Travel patterns & socio-demographic correlates of global positioning system (GPS) derived walking & vehicle trips among churchgoing Latinas

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Introduction: Travel behaviors in Latinos

- Travel behaviors play an important role in public health.
  - *Vehicle Time*: linked to increased obesity\(^1\).
  - *Walking*: Increased walking reduces the risk of CVD\(^2\).

- Latinos:
  - Spend about 59 min/day in a vehicle\(^3\).
  - More likely to walk for leisure related travel than their white counterparts\(^4\).

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1) McCormack & Virk, 2014
2) Boone-Heinonen, et al.,2009
3) US National Household Transportation Survey, 2009
Study Overview

- **Faith in Action/ Fe en Acción**: An ongoing randomized controlled trial to promote physical activity (PA) among church-going Latina adults in San Diego County, CA (N=437).

  - **PALMS Study**: Using PALMS software, Global Positioning System (GPS) and accelerometer data were collected and integrated (N=91).
Physical Activity and Location Measurement System (PALMS)

• A web based software designed to merge and process time stamped data (HR monitors, accelerometers, and GPS devices)\(^1\).

• Calculations can be used to look at variables of interest (transportation modes)\(^2,3\)

1) “UCSD-PALMS-Project - PALMS Overview,”
2) Carlson et al., 2015
3) Kerr et al., 2012
PALMS/Fe en Acción

Activity Intensity for One Participant

Activity Intensity
- Sedentary
- Light
- Moderate

Transport Mode: Vehicle

Transport Mode: Stationary

Transport Mode: Pedestrian
Objectives

(1) To characterize walking and vehicle trips (number of trips, time, and distance) in adult Latinas living in a border community and

(2) To examine socio-demographic correlates of these transportation-related behaviors.
Measures: Individual Level

- Survey data was collected at baseline that included:
  - Socio-demographic variables (from survey):
    - Education: categorized into below high school and completed high school or above
    - Income: categorized into less than $2,000 and $2,000 + per month
    - Employment Status: categorized into being employed or not
    - Children living in the household: children < 18 living at home
    - Acculturation: Bi-dimensional Acculturation Scale (BAS) Scale for non-hispanic domain, that was dichotomized into low/high adherence¹
    - Drives Vehicle: yes or no
  - Body weight status: calculated BMI from objectively measured height and weight, then categorized into normal, overweight, and obese.

¹ Marin & Gamba, 1996
Measures: Walking & Vehicle Patterns

- Integrated GPS and accelerometer data using PALMS
  - From PALMS, a Participant level dataset was created which summarized data for travel modes.
  - For analysis, at least 2 days of device wear, minimum 8 hours/day were required
  - Final sample of 88 participants

- Transportation Variables (separate variables for walking and vehicle trips):
  - # of trips (trips/day)
  - distance traveled across days (km/day)
  - time in trips (min/day)
Statistical Analyses

- Descriptive statistics and frequencies for demographics and walking/vehicle patterns
- Bivariate associations to test for relationship between individual level characteristics and walking & vehicle time
  - Controlling for church as a covariate
Table 1. Characteristics of Latina women (N=88), *Fe en Acción/PALMS*, San Diego, CA.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean or %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>45.3</td>
</tr>
<tr>
<td>Mexico-born</td>
<td>84.1%</td>
</tr>
<tr>
<td>Married/Living as married</td>
<td>72.7%</td>
</tr>
<tr>
<td>Employed (yes)</td>
<td>67.05%</td>
</tr>
<tr>
<td>Monthly household income &lt; $2000</td>
<td>59.09%</td>
</tr>
<tr>
<td>&lt; High School Education</td>
<td>55.68%</td>
</tr>
<tr>
<td>Anglo-acculturated (yes)</td>
<td>31.82%</td>
</tr>
<tr>
<td>Overweight or obese</td>
<td>85.23%</td>
</tr>
<tr>
<td>Drives vehicle (yes)</td>
<td>73.86%</td>
</tr>
</tbody>
</table>
Results

Number of trips per day

Average daily # of trips across days

Walking: 1.69
In a Vehicle: 4.69
Distance traveled per day

Average daily distance traveled across days (km/day)

- Walking: 0.67
- In a Vehicle: 41.13
Minutes per day

Average daily time in trips (min/day)

- **Walking**: 15.09 minutes
- **In a Vehicle**: 65.74 minutes
Relationship between walking (min/day) and individual level characteristics (controlling for church)
Relationship between vehicle time (min/day) and individual level characteristics (controlling for church)
Conclusions

- Latinas are doing more walking, but also more driving than the average population (National Transportation Household Survey, 2009)
- Target overweight/obese participants for walking promotion
- Health promotion messages should be tailored to reach higher SES populations, due to their high amount of vehicle time.
**Strengths/Limitations**

**Strengths**
- Use of accelerometer/GPS devices to objectively assess transportation-related variables
- One of the first to objectively assess travel patterns in a Latina sample

**Limitations**
- Use of cross sectional data limits ability to examine causality
- Small sample size
- Potential misclassification error
Implications for Practice & Policy

- Walking is an important contributor of PA in Latinos, especially among normal weight Latinos
  - Infrastructure that is supportive of walking is needed
  - Although walking is beneficial to health, other forms of PA are needed to help meet guidelines

- Vehicle time is high, especially among those of higher SES
  - Why is this going on?

- Next steps include examining environmental and psychosocial factors
Acknowledgements

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Thank You!

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References


