

Do personal-level characteristics moderate neighborhood correlates of physical activity among adult Latinas?

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University of California, San Diego/San Diego State University
Active Living Research Conference 2015

Supported by a diversity supplement from the National Cancer Institute of the NIH (3R01CA138894-04S1)



The Ecological Model for Physical Activity

Environment

e.g., neighborhood aesthetics, perceived safety, accessibility, land-use mix, street connectivity, residential density

Community/Organizational

e.g., media, employer/worksites, community-based orgs

Interpersonal

e.g., social support, certain cultural norms

Intrapersonal

e.g., age, SES, BMI, acculturation

1. Sallis et al., 2006
2. McLeroy et al. 1988
3. Evenson et al., 2002
4. Lopez et al., 2008
5. Evenson et al., 2003
6. Martinez et al., 2009

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Background

- Latino population in the US:
 - 2013: 54 million (17.1%); 2060 projection: 128.8 million (31%)¹
 - 64% of Mexican background¹
- Latinos physical activity (PA):
 - Low levels leisure-time PA² and high levels transportation PA³
 - High activity counts as assessed by accelerometer⁴
- Many Latinos reside in communities that inhibit healthy lifestyles.⁵
- Environment – PA relation among Latinos?

1. U.S. Census Bureau, 2012

2. Marshall et al., 2007

3. US Dept. Transportation, 2000

4. Troiano et al., 2008

5. Flores, 2008

Objectives

1. To examine the association of **perceived neighborhood environmental** factors with domain-specific PA (**leisure-time and transportation**) and **accelerometer-assessed PA** among a sample of Latina women (N=437).
1. To test interactions of **individual-level factors** (e.g., income and acculturation) with perceived neighborhood environmental factors on each PA outcome.

Methods

- Data source: baseline data from *Fe en Acción* [Faith in Action]
 - Randomized controlled trial for PA promotion among inactive Latina women in San Diego County
- Data collection: May 2011 - September 2013
- Recruitment: 16 churches and 437 Latinas (18-65 y)
- Measures:
 - Accelerometer-assessed PA
 - Self-report PA, demographics, and neighborhood environment
 - Objectively-measured anthropometrics

Measures

- Outcomes:
 - GPAQ¹ for leisure-time & transportation PA (9 items total)
 - Low to moderate validity compared to accelerometer among Latina women ($r=0.35$).²
 - Actigraph for moderate-to vigorous PA (MVPA)
- Independent variables:
 - NEWS-A³ and *US Determinants of Exercise in Women Phone Survey*⁴ (9 items total)
 - Neighborhood aesthetics, safety from crime, safety from traffic, access to services within walking distance of home, and sidewalk maintenance
 - Higher scores indicative of more favorable perceptions

1. Armstrong & Bull, 2006

2. Hoos et al., 2012

3. Cerin et al., 2006

4. Evenson et al., 2006

Covariates

- Demographics – education, employment, income, # cars & adults per household (proxy for car access)
- BMI – objectively measured height and weight
- Acculturation – Bidimensional Acculturation Scale (BAS) for Hispanics ¹ (24 items)
 - High internal consistency with Mexican Americans and Central Americans
 - Scores on non-Hispanic domain dichotomized (≥ 2.5 indicative of high levels of Anglo-acculturation)

Statistical Analyses

- Ordinal regression for leisure-time MVPA
 - Categorized: 0, 1-119, and ≥ 120 min/wk
- Logistic regression for transportation PA
 - Dichotomized: 0 vs. any walking/bicycling-related min/wk
- Linear regression for accelerometer-assessed MVPA (min/wk)
- Models adjusted for church clustering, age, & car access.
- Tested interactions: individual-level factors x each neighborhood variable, e.g., income x neighborhood aesthetics

Results

Table 1. Descriptive characteristics of Latinas in San Diego, CA (N=437).

<i>Physical activity levels</i>	
Accelerometer-assessed MVPA, mean (min/wk)	103.1
Leisure-time MVPA (min/wk) (%)	
None	55.6
1 – 119	20.8
≥ 120	23.6
Transportation PA (min/wk) (%)	
None	67.7
Any	32.3
<i>Individual-level characteristics</i>	
Age, mean (y)	44.4
Anglo-aculturated, (%) ^a	32.1
Monthly household income < \$2,000 (%)	58.4
Less than high school completed (%)	54.9
Overweight or obese (%) ^b	83.2
<i>Neighborhood-level characteristics</i>	
Has access to places within walking distance of home (%) (yes)	79.9
Neighborhood feature (mean scores) ^c	
Safety from traffic (1-5 point rating)	3.6
Safety from crime (1-5 point rating)	3.8
Neighborhood aesthetics (1-5 point rating)	3.1
Sidewalk maintenance (1-4 point rating)	3.4

Table 2. Associations of neighborhood characteristics with self-report **leisure-time and transportation PA.**



Neighborhood characteristic	Leisure-time MVPA (n=377) OR ^a (95% CI)	Transportation PA (n=379) OR ^a (95% CI)
Access to places within walking distance of home		
No	1.00	1.00
Yes	0.78 (0.45-1.34)	2.35 (1.12-4.94) 
Safety from traffic	1.00 (0.79-1.27)	0.97 (0.74-1.27)
Safety from crime	1.21 (0.95-1.54)	1.06 (0.81-1.40)
Aesthetics	1.25 (1.02-1.54) 	1.11 (0.88-1.41)
Sidewalk maintenance	0.96 (0.78-1.18)	0.90 (0.71-1.14)

Table 3. Associations of neighborhood characteristics with **accelerometer-assessed MVPA** (n=381).

Neighborhood characteristic	β^a	SE	<i>t</i> -value	<i>p</i> -value
Access to places within walking distance of home	15.41	8.81	1.75	0.08
Safety from traffic	-1.87	3.82	-0.49	0.63
Safety from crime	4.35	3.83	1.13	0.26
Aesthetics	5.25	3.28	1.60	0.11
Sidewalk maintenance	-3.29	3.36	-0.98	0.33

Moderation Results

- Latinas with higher household income and more favorable perceptions of sidewalk maintenance had significantly higher amounts of **leisure time MVPA** than those of lower household income (**OR = 1.54; 95% CI: 1.10-2.16**).

Moderation Results

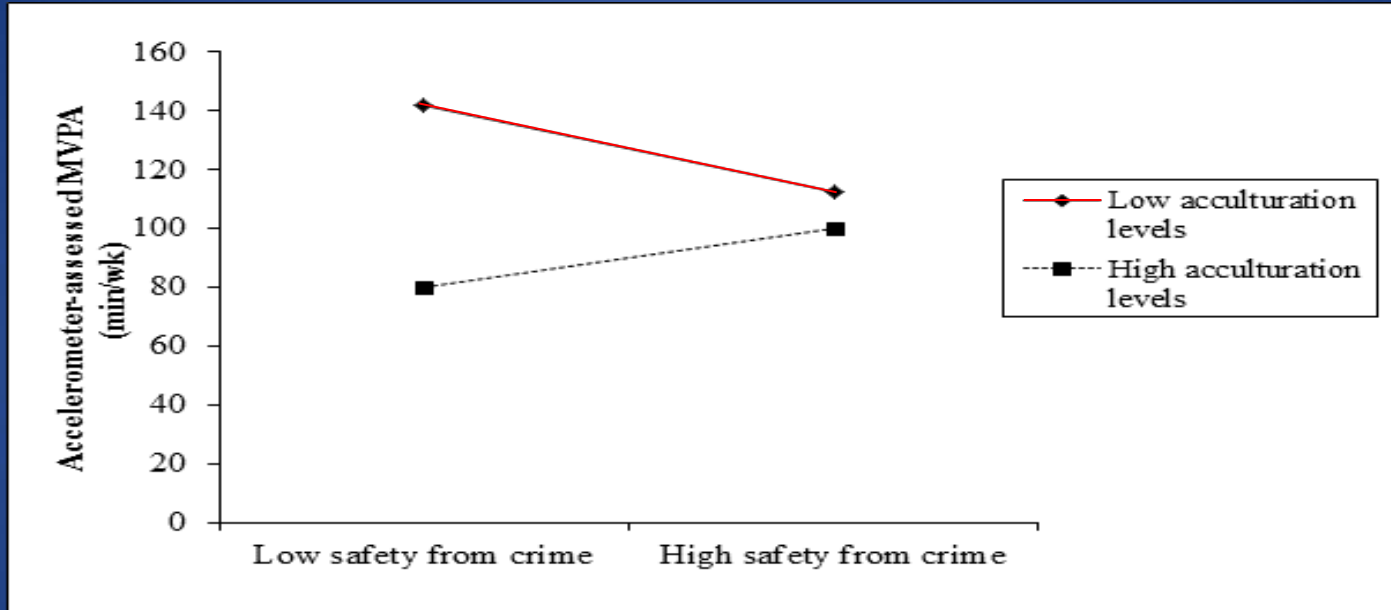


Figure 1. Interaction between Anglo-acculturation status and perceived safety from crime on Latina's **accelerometer-assessed MVPA**.

Interaction beta = 12.50, $p = 0.05$

Moderation Results

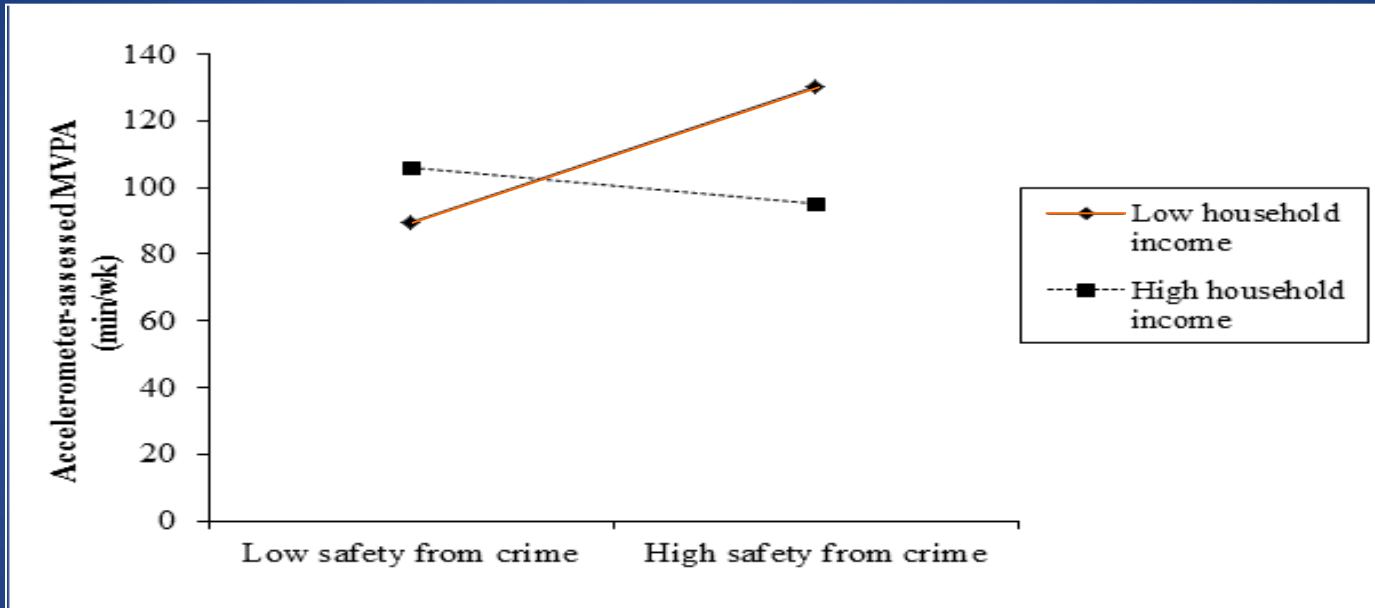


Figure 2. Interaction between household income and perceived safety from crime on Latina's **accelerometer-assessed MVPA**.

Interaction beta = -12.91, $p = 0.04$

Conclusions

- Among this large sample of inactive Latina women, most important environmental-level correlates of PA were:
 - Leisure-time MVPA: better neighborhood aesthetics
 - Transportation PA: having access to places within walking distance of home

Conclusions

- Better sidewalk maintenance (+) associated with leisure-time MVPA only among *higher-income* Latinas.
- Increasing levels perceived safety from crime (+) associated with accelerometer-assessed MVPA only among Latinas with *higher levels of acculturation*.
- Another study reported (+) associations between levels of perceived safety and PA among more affluent/advantaged groups ¹.
- Unexpectedly, increasing levels of safety from crime (+) associated with accelerometer-assessed MVPA among *lower-income* Latinas.

Limitations

- Cross-sectional design does not allow evaluation of cause-and effect relationship.
- Focus on Latina women living in a US-Mexico border community does not allow generalization of findings to Latino men or women of other Latino ethnicity in the US.

Strengths

- One of the first studies to examine interactions between individual-level and neighborhood environment variables on multiple PA measures among Latina women.
- Focus on environmental variables deemed relevant to Latina women. ¹

Public Health Implications

- Improvements to neighborhood environment may only increase PA among certain subgroups of Latinas.
- Interventions aimed at improving neighborhood environment to increase PA levels among Latinas should consider individual-level factors.
- Inconsistent moderation effects of income on neighborhood-PA relation needs further study.

Acknowledgements

- Thank you to co-authors:
 - Elva M. Arredondo, PhD (SDSU; PI)
 - Guadalupe X. Ayala, PhD, MPH (SDSU)
 - John P. Elder, PhD, MPH (SDSU)
 - James F. Sallis, PhD (UCSD)
 - Donald Slymen, PhD (SDSU)
- And to the *Fe en Acción* team and participants

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