when designing recreation spaces for visitor groups and deciding which recreation amenities to provide.

More importantly, however, resource managers need to understand the significance or meaning of leisure in the lives of immigrant and ethnic communities (Allison and Geiger, 1993). Implicit in the management philosophies of public recreation agencies is the American ideal of individualistic wilderness exploration—the individual encountering nature alone. As discussed, this cultural ideal is not prevalent among non-European immigrant groups, despite the fact that these groups may engage in nature-based outdoor recreation. Although non-European immigrant groups may use certain outdoor recreation activities as a way to become more acculturated, their participation may at the same time represent a means of expressing their original culture. It is imperative that resource managers understand how various ethnic groups use natural resources to reinforce native norms and also to integrate into mainstream American culture. This understanding will help ensure equitable distribution of our nation's valued natural resources.

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