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Predictors of Change in Sports Participation in Latino and non-Latino Children

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Abstract

Background—Few prospective studies have examined predictors of change in specific physical activity (PA) behaviours in different ethnic groups.

Purpose—To assess predictors of change in sports participation in Latino and non-Latino 5-8 year-old children in San Diego, California.

Methods—Average sports participation frequency (days/week) was assessed by validated parent-report at baseline (Nov 2006 to May 2008) and one year later in 541 children (45.0% male, 41.1% Latino; Mean±SD age: 6.6±0.7 yrs) taking part in an obesity prevention study (Project MOVE). Biological (sex, age, BMI z-score), socio-cultural (ethnicity, income, caregiver education), parental (PA rules, PA encouragement) and environmental factors (home PA equipment, PA location) were assessed at baseline. Associations between change in sports participation and potential predictors were studied using multi-level linear regression stratified by Latino ethnicity, adjusted for sex, baseline sport participation, study condition and recruitment area.

Results—Sports participation increased over one year (mean change: +0.5 days; $p<0.001$) and change was similar for boys and girls ($p=0.95$), but Latino children showed a greater increase ($p=0.03$). The number of locations used for PA ($p=0.024$) and the total frequency of PA location use ($p=0.018$) were positively associated with increased sports participation among Latinos. No predictors were identified for non-Latino children.

Conclusions—Only factors relating to PA location were identified as predictors of change in sports participation for Latino children. Interventions targeting specific PA behaviours such as sports participation may need to consider PA locations for Latino children and be tailored for specific ethnic groups.

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Authors' contributions Study design, study coordination and data collection for this study were conducted by JE, JS, NC, JM, LS and KC. The research question was defined by KC and EvS; KC performed data analyses and drafted the manuscript. All authors provided critical input on the data analyses and all versions of the manuscript, all authors approved the final version. None of the authors had any conflicts of interest.

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Introduction

Regular physical activity (PA) is important for child health(1-6). Only 42% of elementary-age US children appear to meet PA guidelines (7). Sport participation may contribute 23% of total moderate and vigorous PA (MVPA) (8) and up to 40% of activity energy expenditure in children (9). Children with more frequent sports participation have a lower BMI (10), and sports participation in childhood may reduce the risk of metabolic syndrome in adulthood (11). Sports and organized activity behaviours may remain stable throughout adolescence while other PA behaviours decline (12). It therefore appears important to promote sports participation and to first investigate prevalence and predictors.

Numerous cross-sectional studies have reported biological, social, cultural and environmental factors associated with PA (13-15), but few prospective studies describe predictors of change. A review of predictors of PA change showed no conclusive evidence of any factors related to change in young children (16) and no studies were identified examining change in sports participation in those under 10 years-old (16).

Sports participation may differ by ethnicity; data from a US national survey showed that 52.5% of Latino high school students engaged in sport, compared to 65.4% of White, and 55.2% of African-Americans (17). Some studies suggest that less acculturation is associated with higher levels of exercise, sports and other physical activities (18) whereas evidence also shows less sports participation in immigrant children with foreign born parents (19). Ethnic differences in sports participation may result from variation in promotion, access and support of sports facilities, but evidence of the association between Latino ethnicity and PA environment availability is conflicting (20, 21). Factors that relate to child's sport participation include parental PA (22), parental support (23), enjoyment and social support (24), but relatively little is known about whether these factors differ by ethnicity. There is some evidence of ethnic differences regarding parental encouragement which has been positively related to child's PA among white and African-American children, but not for Latinos (25).

Despite availability of PA interventions in children targeting specific ethnic groups, evidence regarding their effectiveness is limited (26). As the contribution of sports and organized activities to total PA may increase as children get older (12), interventions to increase childhood PA might be advised to establish healthy PA habits such as sports participation, which may sustain into adulthood.

The purpose of the present study was to assess predictors of change in sports participation in 5-8 year-old Latino and non-Latino children.

Methods

Study design and setting

Study participants included 541 children (5 to 8 years old) living in San Diego County (CA) who participated in MOVE/me Muevo, an obesity prevention study based in recreation centres. Recruitment took place from November 2006 to May 2008. Eligibility criteria included having a child aged 5-8 years, living within 1.75 miles from one of 30 participating recreation centres and being able to speak and read English or Spanish. A total of 541 parent-child dyads were measured at baseline; parents (or primary caregivers) provided written informed consent and children provided oral assent. Ethical approval was obtained from the San Diego State University Institutional Review Board.

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Parents completed a questionnaire, and child anthropometric measures were taken. Height (Shorr Measuring Height Board) and weight (SECA 880 and 876) were assessed using standard procedures by trained staff to the nearest 0.1 cm and 0.1 kg, respectively. Body mass index (BMI) z-scores were calculated using the CDC 2000 reference data (27). The questionnaire was self-administered at the measurement session. Parents reported demographic information for themselves and their child including: age, gender, Latino ethnicity, family monthly income (<$500-$2000, $2001-$3500, $3501-$5000 and ≥$5001), parent education (middle school or less through post-graduate).

Follow-up data collection took place approximately one year post-baseline. Parents completed a shorter version of the baseline questionnaire, administered in the same way as at baseline.

Sports participation

Sports participation was derived at baseline and follow up from two questions on the parent survey: 1) "Not counting school physical education (PE) classes, how many days per week does your child play or practice team sports?" and 2) "Not counting school PE classes, how many days per week does your child have PA classes or lessons that are not team sports (like martial arts, dance, tennis)?" Both questions had eight response options (0 to 7 days/week). The sports participation score was a mean of responses from both questions (mean days/week). A continuous change score was derived as follow-up minus baseline.

Validation of sports participation variable—Baseline PA was assessed in a subsample (n=178) using the Actigraph accelerometer (Model GT1M). Children wore the monitors according to standard procedures for 7 days (28) from the measurement session. Accelerometer data were prepared in the same manner as in a previous study (29). Time spent in MVPA and VPA were estimated using age-specific cut-points (30). Parent-reported sports participation was able to rank accelerometer-assessed VPA (Spearman's rho=0.16; p=0.03) and MVPA (Spearman's rho=0.16; p=0.04).

Potential predictors of change

Potential predictors of change in sports participation were parentally reported at baseline. Cronbach's alpha was computed to determine the internal consistency of item groups. The presence of eight rules regarding PA, such as "do not go places alone", were taken from a previously used survey with reported reliability (ICC=0.42 to 0.74) (31). Responses were "yes", "no" and "sometimes", the latter two categories were combined as if a rule is only 'sometimes' present, it is unlikely to be regularly enforced. Due to most parents reporting having all rules, responses were dichotomized (≤6 rules or ≥7 rules). Parental PA support was derived as a mean of three questions regarding encouragement, transport and doing PA with their child (α=0.75) with response categories as "never", "< once/week", "1-2 times/week", "3-4 times/week" and "5-7 times/week". A mean score for parental encouragement for less sedentary behaviour was derived from two questions; "to help children think of ways to be less inactive" and "encouraging less inactive time" with the same response categories as above (α=0.79). The number of types of PA equipment at home (range 0-8) was examined using an adapted scale, the original scale showed acceptable reliability (ICC=0.80) (32).

Child use of PA location questions were adapted from the 'Active Where?' survey (reliability ICC=0.60 to 0.89) (31). Respondents selected the frequency of their child's PA participation at 11 locations (including recreation centres, parks, trails and homes) during a typical week. Response categories were never, <once/week, 1-2 times/week, 3-4 times/week

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and 5-7 times/week. A composite variable was derived to assess the number of locations used ≥ once/week.

Statistical Analyses

Differences in baseline characteristics by gender and between children with and without follow-up sports participation data were tested using t-tests or chi-square tests as appropriate. Differences in baseline sports participation and change in sports participation by gender, ethnicity, study condition, income and caregiver education were assessed using multilevel linear regression analyses adjusting for recruitment area clustering. To account for variation in time to follow-up (mean±SD 511.4±73.1 days), time (days) between baseline and follow-up measurements was included as a covariate.

Associations between change in sports participation and potential predictors were investigated using multilevel linear regression. Analyses were stratified by ethnicity and adjusted for sex, study condition (intervention or control), follow-up time, baseline sport participation and recruitment area clustering. Study condition was adjusted for but intervention effects were not assessed.

Analysis was carried out using Stata 10.0 (Statacorp, College Station, TX).

Results

Those without complete sports participation data at baseline and follow-up were excluded (N=58); there were no significant differences between those with and without complete data for gender (p=0.88), caregiver education (p=0.19), age (p=0.18), BMI z-score (p=0.44), self-reported parent PA level (p=0.87) or study condition (p=0.08). Those without complete sports participation data were more likely to be Latino (p=0.03).

Baseline sports participation by ethnicity is shown in Table 1. At baseline, boys and older children participated in sports more frequently than girls (p=0.01) and younger children (p=0.03), respectively. There were no significant differences in baseline sports participation by study condition (p=0.13), ethnicity (p=0.59), income (p=0.59), child BMI z-score (p=0.55) or caregiver education (p=0.86).

Change in sports participation is shown in Table 2. Frequency of sports participation increased over one year for all children and for boys and girls separately. Latino children showed a greater increase in frequency of sports participation than non-Latino children.

Potential predictors of sports participation are presented in Table 3. Parents of non-Latino children reported providing more encouragement for PA and more home PA equipment. Parents of Latino children reported providing more encouragement for less sedentary behaviour. Non-Latino children used more PA locations and reported more frequent use of commercial facilities and beaches for PA.

A greater increase in frequency of sports participation was associated with use of more PA locations (0.17 locations [95%CI: 0.02, 0.31] p=0.024) and greater total frequency of location use (0.05 visits/week [95%CI: 0.009, 0.09] p=0.018) among Latino children. No predictors of change in sports participation were identified among non-Latino children.

Discussion

Frequency of sports participation increased over one year in 5 to 8 year-old children, independent of study condition. This observed increase was greater in Latinos, with an

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average difference in increase of 0.5 days/week. Only factors relating to PA location were identified for Latinos; no predictors were identified for non-Latinos.

Latino children increased sports participation more than non-Latinos, despite similar baseline levels. There is some evidence that Latino families often have a greater interest in organized and/or team sports than other ethnicities (33), but there is little comparative data regarding change in sports participation. A systematic review of predictors of PA change found no studies examining change in sports participation in those under 10 years-old (16). This lack of comparative data highlights the need for future research examining predictors of PA, especially in children of diverse ethnicities. Despite no difference in change in sports participation by study condition, the intervention may have increased awareness of free programs at public recreation centres, particularly among lower income Latinos which could explain the greater increase in sports participation among this group.

Only factors concerning PA location were identified as predictors of sports participation, and only for Latino children. This may suggest that use, and possibly availability and range of suitable PA locations may be important for influencing child PA among Latinos. Latino children who used more locations for PA increased sports participation more. Children who already use more locations may have more opportunities to play sports as they age. Parents of Latino children reported lower PA equipment availability at home and while this may predominantly be a predictor of unorganized play, it may still be relevant for sports participation around (or in) the home. It is possible that important predictors specific to the Latino population were not assessed; this may be partly because the factors examined were mainly based on previous literature focusing on predominantly White children.

The lack of predictors identified among non-Latino children suggests that other factors may be important regarding sports participation in this group. However, this study did include factors previously found to relate to child sport participation such as parental PA (22), and parental support (23). It is possible that although related cross-sectionally, these factors are not related to change. This null finding could also be due to differences in the questions used, the population or a lack of power. Present analyses focused on sports participation which is only one aspect of overall PA; other PA behaviours may have different associations with the predictors investigated. For example, a specific location could be important for overall PA even if sports are not done there. Very little, if any, previous research is available with which to directly compare these results. Most previous studies examining sports participation have been cross-sectional, and previous longitudinal studies did not examine a wide range of predictors (12, 34), did not compare ethnic groups, and were done in older children.

Strengths and limitations

This study examined a wide variety of predictors of change in sports participation in an ethnically diverse sample of young children. A noticeable limitation was the use of parent-reported sports participation data. However the reported variable was shown to significantly relate to accelerometer-measured VPA and MVPA in a subsample. Sports participation is a discrete, planned and time-limited behaviour which has been shown to be relatively accurately assessed by questionnaire (35). The sports participation questions were limited because they did not separate organized and non-organized sports, and there could be different correlates of each type of participation. There were some differences regarding participants with and without valid sports data, with Latino children more likely to be excluded, potentially limiting generalizability of our observations. Recruitment was representative of the San Diego County population (36). Linguistic and cultural differences in questionnaire interpretation may have contributed to differences seen between ethnicities.

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As these results are from an intervention, we must acknowledge that this may have influenced results, though study condition was controlled for in analyses.

Implications

The marked differences between predictors of change in sports participation for Latino and non-Latino children may have implications for intervention development, especially those targeting multiple, or specific ethnic groups. This may be especially important as a systematic review of PA promotion interventions reported that although approximately one third of the included studies in children were targeted at ethnic minorities, little evidence of effectiveness was shown (26). Promoting use of more PA locations for Latinos may be a promising strategy for increasing sports participation. More prospective research investigating predictors of behaviour change in different populations is needed to better determine which aspects of PA behaviour may be best targeted in PA promotion strategies and how these interventions may be best tailored for different ethnic groups.

Conclusions

Factors relating to PA location were identified as predictors of change in sports participation whereas no predictors were identified for non-Latino children. Interventions targeting specific PA behaviours such as child sports participation may need to consider PA locations and be tailored for specific ethnic groups.

Acknowledgments

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Table 1

Baseline characteristics (N=483) (means and SD, unless otherwise stated).

	All participants (n=483)	Latino (n=191)	Non-Latino (n=292)	P value (Latino vs. non-Latino)
Sex N (% girls)	54.9	51.3	57.2	0.20
Age (years)	6.64 (0.70)	6.65 (0.69)	6.62 (0.71)	0.65
BMI z-score	0.65 (0.93)	0.91 (0.96)	0.48 (0.88)	<0.001
Income (%)				
0 (Lowest)	22.6	78.9	21.1	<0.001
1	15.3	56.8	43.2	
2	12.6	26.2	73.8	
3 (Highest)	49.5	19.7	80.3	
Parental education				
Middle school or less	14.9	98.6	1.4	<0.001
High school	14.7	67.6	32.4	
Some college but not graduated	25.9	36.0	64.0	
College Graduate	25.5	17.4	82.6	
Post-graduate work	19.5	6.4	93.6	
Baseline sports participation (days/week)	1.08 (1.14)	1.12 (1.32)	1.06 (1.01)	0.59

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Table 2

Change in sports participation (days/week) (N=483) (means and SD, unless otherwise stated).

		All participants (n=483)		Latino children (n=191)		Non-Latino children (n=292)		P value (Latino vs. non-Latino)
		Mean change (SD)	P value for difference	Mean change (SD)	P value for difference	Mean change (SD)	P value for difference	
Change in Sports Participation	All	0.51 (1.45)	p<0.001	0.68 (1.65)	p<0.001	0.40 (1.30)	p<0.001	P=0.036
	Boys (n=218)	0.51 (1.51)	P<0.001	0.70 (1.65)	p<0.001	0.36 (1.40)	P=0.005	P=0.10
	Girls (n=265)	0.51 (1.41)	P<0.001	0.66 (1.67)	p<0.001	0.43 (1.22)	p<0.001	P=0.19

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Table 3

Ethnic differences in potential predictors of change in sports participation (N=483) (means and SD, unless otherwise stated).

Potential predictor	All participants	Latino	Non-Latino	P value for ethnic differences
Total parental rules (% >6 rules)	62.1	64.7	60.3	0.33
Parental encouragement for PA (days/week)	3.36 (1.79)	3.02 (1.79)	3.57 (1.61)	<0.001
Parental encouragement for less inactivity (days/week)	3.79 (2.48)	4.09 (2.42)	3.59 (2.50)	0.03
Total physical activity equipment at home (n available)	3.99 (1.94)	3.01 (1.78)	4.63 (1.78)	<0.001
(% available and use)				
Bike, tricycle etc.	79.5	71.2	84.9	<0.001
Basketball hoop	28.0	15.7	36.0	<0.001
Balls, Racquets, Bats, Frisbees etc.	73.7	59.7	82.9	<0.001
Roller skates, blades, skateboard etc.	66.7	53.4	75.3	<0.001
Loose equipment (e.g. jump rope, hula hoop)	58.2	41.9	68.8	<0.001
Fixed equipment (e.g. swing set, play house)	37.9	27.2	44.9	<0.001
Water equipment (e.g. canoe, surf board)	23.0	11.0	30.8	<0.001
Swimming pool	31.9	20.4	39.4	<0.001
Child physical activity location (Mean days/week)				
Number of activity locations used ≥ once a week (Mean±SD)	4.05 (2.04)	3.64 (2.14)	4.32 (0.93)	<0.001
Nearest Recreation Centre	0.83 (1.22)	0.87 (1.36)	0.80 (1.13)	0.52
Other Public Facility (e.g. YMCA, Boys and Girls Club)	0.51 (1.12)	0.43 (1.08)	0.57 (1.14)	0.19
Commercial facility (e.g. Gym, Batting cages)	0.42 (0.85)	0.26 (0.78)	0.53 (0.88)	<0.001
School grounds (after-school only)	1.45 (2.03)	1.32 (1.98)	1.54 (2.07)	0.26
School grounds (weekends only)	0.32 (0.89)	0.39 (1.05)	0.27 (0.77)	0.13
Parks or playgrounds	1.57 (1.28)	1.54 (1.38)	1.59 (1.21)	0.70
Walking/hiking/biking trails	1.11 (1.42)	1.16 (1.48)	1.08 (1.38)	0.56
Beach or lake	0.64 (0.81)	0.55 (0.87)	0.71 (0.77)	0.04
Neighbourhood (e.g. vacant lot/field)	1.03 (1.75)	0.86 (1.60)	1.13 (1.83)	0.10