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Neighborhood Environment Walkability Scale for Youth (NEWS-Y): Reliability and relationship with physical activity

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ABSTRACT

Objectives. To examine the psychometric properties of the Neighborhood Environment Walkability Scale-Youth (NEWS-Y) and explore its associations with context-specific and overall physical activity (PA) among youth.

Methods. In 2005, parents of children ages 5–11 ($n=116$), parents of adolescents ages 12–18 ($n=171$), and adolescents ages 12–18 ($n=171$) from Boston, Cincinnati, and San Diego, completed NEWS-Y surveys regarding perceived land use mix-diversity, recreation facility availability, pedestrian/automobile traffic safety, crime safety, aesthetics, walking/cycling facilities, street connectivity, land use mix-access, and residential density. A standardized neighborhood environment score was derived. Self-reported activity in the street and in parks, and walking to parks, shops, school, and overall physical activity were assessed.

Results. The NEWS-Y subscales had acceptable test–retest reliability (ICC range .56–.87). Being active in a park, walking to a park, walking to shops, and walking to school were related to multiple environmental attributes in all three participant groups. Total neighborhood environment, recreation facilities, walking and cycling facilities, and land use mix-access had the most consistent relationships with specific types of activity.

Conclusions. The NEWS-Y has acceptable reliability and subscales were significantly correlated with specific types of youth PA. The NEWS-Y can be used to examine neighborhood environment correlates of youth PA.

Introduction

Fewer than half of children ages 6 to 11, and less than 10% of 12 to 19 year olds meet physical activity guidelines in the United States (Troiano et al., 2008), so activity interventions are needed that can affect populations. Features of the built environment are related to physical activity among youth (Davison and Lawson, 2006; Sallis et al., 2006; Timperio et al., 2005), and changes in built environments could have widespread and long-term effects. In adults, some environmental correlates are known to be specific to type of activity (Giles-Corti et al. 2005; Owen et al., 2004). Some evidence for this exists among youth as well. For example, recreational physical activity of youth has been associated with characteristics of physical activity facilities in the neighborhood (Heitzler et al., 2006; Ellaway et al., 2007; Cohen et al., 2006; Roemmich et al., 2006). Walking and cycling for transportation by youth have been associated with community design and transportation attributes such as distance to destinations, sidewalks, and traffic safety (Yeung et al., 2008, Evenson et al., 2006; Kerr et al., 2006; Nelson et al., 2008; Boarnet et al., 2005). Total youth physical activity has been related to both recreation and community environments (Kligerman et al., 2007; Norman et al., 2006).

Young people do physical activity in a variety of specific locations (Grow et al., 2008; Hoefer et al., 2001) and engage in different types of activities in places such as parks and streets (Babey et al., 2008; Falb et al., 2007). Studies are beginning to examine environmental correlates of location-specific physical activities (Forman et al., 2008; Durant et al., 2009; Grow et al., 2008).

The Neighborhood Environment Walkability Scale (NEWS) was developed to assess environmental factors hypothesized to influence physical activity (Saelens et al., 2003). The NEWS demonstrated good reliability among adults in several countries (Brownson et al., 2004;

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De Bourdeaudhuij et al., 2003; Leslie et al., 2005). The validity of an abbreviated version (NEWS-A) was supported (Cerin et al., 2006), but the ability of the NEWS or NEWS-A to explain physical activity of children and adolescents has been insufficiently studied (Mota et al., 2005).

A version of the NEWS relevant to youth, which can be completed by parents of younger children or adolescents themselves, is needed to further research on the built environment impacts on physical activity among youth. The first aim of the present study was to examine the measurement properties of a new measure, the NEWS for youth (NEWS-Y), when completed by adolescents and parents of children and adolescents. The second aim was to assess relationships between NEWS-Y scales and physical activities of youth undertaken in specific places.

Methods

Participants and recruitment

Three groups of participants completed the study. The first group consisted of parents who completed the study on behalf of their child, aged 5–11 years. The parents of children ($n = 116$) were on average 39.6 years old, 77.6% white, and 86.1% female. The children for whom the parents reported had a mean age of 8.3 years and were 52.2% female. The second group of participants was parents who completed the study on behalf of their adolescents, aged 12–18 years. The parents of adolescents ($n = 171$) had a mean age of 45.0 years, were 57.3% white, and were 80.5% female. The final group of participants consisted of 171 adolescents (M age = 14.6, 50.7% female, 57.5% white) who completed the study on their own behalf and had a parent who was in the second group of participants. Thus, there were 171 parent-adolescent pairs. Participants were recruited from the San Diego, Boston, and Cincinnati areas; the details of the recruitment procedure are described elsewhere (Durant et al., 2009). Briefly, several recruitment strategies were used, including random selection from neighborhoods chosen to vary on walkability and income, as well as recruitment at schools, recreation centers, and community events. Human subjects approval was obtained from appropriate institutions in each city. Across sites, 74% of parents and 62% of adolescents who completed a survey at time 1 also completed a survey at time 2 for test–retest reliability.

Measures

Built environment

Participants completed a new youth-focused Neighborhood Environment Walkability Scale (NEWS-Y) and survey items assessing physical activity in various locations. To create the NEWS-Y, the abbreviated NEWS (NEWS-A; Cerin et al., 2006) was adapted for youth. Simplifications in wording were made to the NEWS-A scales to make items easier to understand for the adolescent version (e.g. the types of residences people live in were simplified). Parent versions were worded to reflect that the parent was responding on behalf of their child. Some items, pertaining especially to youth, were added. For example, on the crime safety scale, four items were added about fear of being taken or hurt by a stranger. Modifications were made using expert opinion and formative interviews with children, adolescents and their parents (Forman et al. 2008). For the current study, the NEWS-Y was summarized into the eight subscales from the original NEWS (Saelens et al., 2003) including land use mix-diversity, pedestrian and automobile traffic safety, crime safety, neighborhood aesthetics, walking/cycling facilities, street connectivity, land use mix-access, and residential density. An additional scale, not part of the original NEWS, was developed, recreation facilities within a 10 min walk from home. Table 1 describes the subscales, including sample items and response scales. An overall neighborhood environment score was created by calculating *z*-scores for each of the nine subscales and summing them. Higher scores indicate a more walkable environment.

Physical activity

Physical activity items assessed frequency of walking to/from school, doing physical activity in the street, walking to a park, walking to shops, and

Table 1
Subscales on the NEWS-Y with descriptions, scoring, test–retest intraclass correlation coefficients (ICC), Cronbach's alphas, and parent-adolescent intraclass correlation coefficients (ICCs) for each.

	# items	Example items, response options, and scale creation	Adolescents ($N = 120$)	Parents of adolescents ($N = 120$)		Parents of children ($N = 94$)		Parents vs. adolescents time 1 ($N = 171$)	
			ICC	Alpha	ICC	Alpha	ICC	Alpha	ICC
Land Use Mix-diversity	20	How long would it take to walk to shops, services, and other destinations (e.g. supermarket, post office, library) 1 = 1–5 min; 5 = 31+minutes Sum of destinations within a 10 min walk.	0.87	0.93	0.77	0.87	0.80	0.89	0.77
Pedestrian and automobile traffic safety	7	There is so much traffic on nearby streets that it is unpleasant to walk, the speed of traffic is usually slow, streets have good lighting 1 = strongly disagree, 4 = strongly agree. Responses averaged (higher scores indicate better perceived safety).	0.67	0.81	0.66	0.79	0.74	0.85	0.52
Crime safety	6	High neighborhood crime rate, worried about being outside alone because of being taken or hurt by a stranger, worried about being in a park because of being taken or hurt by a stranger 1 = strongly disagree, 4 = strongly agree. Responses were reverse scored and averaged (higher numbers indicate lower perceptions of crime/more safety).	0.73	0.87	0.78	0.87	0.87	0.93	0.53
Neighborhood Aesthetics	3	In my neighborhood there are trees, there are interesting things to look at 1 = strongly disagree, 4 = strongly agree Responses average (higher numbers indicate better aesthetics).	0.60	0.75	0.61	0.76	0.75	0.86	0.44
Walking/cycling facilities	3	In my neighborhood there are sidewalks, sidewalks are separated from traffic, there is grass/dirt between the streets and sidewalks 1 = strongly disagree, 4 = strongly agree. Responses averaged (higher scores indicate better pedestrian infrastructure).	0.66	0.79	0.68	0.81	0.79	0.89	0.59
Street connectivity	3	Streets in my neighborhood do not have many cul-de-sacs, there are many different routes for getting from place to place 1 = strongly disagree, 4 = strongly agree. Responses averaged (higher scores indicate better street connectivity).	0.58	0.74	0.61	0.75	0.56	0.72	0.47
Land use mix-access	6	Stores are within easy walking distance of my home, it is easy to walk to a transit stop, streets are hilly 1 = strongly disagree, 4 = strongly agree. Responses averaged (higher scores indicate better access).	0.56	0.72	0.64	0.78	0.73	0.84	0.57
Residential density	4	How common are different types of homes in the neighborhood 1 = there are none, 5 = all residences are (e.g. stand alone one family homes, apartments). Weights applied to each type of housing to estimate the density and responses were averaged (higher scores indicate higher density).	0.62	0.77	0.71	0.83	0.82	0.90	0.58
Recreation facilities	14	How long would it take to walk to types of recreation destinations (e.g. swimming pool, basketball court, parks) 1 = 1–5 min, 5 = 31+minutes. Sum of facilities within a 10 min walk.	0.72	0.83	0.67	0.80	0.73	0.84	0.55

Participants were from Boston, Cincinnati, and San Diego, USA and completed the study in 2005.