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Latino Civic Group Participation, Social Networks, and Physical Activity

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Abstract

Objectives: We examined whether social networks and resource awareness for physical activity may mediate the relationship between civic group participation and physical activity.

Methods: This is a cross-sectional study of a randomly selected sample of 335 Latinos (mean age 42.1 ± 16.4 years) participating in the San Diego Prevention Research Center's 2009 Household Community Survey. Serial multiple mediation analysis tested the hypothesis that civic group participation is associated with meeting physical activity recommendations through an indirect mechanism of larger social networks followed by greater knowledge of physical activity community resources.

Results: The indirect effects of level of civic group participation as well as religious, health, neighborhood, or arts group participation on meeting national physical activity recommendations were significant in models testing pathways through social network size and physical activity resource awareness. The direct effect was only significant for health group indicating that participating in a health group predicted physical activity independent of social network size and awareness of physical activity resources.

Conclusion: Belonging to civic groups may promote physical activity engagement through social network diffusion of information on community physical activity resources which has implications for health.

Keywords

Latino; civic participation; social networks; physical activity

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Conflict of Interest Statement
The authors have no conflicts of interest to declare.

Human Subjects Statement
The study was approved by the San Diego State University and University of California at San Diego Institutional Review Boards.

Civic participation, such as voluntary participation in community groups, is associated with lower morbidity and mortality.[1-5] The mechanism by which civic group participation influences health has not been elucidated but physical activity has been proposed as a possible intermediate link.[6-11] Civic group participation increases the likelihood of engaging in walking, sports, and greater physical activity overall.[7,11] Civic groups include groups or organizations related to religion, health, neighborhood, business or unions, charities, culture or arts, and politics. It is unknown which specific civic group memberships most effectively promote physical activity; however, several studies have found that individuals involved in religious groups are more likely to be physically active than those with no such involvement.[12-15]

Civic Group Participation and Social Networks

Civic group participation is an indicator of social capital.[16] Social capital is described as resources available through social connections (social networks).[17] Participation in civic groups provides opportunities for development of social capital by facilitating social interactions that translate to social network expansion. Hence, individuals who belong to civic groups have larger social networks than those that do not.[18] Studies have also found that individuals with larger social networks are more physically active.[19] Civic group participation may directly promote physical activity as a result of belonging to a group such as a walking club or could indirectly promote physical activity through social networks.[9,20] Social networks may provide companionship when engaging in physical activity or access to information about physical activity resources in the community such as places to be active.

Social Networks as Information Channels

Civic groups may lead to improved health by enabling the sharing and diffusion of relevant information among members.[21] Civic group participation may expose individuals to health information through interpersonal communication via social networks. Individuals who participate in community or religious groups are more likely to recall health promoting messages and have greater health-related knowledge.[22,23] Multiple group participation could lead to greater network diversity which can increase the range of informational sources and access to resources for physical health.[18,20]

Latino Civic Group Participation and Physical Activity

Given that interdependent communities are more effective in disseminating information including health-related knowledge, we were interested in studying the relationship between civic group participation and physical activity in Latinos. Although civic group participation is lower in Latinos than non-Hispanic Whites, Latinos are more likely than non-Hispanic Whites to participate for the purposes of accomplishing goals as part of a group, meeting new people, and keeping up with information that matters to them.[6,24] Several studies have shown that social ties are important sources of health-relevant information in Latinos especially among immigrants.[25-30] Latinos living in neighborhoods with a high proportion of Latinos have larger social networks and better healthcare access which may be partly attributed to transmission of information within these communities.[31,32] As with other ethnic

minority groups, Latinos with larger social networks are more physically active; however, in general, Latinos have smaller social networks and are less likely to meet the national guidelines for physical activity compared to non-Hispanic Whites.[33-35] Hence, community ties may promote physical activity by facilitating social ties that provide relevant information for Latinos.

Present Study

The present study examined whether social networks and physical activity resource awareness mediated the relationship between civic group participation and meeting the national recommendation of at least 150 minutes per week of moderate-to-vigorous physical activity (MVPA). Guided by the socio-ecological framework, we examined upstream and downstream influences at the community, interpersonal, and individual levels.[36] The community level is represented by participation in civic groups, the interpersonal level of influence is reflected in social network size, and the individual level corresponds to awareness of physical activity resources in the community and engagement in physical activity. We propose a pathway whereby participation in a civic group (community level) influences the size of one's social network (interpersonal level) which, in turn, increases knowledge of physical activity resources, leading to greater physical activity (individual level). The following hypotheses were tested:

(1) Greater level of civic group participation will increase the likelihood of meeting the guidelines for MVPA indirectly through social networks and physical activity resource awareness.

(2) Specific types of civic groups will affect MVPA indirectly through social networks and physical activity resource awareness.

METHODS

Participants

Data were drawn from the San Diego Prevention Research Center's 2009 Household Community Survey, a cross-sectional study design comprised of adult Latinos randomly sampled from Southern San Diego County using multistage sampling methods.[33] Participants completed interviewer-administered measures in Spanish or English during home visits by trained bilingual/bicultural research assistants.

Measures

Demographics.—Self-reported information on sex, age, marital status, education, and employment were collected. Age was categorized in 3 groups: 18-35, 36-50, or >50 years old. Sex was coded as female (1) and male (0). Marital status was coded as married/living as married (1) or not (0). Education was coded as high school graduate (1) or not (0). Employment status was coded as employed (1) or not (0). Nativity status was coded as foreign-born (1) and US-born (0).

Acculturation.—Acculturation was assessed using the Bi-dimensional Acculturation Scale (BAS) for Hispanics/Latinos.[37] Acculturation categories were generated based on composite scores from each cultural (Hispanic and non-Hispanic) domain using established cutoff points to reflect the following 3 groups: Hispanic (maintained traditional practices including almost exclusive use of the Spanish language); bicultural (fairly equal use of Spanish and English); and non-Hispanic (more frequent use of English vs Spanish language). The Cronbach's alpha indicated the scale had high internal consistency (Hispanic domain α=0.90 and non-Hispanic domain α=0.96).

Civic group participation.—Participants were asked whether or not they were involved in a variety of community groups and organizations in the past 12 months. The list included groups related to religion (committees, club or study group), health (exercise or sports, nutrition, and support groups), neighborhood (parent groups, youth-orientated groups, neighborhood associations, or senior citizen groups), charities (social welfare), business (professional groups or unions), politics (public interest, political party, or civil rights), and arts (art, literary, or crafts). Participants indicated group participation with a yes or no response rather than the number of groups they participated in within each group category. Civic group participation level was determined by the number of group memberships and was divided into 4 categories for analysis: 0, 1, 2, and ≥3 groups. Participation in specific group types was dichotomized [yes (1) and no (0)].

Social network size.—Participants were asked to list up to 5 people upon whom they relied to talk with about personal issues or problems.[33] The sum number of network members listed was used as the indictor of social network size.

Physical activity resource awareness.—Awareness of resources in the community for physical activity was assessed by a 3-item scale.[38] We asked participants to what extent they agreed with the following statements: (1) In my community I hear a lot about ways to be physically active; (2) In my community there are plenty of places to support people being physically active; and (3) In my community I see many people being physically active. Response options ranged from 1=strongly disagree to 4=strongly agree. A composite score was created by summing the 3 items. The Cronbach's alpha indicated the measure had adequate internal consistency of α=0.71.

Physical activity.—The Global Physical Activity Questionnaire (GPAQ), a 16-item scale that measures physical activity in a typical week,[39] was used to measure meeting the recommendation for MVPA. Responses were dichotomized to < 150 (0) or ≥ 150 (1) minutes/week of MVPA to reflect national recommendations for physical activity.

Analysis

All statistical analyses were performed using PASW Statistics 21 (SPSS, Inc., Chicago, IL). Descriptive statistics were used to summarize demographic characteristics and civic group participation.

Serial multiple mediation was conducted to determine if the association between civic group participation and MVPA was mediated by social network size through physical activity

resource awareness (Figure 1a) using macros in PROCESS v2.13 for IBM SPSS.[40] A total of 335 participants had complete data for independent, dependent, and mediation variables and were included for analyses in this study. The independent variable (X) is level of civic group participation and the dependent variable (Y) is meeting or not meeting the 150 minutes per week of MVPA recommendation. Social network size is the first mediator (M1) and physical activity resource awareness is the second mediator (M2) in the model. By convention, *a* represents the association between X and M, and *b* represents the association between M and Y. The mediation model tests the total effect of X on Y (*c*), the direct effect of X on Y (*c*'), the total indirect effect of X on Y through all mediators, and specific indirect effects (*ab*) of each mediator independent of one another [total effect (*c*)=direct effect (*c*') + indirect effect (*ab*)]. Indirect path 1 (a_1b_1) represents the effect of X on Y through M1 (Figure 1b). Indirect path 2 ($a_1d_{21}b_2$) represents the effect of X on Y through M1 which in turn effects M2. Indirect path 3 (a_2b_2) represents the effect of X on Y through M2. We used bootstrapping to assess total and indirect effects using 10,000 bootstrapped samples. An indirect effect is considered significant if the 95% bias-corrected bootstrap confidence interval does not contain zero. A significant total effect of X on Y is not a prerequisite to testing for indirect effects; indirect effects can be significant in the absence of a significant total effect.[40] Based on known relationships with the independent and dependent variables, covariates sex, age, marital status, education, employment, and acculturation were included in the models.

RESULTS

Participant Characteristics

Participant characteristics of the study sample are presented in Table 1. The majority of participants were female (73%), under the age of 51 years (74%), and married (59%). Most reported less than a high school education (54%) and were unemployed (52%). Participants were predominately foreign-born (76%) and Spanish-speaking (51%). The average number of network members reported was 3.6 ± 1.29.

Civic Group Participation

Almost half of participants were involved in at least one civic group in the past year (Table 2). Individuals who belonged to a civic group participated on average in 1.52 ± 0.98 groups of various types. The most common group was religious group (59%), followed by health (28%) and neighborhood (19%) groups. The least common groups (< 10%) were business, charity, arts, and political groups. More females (23%) than males (8%) participated in neighborhood groups.

Serial Multiple Mediation

The results of the serial multiple mediation analyses are presented in Table 3. Only indirect path 2 was significant in models testing level of civic group participation (*ab*=0.009, SE=0.006, 95% CI=0.0010-0.0307), and participation in religious (*ab*=0.011, SE=0.010, 95% CI=0.0001-0.0469), health (*ab*=0.013, SE=0.011, 95% CI=0.0004-0.0522), neighborhood (*ab*=0.022, SE=0.017, 95% CI=0.0013-0.0780), and arts (*ab*=0.027, SE=0.019, 95% CI=0.0026-0.0847) groups. Civic group participation was associated with

social network size (a_1) but not physical activity resource awareness (a_2). Social network size was associated with physical activity resource awareness (d_{21}) but not MVPA (b_1). Physical activity resource awareness was associated with MVPA (b_2). Taken together, these results show that civic group participation predicted having a larger social network, which was associated with greater awareness of physical activity resources in the community, which in turn, predicted meeting the MVPA recommendation of 150 minutes per week. The direct effect was only significant for health group (c'=0.871, SE=0.363, p = .016) indicating that belonging to a health group predicted MVPA while controlling for social network size and awareness of physical activity resources.

DISCUSSION

The present study contributes to our understanding of the relationship between civic group participation and physical activity. We investigated the role of social networks and awareness of community physical activity resources in mediating this relationship. To the best of our knowledge, this is one of the first studies to examine potential multi-level pathways to physical activity among Latino adults.

Approximately half of the sample participated in at least one civic group, with religious groups being most common, followed by health groups and neighborhood groups. This finding is consistent with national data showing that men and women are more likely to be active in a church, religious, or spiritual group than any other type of voluntary group in the US.[18,24] Whereas participation in health-related groups such as sports or recreation leagues is reportedly similar in non-Hispanic Whites and Latinos, involvement in neighborhood or community groups is less common in Latinos.[24] Latinos also have been found to be less active than non-Hispanic Whites in business, charity, arts, and political groups which, in the present study, were reported by less than 10% of individuals who belonged to a civic group.[24] The level of civic group participation was similar between males and females in the current study. Nationally, women are more likely than men to be active in religious, parent, seniors, and arts groups, but we detected this sex difference only for neighborhood groups which included parent and seniors groups.[24]

Individuals who participated in a civic group had larger social networks. Belonging to more groups was associated with having more members in one's social network. Civic groups provide opportunities for social interactions and facilitate relationship building. Participating in multiple groups can also increase exposure to people with diverse backgrounds and knowledge. In fact, individuals who belong to voluntary organizations have greater diversity in their social networks.[18] Network diversity is important to social capital. For example, individuals with network members with higher-prestige occupations and more education are more likely to seek health information and consult multiple sources.[41]

Individuals with larger social networks had greater awareness of physical activity resources in the community. Social interaction with a larger number of people may lead to more sources of information which has important implications for health because people with larger social networks search for health information more actively than those with smaller

networks.[41] Social networks contribute to social capital because interpersonal communication helps facilitate the flow of health promoting information.

Individuals with greater awareness of physical activity resources were more likely to engage in at least 150 minutes per week of MVPA. Knowledge of local opportunities and places to be active in the community can reduce significant barriers to being physically active. Whereas information alone is not generally sufficient for behavior change, resource awareness can be particularly valuable to Latinos who may face challenges to becoming physically active due to immigration status, limited English language proficiency, economic difficulties, and/or concerns for neighborhood safety.[27,42,43] Moreover, physical activity-related facilities or settings are less likely to be present in neighborhoods with a high proportion of Latinos compared to non-Hispanic Whites and knowledge of available physical activity resources may help reduce a prominent deterrent of physical activity in these communities.[44]

As hypothesized, civic group participation was associated with meeting the national physical activity recommendation, potentially by increasing social networks that provided greater awareness of physical activity resources in the community. The indirect effect was significant when testing the relationship between level of civic participation or specific groups (religious, health, neighborhood, and arts) and physical activity. The fact that the mediating effects of social networks and awareness of physical activity resources on their own were not significant supports the idea that social networks are prerequisite information channels for physical activity. Previous studies have shown that Latinos with lower levels of civic participation are less physically active.[6,45] Other studies also have shown that Latinos with larger social networks are more physically active.[33,46] However, this is one of the first studies to demonstrate the key role of social networks in information sharing as part of the mediating mechanism. Because network size and network diversity are linked, it is possible that network diversity also mediates the relationship of civic group participation and physical activity.[9]

Belonging to a health group was also associated with physical activity by a mechanism independent of social networks and awareness of physical activity resources. After controlling for social networks and awareness of resources for physical activity, the direct effect was only significant for health group indicating that health group participation remained associated with physical activity. Health groups may directly increase physical activity by providing opportunities to be more active as a result of participation itself such as joining a soccer team, walking club, or Zumba class at the YMCA. Hence, health groups are distinct in that members have a particular interest in health and well-being. It makes sense then that participation in these groups has direct and indirect effects on physical activity. Multiple pathways help reinforce physical activity engagement.

There are some study limitations that deserve mention. The cross-sectional design does not allow us to make causal conclusions about the examined relationships. We are also unable to establish the temporal order of the examined relationships. There is the possibility of reverse causation such that physically active individuals may be more likely to participate in civic groups. The mediation models tested were based on existing evidence but a longitudinal

study is necessary to verify the ordering of associations. Additionally, although capping the number of names participants could list in the name generator is consistent with the method used in observational studies, this approach could have led to underestimation of social network size. Further, our sample consisted of less than 30% males which may limit generalizability of results. Finally, physical activity was measured via self-report which is subject to misreporting; however, the GPAQ was previously validated using objective measurement.[47]

Several strengths of the current study are also worth noting. First, this study consists of a community sample of Latinos, a group disproportionately affected by physical inactivity and related comorbidities. Second, the study design allowed for a random sample that included a range of ages as well as males and females of different nativity or acculturation status. Third, we examined specific civic groups to identify which group types might better promote physical activity. Finally, this study is novel in that the analytical approach testing serial mediation allowed the examination of potential pathways to physical activity, which offers insight into how social networks, embedded in a larger community context, operate at the individual level to influence physical activity. Hence, our findings add to the literature on the importance of social networks to health behaviors.

Conclusion

Civic group participation reflects an individual's integration into a community, which has implications for health. This study found that civic group participation was associated with having larger social networks, which in turn, was related to greater awareness of physical activity resources in the community, which increased the likelihood of meeting physical activity recommendations. Although different in their purpose, participation in various civic groups produced benefits beyond the intended goals of the group suggesting that individuals that may not be focused on health can be reached. Thus, intervention efforts aimed at supporting various community groups to involve Latinos may be an effective strategy to increase physical activity.

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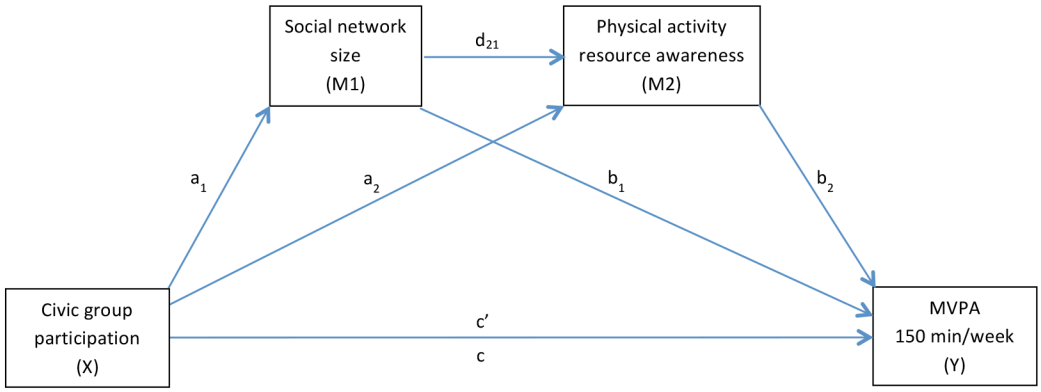
a.



b.

Indirect path 1: Civic group (X) $\xrightarrow{a_1}$ Network size (M1) $\xrightarrow{b_1}$ MVPA (Y)

Indirect path 2: Civic group (X) $\xrightarrow{a_1}$ Network size (M1) $\xrightarrow{d_{21}}$ Physical activity resource awareness (M2) $\xrightarrow{b_2}$ MVPA (Y)

Indirect path 3: Civic group (X) $\xrightarrow{a_2}$ Physical activity resource awareness (M2) $\xrightarrow{b_2}$ MVPA (Y)

Figure 1.
Serial Multiple Mediation Model

Table 1

Participant Demographic Characteristics (N = 335)

	N (%)
Sex	
Male	89 (26.6)
Female	246 (73.4)
Age (years)	
18-35	130 (38.8)
36-50	121 (36.1)
>50	84 (25.1)
Marital Status	
Not married	136 (40.6)
Married	199 (59.4)
Education	
Less than high school graduate	182 (54.3)
High school graduate or more	152 (45.7)
Employment	
Not employed	177 (52.8)
Employed	158 (47.2)
Nativity	
Foreign-born	256 (76.4)
US-born	79 (23.6)
Acculturationa[a]	
Hispanic	171 (51.0)
Bicultural	143 (42.7)
Non-Hispanic	21 (6.3)

Note.

[a] - Bi-dimensional Acculturation Scale

Table 2

Civic Group Participation

	All	Male	Female
Participation level (%)			
0	55.2	53.9	55.7
1	29.3	30.3	28.9
2	10.1	11.2	9.8
≥3	5.4	4.5	5.7
Group type (%)			
Religious	59.9	55.3	61.6
Health	28.4	31.9	27.0
Neighborhood[a]	19.5	8.5	23.8
Business	8.9	14.9	6.6
Charities	8.1	3.3	9.6
Arts	7.7	8.5	7.4
Political	6.5	10.6	4.9

Note.

[a] - $p < .05$

Table 3

Serial Multiple Mediation Modeling on the Effects of Civic Group Participation on Physical Activity

Mediators	Effect of civic group participation on mediator (a)[a]	Effect of mediator 1 on mediator 2 (d_{21})[a]	Effect of mediator on MVPA (b)[a]	Effect of civic group participation on MVPA without mediation (C)[a]	Effect of civic group participation on MVPA with mediation (C')[a]	Indirect effect (ab)[b]	95% Confidence Interval
Civic group participation level							
Indirect path 1	0.231 (0.080) 0.004	-	0.048 (0.102) 0.640			0.011 (0.027)	−0.0369-0.0725
Indirect path 2	0.231 (0.080) 0.004	0.144 (0.039) 0.0003	0.280 (0.140) 0.045	0.098 (0.141) 0.486	0.083 (0.142) 0.556	**0.009 (0.006)**	**0.0010-0.0307**
Indirect path 3	−0.001 (0.058) 0.977	-	0.280 (0.140) 0.045			−0.000 (0.018)	−0.0436-0.0358
Religious groups							
Indirect path 1	0.308 (0.157) 0.050	-	0.065 (0.102) 0.523			0.020 (0.039)	−0.0392-0.1324
Indirect path 2	0.308 (0.157) 0.050	0.140 (0.039) 0.0005	0.266 (0.140) 0.058	−0.225 (0.283) 0.426	−0.221 (0.287) 0.440	**0.011 (0.010)**	0.0001-0.0469
Indirect path 3	−0.124 (0.113) 0.274	-	0.266 (0.140) 0.058			−0.033 (0.040)	−0.1515-0.0157
Health groups							
Indirect path 1	0.403 (0.217) 0.064	-	0.029 (0.102) 0.775			0.011 (0.049)	−0.0734-0.1371
Indirect path 2	0.403 (0.217) 0.064	0.128 (0.001) 0.039	0.256 (0.141) 0.070	**0.915 (0.361) 0.011**	**0.871 (0.363) 0.016**	**0.013 (0.011)**	**0.0004-0.0522**
Indirect path 3	0.120 (0.156) 0.443	-	0.256 (0.141) 0.070			0.030 (0.046)	−0.0327-0.1626
Neighborhood groups							
Indirect path 1	0.663 (0.238) 0.005	-	0.038 (0.102) 0.706			0.025 (0.078)	−0.1151-0.2038
Indirect path 2	0.663 (0.238) 0.005	0.126 (0.040) 0.001	0.262 (0.140) 0.062	0.395 (0.407) 0.331	0.323 (0.414) 0.435	**0.022 (0.017)**	**0.0013-0.0780**
Indirect path 3	0.144 (0.173) 0.406	-	0.262 (0.140) 0.062			0.037 (0.057)	−0.0375-0.2073
Arts groups							

Mediators	Effect of civic group participation on mediator (a)[a]	Effect of mediator 1 on mediator 2 (d_{21})[a]	Effect of mediator on MVPA (b)[a]	Effect of civic group participation on MVPA without mediation (C)[a]	Effect of civic group participation on MVPA with mediation (C')[a]	Indirect effect (ab)[b]	95% Confidence Interval
Indirect path 1	0.712 (0.246) 0.004	-	0.029 (0.103) 0.772			0.021 (0.082)	−0.1266-0.2064
Indirect path 2	0.712 (0.246) 0.004	0.138 (0.039) 0.0005	0.277 (0.141) 0.049	0.627 (0.417) 0.132	0.559 (0.426) 0.189	**0.027 (0.019)**	**0.0026-0.0847**
Indirect path 3	0.135 (0.178) 0.450	-	0.277 (0.141) 0.049			0.037 (0.057)	−0.0400-0.2106

Note.

Regression coefficient for all paths based on models adjusting for sex, age, marital status, education, employment, and acculturation

[a] - Regression coefficient (standard error)

[b] - Regression coefficient (standard error)