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Short Report

The importance of being parsimonious: Reliability of a brief community walkability assessment instrument

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ABSTRACT

This research presents the *Leyden Walkability Instrument* (LWI), a brief survey checklist designed to measure the perceived walkability of a neighborhood or community where a respondent lives. The reliability of this instrument was tested using the intra-class correlation and found to be moderately substantially reliable (Landis–Koch rating) in every survey item (ranging from .54 to .76 and ranging in observed agreement from 72.8% to 93.9% with an overall instrument score of .71 and an observed agreement of 81.6%). The LWI is discussed in the context of other survey instruments designed to measure perceived walkability and found to be a useful addition because of its brevity and ease of use.

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1. Introduction

The health and economic benefits of regular physical activity and particularly walking are well documented (Lees and Booth, 2005, Booth and Chakravarthy, 2002; Mokdad et al., 2004; Colditz, 1999; Jones and Eaton, 1994). Health surveillance surveys conducted in the United States, however, indicate that Americans get far too little physical activity. In 2008, for example, the Center for Disease Control and Prevention (CDC) found that nearly 25% of the respondents in the Behavioral Risk Factor Surveillance System (BRFSS) had not participated at all in any physical activity in the month before being surveyed (Center for Disease Control, 2008). Recently research has emphasized the built environment as one important influence on community physical activity behavior, especially walking (Saelens et al., 2003. See also Robert Wood Johnson Foundation, 2009). Unfortunately, many individuals live in areas lacking physical activity settings (e.g. parks, sidewalks, and trails) and/or proximal destinations within walking distance. This is seen as a principal challenge in promoting health through physical activity in the United States (Department of Health and Human Resources, 2000), and may be relevant to other countries as well.

Interdisciplinary teams have worked together to characterize a "walkable" environment as one with minimal perceived distance between trip origins and destinations achieved through a highly connected network of streets with a high density of mixed-used facilities (Saelens et al., 2003; Brownson et al., 2009). Research has yielded reliable, though lengthy, self-report walkability survey instruments (Brownson et al., 2004). It is our contention that community walkability assessment surveys must now be made more "user friendly" and parsimonious for use by community decision makers and researchers who are often limited in time and financial resources. While excellent for community research, the three instruments most frequently used to date are the *San Diego, St. Louis,* and *South Carolina instruments* (available at http://www.slu.edu/colleges/sph/slusph/centers/prc/articles.htm) contain 98, 104, and 61 items, respectively, and take approximately 25–30 min to administer (Brownson et al., 2004).

The purpose of the current study was to assess the reliability of a parsimonious neighborhood walkability survey instrument that can be used by decision makers as a "quick and dirty" tool for assessing the physical activity friendliness of a community. In simple checklist we label the "*Leyden Walkability Instrument*" (LWI), was assessed as part of the *West Virginia (WV) Walks*, a social marketing campaign to promote walking in north central WV (Reger-Nash et al., 2008). The validity of this instrument is discussed elsewhere (Leyden, 2003).

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2. Methods

2.1. The WV Walks campaign

WV Walks, patterned after *Wheeling Walks* (Reger-Nash et al., 2002, 2005) was implemented in 2005 in Morgantown, WV to stimulate inactive 40–65-year olds in north central WV to walk 30 min or more daily. Cabell County, WV served as the comparison community because its largest city, Huntington, is very similar to Morgantown (Leyden et al., 2008). *WV Walks* included an eight week high-intensity mass-media campaign that used paid media advertising, media relations, and community activities to promote walking in March and April, 2005 (Reger-Nash et al., 2002).

2.2. Sampling procedure and survey

Pre- and post-campaign telephone surveys were administered to a random sample of 40–65-year old county residents in the target and comparison communities to assess the effectiveness of the campaign. Baseline surveys were completed prior to campaign launch by 1223 and 611 residents in the target and comparison communities, respectively. Post-campaign surveys were completed approximately three months, hence by 76% (n=918) of baseline respondents in the target community and 72% (n=437) in the comparison community (Reger-Nash et al., 2002).

Community members were asked about their physical activity patterns and built environment as part of the 42-question campaign effectiveness telephone surveys. The built environment was assessed using 11 items from the 98-item *San Diego Instrument* and a brief 15-destination checklist instrument, the *Leyden Walkability Instrument* (LWI), originally developed for use in Galway, Ireland (Leyden, 2003) and adjusted to be culturally appropriate for use in the United States. In a separate study, the LWI was adapted for a study examining the relationship between perceived neighborhood walkability and self-reported health in Texas (Rohrer et al., 2004). The 11 items from the *San Diego Instrument* were chosen because they had already proven to be reliable in previous research, were considered standard measures of walkability (e.g., the existence of sidewalks and crosswalks and barriers associated with traffic), and because some were especially pertinent to West Virginia and the *WV Walks* campaign (such as items asking about hilliness or whether there were walking groups in the city). Cost and time limitations as well as multiple research foci prevented the inclusion of the entire 98-item *San Diego* Instrument.

The *Leyden Walkability Instrument* (LWI) asks respondents to indicate whether or not they could walk to 15 common destinations (e.g. a store, work, or a restaurant) "without too much trouble." These items were developed based on extant research findings that the proximity of utilitarian destinations (e.g. retail, restaurants, and services) is correlated with increased likelihood of walking (Saelens et al., 2003; Krizek and Johnson, 2006; Lee and Moudon, 2006), amount of walking by older women (King et al., 2003), number of walking trips people report taking (Saelens et al., 2003; King et al., 2003), and is the most effective method of measuring perceived walkability (Lee and Moudon, 2006). It is our contention that respondents can use this simple checklist to quickly summarize a number of additional factors commonly associated with perceived walkability such as hilliness, aesthetics, connectivity, speed of vehicular traffic, the availability of sidewalks and crosswalks, and safety. It is important to note that many disciplines use a single-item proxy question to measure and explain a wide variety of complex attitudes and behaviors. Political scientists, for example, typically use a simple seven-point party identification scale to reliably account for a significant degree of variation in individual level voting behavior and policy preferences (American National Election Study).

2.3. Statistical analysis

Reliability of each item in both instruments and overall instrument scores for the LWI and the subset of *San Diego Instrument* questions used in *WV Walks* were assessed using a single measure intra-class correlation coefficient (ICC) derived from a one-way random effect model. Responses were coded and analyzed using the SPSS (Version 11.0) for analysis. The analysis included cases from both the target and comparison communities, as the actual effect of the campaign on these specific walkability questions is assumed to be very minimal. The following categories of agreement were used for the ICC as suggested by Landis and Koch: 1.00–0.81—almost perfect agreement; 0.80–0.61—substantial agreement; 0.60–0.41—moderate agreement; 0.40–0.21—fair agreement; 0.20–0.01—slight agreement; and less than 0.00—poor agreement (Landis and Koch, 1977).

Table 1
Reliability of items from *Leyden Walkability Instrument* (LWI)[a].

Items	Observed agreement (%)	ICC	Landis–Koch rating
Overall instrument	**86.1%**	**.71**	**Substantial**
Could walk to....			
A corner convenience store	85.5%	.71	Substantial
A place of worship	81.8%	.64	Substantial
A park or playing field	84.7%	.69	Substantial
A local school	87.5%	.75	Substantial
A community or recreation center	83.1%	.55	Moderate
A child care facility	87.0%	.65	Substantial
A drug store	89.0%	.76	Substantial
A bar or pub	87.3%	.73	Substantial
A restaurant or coffee shop	84.3%	.68	Substantial
A grocery store	86.6%	.69	Substantial
A movie theater	93.9%	.66	Substantial
A library	90.1%	.74	Substantial
A bank	88.2%	.75	Substantial
A post office	90.1%	.77	Substantial
The place that you work	72.8%	.54	Moderate

[a] Available at http://ajph.aphapublications.org/cgi/content/full/93/9/1546/F1

Table 2
Reliability of Item subset from *San Diego Instrument*.

Item	Observed agreement (%)	ICC	Landis–Koch rating
Overall instrument	**59.6**	**.66**	**Substantial**
Streets in neighborhood are hilly making walking there difficult	54.3	.58	Moderate
There are sidewalks on most of the streets in my neighborhood	77.5	.79	Substantial
Surroundings are attractive while walking in my neighborhood	61.6	.53	Moderate
Neighborhood streets are well lit at night	64.0	.71	Substantial
So much traffic makes it difficult/ unpleasant to walk	52.1	.54	Moderate
Speed of traffic on nearby streets is usually slow	50.3	.52	Moderate
Crosswalks and signals aid walking help walkers cross busy streets in neighborhood	71.4	.53	Moderate
Local Government should invest more tax dollars in sidewalks/trails	70.0	.52	Moderate
Lots of walking groups in my city or area	51.7	.57	Moderate
Lots of walking events in my city or area	54.2	.59	Moderate
My city is very interested in promoting walking	53.7	.59	Moderate