

Physical Activity Constraints among Latinos: Identifying Clusters and Acculturation Differences

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Abstract:

Understanding leisure-time physical activity among Latinos is a national public health concern. This study examined constraints to leisure-time physical activity among Latinos in North Carolina in relation to their level of acculturation. Data (N = 457) were obtained through a community survey. Four subgroups with similar constraints were identified using cluster analysis: Access and Partner Constrained, Safety and Access Constrained, Least Constrained, and Highly Constrained. Results showed that low acculturation was significantly associated with being highly constrained. Latinos born outside the U.S. were more likely to be classified as Access and Partner Constrained and Safety and Access Constrained. The findings contribute to understanding constraints in the context of acculturation and offer practitioners perspective on creating physical activity programs for Latinos.

Keywords: Latinos | constraints | physical activity | recreation | acculturation

Article:

Understanding leisure-time physical activity among Latinos is a national public health concern. Latinos are currently the largest minority group in the U.S., comprising approximately 16.3% of the total population (Pew Hispanic Center, 2011). Moreover, between 2000 and 2010, the total Latino population grew by 43% and accounted for a large portion of the national growth (Pew Hispanic Center). National studies indicate that Latinos have lower levels of leisure-time physical activity than Caucasians and African-Americans (Marquez, Neighbors, & Bustamente, 2010). Moreover, reports based on the 2005 Behavioral Risk Factor Surveillance System survey showed that Latinos are less likely than Non-Hispanic Whites to meet national recommendations for physical activity (Centers for Disease Control and Prevention, 2007). Specifically, Latino men (41.9%) and women (40.5%) reported lower prevalence of regular daily physical activity

than their non-Hispanic White male (52.3%) and female (49.6%) counterparts. These trends are cause for concern given the known and well documented physiological and psychological benefits of regular physical activity (Healthy People 2020, 2011). Reduced risk of cardiovascular diseases, some forms of cancer, non-insulin-dependent diabetes mellitus (type 2 diabetes), osteoporosis, depression, and obesity is associated with regular or routine physical activity (U.S. Department of Health and Human Services, 2000). Low levels of physical activity among Latinos put them at greater risk for these and other chronic diseases.

Despite their low levels of leisure-time physical activity, Latinos reported higher levels of occupational physical activity patterns compared to non-Hispanic Blacks and Whites (Marquez et al., 2010). However, occupational physical activity may not provide the same physical health benefits as leisure-time physical activity (Sofi et al., 2007). Sofi et al. found that higher levels of leisure-time physical activity resulted in lower and more favorable levels of body mass index (BMI), diastolic blood pressure, HDL cholesterol, and triglycerides. However, no associations were found between occupational physical activity and these health risk indicators, suggesting that occupational physical activity and leisure-time physical activity may not yield the same benefits. As a result, Latinos whose physical activity patterns are dominated by occupational requirements may not be getting the physiological and psychological health benefits associated with leisure-time physical activity (Marquez et al., 2011). Therefore, given the immediate and long-term benefits of physical activity participation, understanding constraints to physical activity among Latinos is an important research need (Woodward-Lopez & Flores, 2006).

Leisure constraints research may be particularly useful for understanding physical activity patterns among Latino populations. Over the past two decades, the study of constraints has broadened theoretical perspective on a number of concerns important to leisure scholars, including formation of leisure preferences, actual leisure participation, leisure satisfaction, and constraint negotiation (Jackson & Scott, 1999). A fundamental contribution of constraints research has been to identify specific categories of barriers and inhibitors and how they condition leisure behaviors or experiences (Crawford, Jackson, & Godbey, 1991). Identifying the nature of constraints provided perspective on how leisure service providers can help individuals and groups negotiate constraints (Scott & Mowen, 2010). In particular, constraints research can be used strategically to tailor physical activity programs or environmental interventions according to specific patterns or types of constraints experienced among Latinos.

In this study, we examined patterns of perceived constraints to leisure-time physical activity within a sample of Latinos. Further, we acknowledged that Latinos, like other ethnic minority groups, are not a homogenous population. Therefore, we also explored how patterns of constraints to leisure-time physical activity among Latinos were related to their levels of acculturation.

Constraints within Leisure Research

Understanding the fundamental barriers to participation in leisure and recreation has been the foundation of constraint-related research (Searle & Jackson, 1985). Initial constraints research focused primarily on factors that intervened between preferences and participation (Jackson & Scott, 1999). As Scott, Lee, Lee, and Kim (2006) noted, barriers conceptualized as physical and external to the individual were the main concern in these studies. Subsequently, Crawford and Godbey (1987) «conceptualized the influence of constraints on preferences and participation. They offered a model in which constraints exert influence on the formation of leisure preferences and actual participation. Constraints theory included three types of constraints (intrapersonal, interpersonal, and structural) that affect leisure preferences and participation (Crawford & Godbey). Intrapersonal constraints were conceived as impacting formation of preferences and refer to psychological states and attributes, such as perceived skill, abilities, and attitudes. Interpersonal constraints were suggested to arise from interactions with peers, friends and family, and potential co-participants. Structural constraints were posited as externally imposed barriers that intervene between preference and participation, such as the unavailability of resources required to participate (e.g., money, time, problems with facilities, and social/geographic isolation). In further elaboration of the model, perceived constraints were assumed to be hierarchical, suggesting that intrapersonal and interpersonal constraints affect leisure preferences (e.g., what activities to choose), whereas structural constraints intervene between preferences and participation (Crawford, Jackson, & Godbey, 1991).

It is important to recognize that ethnic groups, particularly those with large immigrant composition, such as Latinos, have encountered constraints to leisure that are different from the general population (Scott et al., 2006). Previous studies have shown that immigrants experienced a range of constraints, such as language barriers, lack of time and money, discrimination, and lack of awareness about possible leisure opportunities (Livengood & Stodolska, 2004; Stodolska, 1998; Yu & Berryman, 1990). Several studies demonstrated that constraints vary systematically by race and ethnicity, and the constraint variables that potentially limit activity may differ based on socio-demographics. For example, within a park and leisure context, Arnold and Shinew (1998) and Shinew, Floyd, and Parry (2004) found that Black park users reported fewer public park-related constraints compared to White users. In addition to perceived importance of constraints, the relative importance of interpersonal, intrapersonal, and structural constraints may also vary. Shores, Scott, and Floyd (2007) and Mowen, Payne, and Scott (2005) found that African American and Latino respondents rated a majority of their measured constraint variables significantly more important than non-Hispanic White respondents. Variations clearly exist among racial and ethnic minority groups with respect to barriers to leisure opportunities. However, one of the most critical leisure options among any group of people, especially Latinos who are at an increased risk for health problems, is the choice to (not) engage in physical activity, in particular leisure time physical activity (LTPA).

Constraints to Physical Activity among Latinos

Constraints to leisure and physical activity that have been reported by Latinos are varied, but common themes have related to psychological constraints and environmental access.

Psychological constraints to physical activity often associated with Latinos have included lack of interest, lack of self-discipline, dislike of exercise, and lack of self-motivation (Bautista, Reininger, Gay, Barroso, & McCormick, 2011; Eyler et al., 1998). Within the Latino population, Latinas' internalized and accepted cultural values may also play a role in their physical activity patterns. Compared to Anglo-American middle aged women, Mexican American women's entrenched family values have required them to put their family's needs ahead of their own personal needs, like physical health (Berg, Cromwell, & Arnett, 2002). Minority women, including Latinas, have reported that they receive most of their physical activity from caregiving duties and household activity, reflecting traditional gendered roles in their culture (Eyler et al.; Ransdell & Wells, 1998; Tortolero, Masse, Fulton, & Torres, 1999). Furthermore, this caregiving role has been reported as one of the top barriers to physical activity among Latinas (King et al., 2000; Parra-Medina & Hilfinger Messias, 2011). Similar socio-cultural constraints were reported by Cronan, Shinew, Schneider, Stanis, and Chavez (2008) who found that both Latinas and Latinos reported that they would like to engage in more physical activity at parks, but family obligations and the resulting lack of time prevented them from doing so. As a result, increasing social support among Latinos and other minorities may help encourage and promote more physical activity (Evenson, Sarmiento, Tawney, Macon, & Ammerman, 2003; Eyler et al., 1999; Eyler et al., 2002; Parra-Medina & Hilfinger Messias).

Public parks and recreation organizations may be a promising and logical environment to promote LTPA for many Latinos. Due to their role in physical health promotion, parks and recreation services have been recognized as part of the healthcare system of the United States (Godbey & Mowen, 2010). Parks are usually accessible to most community residents and offer low-cost services and programming that can be highlighted in physical activity interventions. However, availability and the amount of perceived access to parks and recreation resources that promote physical activity may differ depending on the socioeconomic status of a neighborhood (Cohen et al., 2007). As a result, environmental variables have also been significantly correlated with the low LTPA pursuits among Latinos.

Environmental constraints to LTPA among Latinos have been extensively reported in the literature. Previous research found common environmental constraints to increased physical activity included safety and access (Casper & Harrolle, in press; Eyler et al., 1998; López, Bryant, & McDermott, 2008). In a qualitative study investigating physical activity patterns among minority women, safety and fear was a common thread that deterred Latinas from participating in physical activity (Eyler et al.). Interviews with Latina immigrants in NC suggested that safe places to walk would be a good addition to any interventions aimed to improve physical environmental constraints (Evenson et al., 2003). However, as Cronan et al. (2007) pointed out, this safety/fear constraint has consistently been reported more by Latinas compared to Latinos.

Access not only to safe places but also to certain park and recreation amenities might also increase physical activity among Latinos. In general, access to indoor or outdoor places to participate in physical activity has been strongly associated with any form of activity, but certain built structures like sidewalks might encourage more LTPA (Evenson et al., 2003). Other barriers within parks that limited physical activity included insufficient lighting, surrounding vehicular traffic, and stray animals (Parra-Medina & Hilfinger Messias, 2011). In addition to access to safe places (e.g., parks), access and availability of certain park amenities (e.g., field, playground, and picnic areas) and programs can influence who uses the park and how much physical activity is gained from park use (Cohen et al., 2007). More specifically, Perry, Saelens, and Thompson (2011) found that among Latino youth, quality fields and courts that welcomed team sports were strong predictors of physical activity. With respect to programming, Parra-Medina and Hilfinger Messias reported that minimal availability of and therefore limited access to culturally and linguistically appropriate programs also constrained some Latinos. For example, they suggested that aerobic classes conducted in Spanish would be an appropriate program option for Latinos. The availability of perceived affordable options for physical activity also constrains Latinos. Latinas, who associated physical activity with commercial gyms and fitness centers, reported that financial constraints and cost were barriers to physical activity (Eyler et al., 1998). Even though research on constraints among Latinos is building, more in depth investigations are needed.

Acculturation and Constraints to Leisure-time Physical Activity

To further understand constraints to leisure-time physical activity among Latinos, we have drawn on assimilation theory, particularly acculturation. Acculturation has been defined as "a complex, multidimensional process of learning that occurs when individuals and groups come into continuous contact with different societies" (Stephenson, 2000, p. 77). As an individual of any particular ethnic group maintains constant contact with the dominant society, potential additional behavioral patterns and attitudes may be formed similar to the dominant society. This process of identification and behavioral change could take days, weeks, months, or years (Berry, 2001). Berry suggested that an individual's exposure to dominant culture characteristics (i.e., language and food) may influence behaviors (e.g., recreation) and adaptation of the dominant cultural norms (e.g., inactivity). Use of and proficiency in English is a specific way that immigrants become more acculturated.

Variation in intensity and type of leisure constraints would be expected to be associated with an individual's level of acculturation (Kim, Scott, & Oh, 2005; Scott et al., 2006; Stodolska, 1998). Several studies provided evidence that language proficiency influences ethnic minority group members' ability to interact socially with the majority population, choices for leisure activities, and discrimination experiences (Floyd & Gramann, 1995; Rublee & Shaw, 1991; Stodolska & Jackson, 1998; Yu & Berryman, 1996). Other aspects of acculturation, such as food preferences and religious practices may hinder development of particular leisure preferences and forms of participation (Stodolska).

When previous research examined the relationship between LTPA and acculturation for immigrants, conflicting results were found. For Latinos living in Illinois, no relationship was found between acculturation and recreational physical activity (Marquez & McAuley, 2006). However, data from a national health survey found that Latinos who were more acculturated were more engaged in LTPA (Berrigan, Dodd, Troiano, Reeve, & Ballard-Barbash, 2006). Hosper, Klazinga, and Stronks (2007) found additional conflicting results with immigrants living in Western countries, such as physical activity during leisure time increased as acculturation increased. However, this relationship was only found among individuals without children, living in attractive neighborhoods, and having no occupational physical activity.

Previous research has also found conflicting results regarding the effects of acculturation on leisure constraints depending on the specific immigrants being examined. Level of acculturation for Canadian immigrants was found to have a strong negative effect with specific immigrant-related leisure constraints (e.g., not speaking English well; Stodolska, 1998). Yet, for Korean immigrants, language use was not significantly related to leisure constraints. However, an acculturation factor explaining cultural heritage was positively related to fear of making a mistake and fear of discrimination (Scott et al., 2006). Whereas, Chinese immigrants who were more acculturated were more likely to have lower access, interpersonal, and sociocultural constraints (Tsai, 2000). These mixed results suggested specific immigrant groups (i.e., Latinos) need to be examined in regards to acculturation and leisure constraints.

In this study, we identified patterns of perceived constraints to LTPA within a sample of Latinos and examined if patterns of constraints vary by level of acculturation. Specifically, we used cluster analysis to identify subgroups within a Latino community with similar constraints to LTPA. In addition, we grouped respondents according to their level of acculturation.

Methods

Sample

Data were obtained through a survey of Latino residents living in Wake County, NC. In 2011, Wake County, NC had the highest rate of growth of Latinos among NC counties (U.S. Census, 2012). The survey was administered with the assistance of a nonprofit organization serving Latino communities in the region. Twenty promotores, who were Latino community health leaders, were recruited to collect data from community residents within Wake County, NC. As promotores are bilingual, familiar with health research, and culturally competent, they provide a unique and helpful way to collect data within local Latino communities (Anders, Balcazar, & Paez, 2006). Each promotora represented one community and was responsible for distributing and collecting 25 questionnaires within her/his representative community. The promotores were asked to distribute questionnaires to one individual per self-selected household and to split distribution between genders (men and women). Promotores returned questionnaires to the researchers at a monthly meeting where the returned questionnaires were examined to ensure

they followed the study protocol. The promotores received a \$150 incentive for their help after data collection was completed. A total of 457 completed questionnaires were returned (response rate of 91%). A majority of the participants were female (60%), first generation immigrants (80%), married (61%), primarily from Mexico (52%) and had at least a high school education (74%). Participants' ages ranged from 18 to 69 (M = 35 years old) and tended to be young, with 57.9% reporting an age between 18 and 35. Only 5% were age 55 or older. The majority of the sample reported an annual income of less than \$40K. Upon reviewing the 2010 U.S. Census data, our sample was found to closely match the demographic percentages of Latinos living in NC. Characteristics of the study sample are shown in Table 1.

Table 1. Demographic and Socioeconomic Characteristics of Study Respondents

	Frequency	Percent	n
Gender			
Men	179	40.2	445
Women	266	59.8	
Age			
18-35	260	57.9	449
36-55	165	36.7	
55+ 24	5.3		
Nativity			
Born in U.S.	357	79.9	447
Not U.S. born	90	20.1	
Acculturation			
Low	207	48.5	427
High	220	51.5	
Income			
<\$20K	158	37.9	417
\$20-39K	161	38.6	
\$40K+	98	23.5	

Measures

Constraints to LTPA were measured by seven constructs (3 items each) representing the three theoretical constraint dimensions (intrapersonal, interpersonal, and structural; Jackson, 2005): time (e.g., I don't have enough time), facility issues/ cleanliness, knowledge related to physical activity opportunities (e.g., I do not have information on where to go), psychological (e.g., I do not feel confident enough-, I am not fit enough), social support/partners (e.g., I do not have anyone to go with), accessibility (e.g., there are no opportunities near my home), and safety (e.g., I feel safe being physically active in my neighborhood-, reverse coded). Participants were asked how much each constraint prevented them from being more physically active on a 5-point Likert-type scale from 1 (strongly disagree) to 5 (strongly agree). Instrument validity was demonstrated previously through a confirmatory factor analysis (Casper & Harrolle, in press). A nine-item

English proficiency scale (e.g., how much do you speak English at home; how much do you speak English with friends; how fluently do you write English) was used to measure language and level of acculturation (Zea et al., 2003). Each item was measured on a 5-point Likert-type scale ranging from 1 (not at all) to 5 (very much). Subsequently, each participant was placed into low and high acculturation categories: low level of acculturation responded with a mean < 3.0 (n = 207; 48.5%) and high level of acculturation with a mean > 3.0 (n = 220; 48.5%).

Several sociodemographic variables were also measured. Nativity was a dichotomous measure indicating whether respondents were born in the U.S. or elsewhere. Age categories (young adult [18-35], middle aged adult [36-55], and older adult [55+]) were created based on classifications used in research to differentiate adult developmental consumer-related categories (Russell, Verrill, & Lane, 1988) and United States Census classifications of lifecycles. Based on the distribution of data within annual household income, income was measured using three categories (below \$20K, \$20-39K, and \$40K+).

Data Analysis

Analysis occurred in three phases. First, descriptive statistics were calculated for all study variables. In the second phase, cluster analysis was used (K-means procedure) to identify subgroups of respondents based on constructs derived from responses to the 20 constraints items. We used one-way analysis of variance with Tukey's means comparison to identify significant differences among the clusters. Using cluster analysis to study patterns in constraints follows direct recommendations of previous researchers (Jackson, 1993; Jun et al., 2009; Scott & Mowen, 2010). In particular, Jackson noted that cluster analysis offers theoretical and empirical advantages. First, Jackson observed that this approach recognizes that people experience a combination of constraints and constraint types. Second, the extent of inter-correlations between items (within factors) makes it difficult to examine effects of individual constraints when desired. Finally, the utility of results from these analyses for alleviating constraints could be of questionable value. An analytic approach that recognizes that people encounter and react to a combination of constraints could be of more practical value in helping leisure service organizations. Jackson recommended cluster analysis as an alternative analytic strategy "for identifying regularities that does [sic] allow for the recognition and investigation of combinations of different types of constraints" (p. 130). Cluster analysis aggregates individuals into homogenous subgroups so that individuals are located in the same cluster whereas factor analysis emphasizes identifying homogenous sets of items with common variance. The third phase included chi-square analysis to examine associations among constraints clusters, levels of acculturation, and sociodemographic characteristics.

Results

Constraint Patterns

Of the seven constraint types examined, accessibility (e.g., quality of parks not good enough, no opportunities near my home, don't have transportation; M = 2.85, SD = 1.00) and partners (e.g., friends don't like to play sports, difficult to find others; M = 2.85, SD = .99) were the highest rated type of constraints overall. These were followed by knowledge (M = 2.84, SD = 1.08), time (M = 2.77, SD = .98), facility constraints (M = 2.66, SD = .98), psychological (M = 2.53, SD = .98), and safety (M = 1.92, SD = .90).

Table 2 summarizes the results of cluster analysis and comparisons of constraint means by cluster membership. Nearly one-third of respondents (n = 148, 32.4%) were described as Access and Partner Constrained. This group exhibited highest mean scores for access and partner-based constructs. The second largest cluster was the Safety and Access Constrained (n = 118, 25.8%) group. This group had the highest mean scores on safety and access related constructs. A third group, Least Constrained (n = 103, 22.5%), had relatively low scores on all constraint constructs. A fourth group was designated as Highly Constrained (n = 88, 19.3%) given the relatively high scores on all constraints constructs except for safety. Means comparisons (Tukey's HSD) indicated that overall the clusters reflected distinct constraint patterns. On four constructs (psychological, facility, knowledge, and access), significant separation was observed for all clusters. For time and partners constraints, clusters Access and Partner Constrained and Safety and Access Constrained were similar. All clusters, except for Safety and Access Constrained, were distinct by having lower intensity responses for safety constraints.

Table 2. Results of Cluster Analysis and Mean Comparisons of Constraints by Cluster Membership

	Cluster 1 <i>Least Constrained</i> (n = 103, 22.5%)	Cluster 2 <i>Highly Constrained</i> (n= 88, 19.3%)	Cluster 3 <i>Access and Partner Constrained</i> (n = 148, 32.4%)	Cluster 4 <i>Safety and Access Constrained</i> (n = 118, 25.8%)	F-value
Safety	1.54 ^a	1.66 ^a	1.53 ^b	2.95 ^b	126.36***
Psychological	1.82 ^a	3.62 ^b	2.19 ^c	2.78 ^d	105.76***
Time	2.27 ^a	3.48 ^b	2.61 ^c	2.87 ^c	31.39***
Facility	1.84 ^a	3.50 ^b	2.54 ^c	2.91 ^d	70.39***
Knowledge	1.68 ^a	3.89 ^b	2.77 ^c	3.24 ^d	139.64***
Access	1.68 ^a	3.84 ^b	2.77 ^c	3.23 ^d	177.33***
Partners	1.78 ^a	3.64 ^b	3.08 ^c	2.90 ^c	102.51***

*** $p < .001$; Means with the same superscripts are not significantly different (Tukey HSD).

Comparisons of the sample's sociodemographic characteristics across the four clusters revealed significant differences (see Table 3) for nativity ($X^2 = 14.41$, $df = 3$, $p < .01$) and income ($X^2 = 22.9$, $df = 9$, $p < .01$). A higher percentage of respondents in the Access and Partner Constrained and the Safety and Access Constrained clusters reported being born outside of the U.S. A higher

percentage of respondents in the Safety and Access Constrained cluster reported income below \$20K, while a higher percentage of respondents in the Access and Partner Constrained cluster reported income in the S20-59K range. There were no significant differences ($p < .05$), however, by gender and age.

Table 3. Demographic and Socioeconomic Characteristics of Constraint Clusters

	Cluster 1 <i>Least Constrained</i>	Cluster 2 <i>Heavily Constrained</i>	Cluster 3 <i>Access and Partner Constrained</i>	Cluster 4 <i>Safety and Access Constrained</i>	Chi-Square df P-value
Gender					
Men	39 (38.2%)	28 (33.7%)	67 (46.2%)	45 (39.1%)	$\chi^2 = 3.84$ df=3 p=NS
Women	63 (61.8%)	55 (66.3%)	78 (53.8%)	70 (60.9%)	
Age					
18-35	48 (48.5%)	50 (58.8%)	82 (55.8%)	80 (67.8%)	$\chi^2 = 10.96$ df=6 p= NS
36-55	47 (47.5%)	31 (36.5%)	56 (38.1%)	31 (26.3%)	
55+	4 (4.0%)	4 (4.7%)	9 (6.1%)	7 (5.9%)	
Nativity					
Born in US	88 (86.3%)	75 (87.2%)	115 (79.9%)	79 (68.7%)	$\chi^2 = 14.41$ df=3 p < .01
Not US born	14 (13.7%)	11 (12.8%)	29 (20.1%)	36 (31.3%)	
Acculturation					
Low	40 (40.4%)	52 (61.9%)	67 (48.2%)	48 (45.7%)	$\chi^2 = 8.97$ df=3 p < .01
High	59 (59.6%)	32 (38.1%)	72 (51.8%)	57 (54.3%)	
Income					
<\$20K	26 (28.3%)	36 (43.9%)	48 (34.8%)	48 (45.7%)	$\chi^2 = 22.9$ df=9 p < .01
\$20-39K	34 (37.0%)	35 (42.7%)	62 (44.9%)	30 (28.6%)	
\$40K+	34 (34.7%)	12 (13.4%)	41 (20.3%)	40 (25.7%)	

When examining the relationship between constraint patterns and level of acculturation, a significant association was found ($\chi^2 = 8.97$, df= 3, $p < .01$). A greater percentage of respondents in the Highly Constrained cluster were in the low acculturation category. Conversely, the lowest percentage rates of respondents within the high acculturation group were members of the Least Constrained cluster.

Discussion and Conclusions

This study sought to examine patterns of constraints to LTPA among Latinos and to compare their constraint patterns by level of acculturation. Previous research indicated that Latinos are less likely than other population subgroups to achieve recommended levels of LTPA (Ahmed et al., 2005), which places them at greater risk for a range of chronic health conditions associated with inactivity and sedentary lifestyles. Our focus on constraints to leisure-time physical activity was guided by the potential of using previously established constraint typologies to inform physical activity interventions designed for Latino populations. Simultaneously, our research examined cultural adjustment difficulties embodied as acculturation, which are associated with constraint patterns. Past research has suggested that variation in intensity and type of leisure constraints is associated with an individual's level of acculturation (Kim, Scott, & Oh, 2005; Scott et al., 2006; Stodolska, 1998). In particular, lack of English proficiency is one aspect of acculturation found to be related to leisure constraints (Quniu, 2000; Rublee & Shaw, 1991; Stodolska; Yu & Berryman, 1996).

In terms of constraint patterns, a key finding was that safety stood out as the lowest type of constraint among Latinos in this study, followed by time and psychological constraints. These findings are contradictory to the qualitative data reported by Eyer et al. (1998). In their study, safety and fear were deterrents to physical activity participation among Latinas. Evenson et al. (2003) found that Latina immigrants in NC felt that safe places to walk would be a good addition to any interventions aimed to improve the physical environmental constraints. Perhaps the NC Latino residents in our study are aware of safe places to engage in physical activity, thus safety may not be an overall issue for the majority of this sample. However, park and recreation agencies could benefit from knowing that safety may be a constraint among its constituents as evident in one of our clusters (i.e., Safety and Access cluster). If safety is a potential issue, appropriate allocation of resources (e.g., better security) could be used to reduce this type of constraint.

In addition, four distinct subgroups were derived from a cluster analysis of the LTPA constraints constructs. The distinct subgroups in the sample were the Least Constrained, Highly Constrained, Access and Partner Constrained, and Safety and Access Constrained clusters. Socioeconomic and demographic characteristics of the clusters differed in several ways. Of particular importance is the association between constraint patterns and level of acculturation. Similar to other studies (e.g., Juniu, 2000; Rublee & Shaw, 1991; Stodolska, 1998), types of constraints varied by level of acculturation. Within the Least Constraint cluster, the majority of respondents were highly acculturated. Therefore, perceptions of constraints were low for those who use and know English. Within the low acculturation group, respondents were more likely to give the highest ratings (i.e., agree and strongly agree) to all constraint types. Because acculturation was operationalized as English language use and proficiency, our findings indicate that language can be a barrier to LTPA. In addition, this finding does not support findings reported by Scott et al.'s (2006) study of Koreans, in which no associations were found between

language use and leisure constraints. Clear differences exist between these two studies (criterion variables, populations, etc.). At the same time, the comparison accentuates a key finding of our study. When considering LTPA (as opposed to participation in a favorite activity for example), lack of English proficiency seems to matter a great deal for a significant portion of our sample, as it did in Parra-Medina and Hilfinger Messias' (2011) study of Latinos. Because LTPA is an activity driven by choice, Latinos with low acculturation (i.e., low English proficiency) could choose to seek programming settings more in line with their ethnic culture (i.e., where Spanish is used or culturally appropriate activities are offered [i.e., soccer]). A lack of inclusive LTPA programming specific to Latinos may contribute to their exclusion from the dominant American culture. Hence, more research is needed to understand how and why acculturation influences LTPA and associated constraints. Measuring additional dimensions of acculturation beyond language proficiency (i.e., cultural norms) would provide insights into the relationship between acculturation and LTPA constraints.

Even though previous researchers (Eyler et al., 1998; López, Bryant, & McDermott, 2008) found safety was a deterrent to park and recreation use, overall our findings showed that safety was not an important constraint except for the Safety and Access group. This group had the highest overall scores for safety and significantly higher safety scores than all other groups, thus safety was seen as a constraint that must be overcome in order to engage in LTPA. Conversely, safety was low within the Highly Constrained cluster. Latinos in our sample who were highly constrained would need to navigate through a myriad of barriers (e.g., partners, knowledge, access, safety) to engage in LTPA. This group may be least likely to even consider LTPA as an option or priority during their free time. For example, if a Latino resident does not know about walking paths in his local park or neighborhood or does not have a partner, they may not be thinking about safety related to those places. These findings suggest that a hierarchy might exist for Latinos who perceive many constraints to LTPA; however, more research is needed to understand how Latinos negotiate constraints to LTPA.

This study employed cluster analysis thus offering a conceptual perspective on how constraints are experienced, as well as practical insights on how park and recreation agencies might better serve Latino constituents. Cluster analysis allowed us to examine how Latinos in Wake County, NC experience a combination of constraints to physical activity. The resulting four distinct subgroups highlight various segments within the Latino population that are hindered by similar constraints. As a result, we were able to showcase how park and recreation programs may be a logical resource to help counteract the health risks facing the growing Latino population. Park and recreation agencies that serve this area of NC can use these subgroups to evaluate physical activity program components that could be modified to alleviate constraints of each group. Therefore, parks and recreation agencies can allocate resources (e.g., time, money, and effort) to alleviate constraints therefore potentially increasing participation and physical activity levels among Latinos.

Implications

From a practitioner perspective, a segmentation approach facilitated by cluster analysis (e.g., Jun et al., 2009; Scott & Mowen, 2010) can facilitate tailored promotions and marketing strategies that meet the needs of Latino populations. The Latinos in the Highly Constrained cluster reported the lowest acculturation, which was measured through understanding and using English. This group exhibited the highest rated constraints in all categories. Similar to programs currently offered in Wake County, recreation and park agencies could provide Latinos programs that address issues related to learning English and incorporating physical activity. For example, parks and recreation programs could develop programming that incorporates English as a Second Language (ESL) and recreational activities, such as walking and soccer. These types of programs would not only increase physical activity among Latinos, but they would also contribute to Latinos' overall quality of life by enhancing their English skills.

In order to help individuals negotiate safety related constraints for the Safety and Access cluster, park and recreation agencies can highlight safety efforts such as working with local police departments to increase patrols in problem areas and encouraging participants to avoid unsafe conditions. In situations where park facilities are generally safe, agencies should use appropriate methods (e.g., in Spanish and in appropriate locations) to communicate the precautions taken to ensure safe recreation experiences. Respondents constrained by safety and access (i.e., Safety and Access Constrained cluster) also had the lowest income levels among all of the clusters. In addition to the safety tactics previously mentioned, respondents in this cluster would benefit from promotions that highlight low-cost and low-skill programming available from park and recreation agencies such as walking programs. Finally, respondents who were constrained by access and available partners would not only benefit from programs that are accessible, but also from group classes that provide social support for physical activity.

Several limitations should be acknowledged. Our findings are based on predetermined constraint items which could have obscured constraints related to minority status or cultural background (Allison, 1988; Stodolska & Shinew, 2010). This study was also limited to one county in NC, thus, the results do not generalize to all Latino communities in the U.S. However, based on the U.S. Census 2010 data, the sample was similar to the characteristics of Latinos living in the state, making it more generalizable to Latinos living in NC. Additionally, the participants were not asked open ended questions about the recreational activities important to them because the instrument focused on programming currently offered in Wake County. Future research should consider qualitative approaches, such as interviews or focus groups designed to gather information on recreational opportunities not currently offered in the area. Lastly, study respondents were not randomly selected and the use of the promotores may have introduced selection bias.

Findings from the study contribute to the literature in two respects. First, they provide new information on how Latinos experience constraints to LTPA. In one respect, our data show that constraint patterns among Latinos differ from the general population (i.e., safety being most important). However, when considering that our focus was participation in physical activity,

they align with findings of previous physical activity studies (e.g., Eyster et al., 1998). Second, focusing on subgroups and their characteristics can inform leisure service providers on how to become more strategic in allocating efforts to alleviate constraints among Latino populations. Although many Latinos share a common culture (e.g., language), identifying differences in acculturation and constraints patterns can enable researchers and practitioners to consider how they might tailor physical activity programs and interventions for Latino audiences. Future research should examine additional assimilation processes such as structural assimilation to capture potential effects of inter-ethnic social interactions (Floyd, Gramann, & Saenz, 1993; Stodolska, 1998) and behavioral-receptional assimilation or perceived discrimination (Floyd & Gramann, 1995; Williams & Ortega, 1990) on constraints to physical activity in leisure. Subsequent studies should also consider criterion variables related to specific environmental and program settings (e.g., constraints related to use of park for physical activity, fitness facilities, etc.). Where resources permit, longitudinal studies are also encouraged.

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