Sociocultural perceptions of walkability in Mexican American neighborhoods: Implications for policy and practice

Maia Ingram[a], **Arlie Adkins**[b], **Krista Hansen**[a], **Vanessa Cascio**[c], **Evren Somnez**[c]

[a]University of Arizona, College of Public Health 1295 N. Martin, Tucson Arizona 85721 USA

[b]University of Arizona, College of Architecture, Planning and Landscape Architecture, 1040 N. Olive Rd., Tucson, AZ 85719 USA

[c]Living Streets Alliance, 439 N. 6th Ave., Tucson, AZ 85709 USA

Abstract

Walking is the most fundamental form of active travel, as well as the most popular form of physical activity. The built and social environment, however, may not adequately support active living, especially in low-income communities. While improving the walking infrastructure is essential, assumptions regarding perceptions of walkability based on a standardized norm may fail to address preferences within specific populations. Particularly in low-income and ethnically diverse urban environments, it is not clear whether objective or perceived measures provide the best assessment of an environments' conduciveness to walkability. This qualitative study of five Mexican American neighborhoods used walk-and-talk focus groups (n=20) and intercept surveys (n=108) to investigate residents' perceptions of their walking environments. Respondents differentiated between physical and social attributes in assessing neighborhood walkability. Physical attributes, such as lack of infrastructure, maintenance and traffic, were more salient to residents when describing what discouraged them from walking. Perceptions of the social environment appeared to be of greater significance than the physical environment in encouraging individuals to walk. While respondents were concerned about personal safety, the overall sociability of the neighborhood, nearby family, familiarity between neighbors, and a sense of social activity all contributed to a positive assessment of walkability and expressed desire to walk, Findings revealed complex interactions between characteristics of the social, built, natural, and policy environments. The emphasis on sociocultural influences on perceptions of walkability underscores the importance of engaging neighborhoods in conversations about their walking environments to reveal strategies that better serve the needs of residents.

Introduction

Active living is a recently popularized concept that encourages individuals to achieve recommended levels of physical activity through a lifestyle that integrates active transportation such as biking and walking into daily routines (Sallis et al., 2006). Walking is the most fundamental form of active travel, as well as the most popular form of physical activity across all ethnicities, ages and abilities (Berrigan & Fulton, 2012). With respect to

Corresponding Author: (520)275-6369, maiai@email.arizonan.edu.

health impact, there is a direct relationship between walkable environments, walking and health outcomes (Frank et al., 2006; Giles-Corti et al., 2016; Riggs & Steiner, 2017; Sallis et al., 2016). Even modest physical activity expenditures result in substantial individual health benefits, including a 30% reduced risk of all-cause mortality (Lee & Skerret, 2001). While the benefits of walking are well documented, built and social environments may not adequately support active living, especially in low-income communities (Brownson et al., 2009). Communities that most suffer from a lack of pedestrian infrastructure are least likely to benefit from the national trend toward urban planning efforts designed to increase an active lifestyle. Low-income communities and neighborhoods dominated by ethnic minorities have more issues with pedestrian safety (Cutts et al., 2009; Weiss et al., 2011), and markedly less access to neighborhood parks and other recreational facilities (Gordon-Larsen et al.,, 2006; Powell et al., 2006; Wolch, Wilson, & Fehrenbach, 2005). Inequalities can be traced to disparities in the planning process; lower-income counties in the U.S. with a higher percentage of non-whites are less likely to have land use plans supportive to active living (Aytur et al., 2008).

The importance of physical activity in maintaining a healthy lifestyle underscores the need to address disparities in access to safe, convenient, and comfortable walking environments in low-income, minority neighborhood (Blacksher & Lovasi, 2012; Frohlich & Potvin, 2008). While improving the walking infrastructure is essential, assumptions regarding perceptions of walkability based on a standardized norm may fail to address preferences and needs of specific populations (Adkins et al., 2017). Particularly in low-income and ethnically diverse communities, it is not clear whether objective or perceived measures provide the best assessment of an environments' conduciveness to walking (Adkins et al, 2017.; Arvidsson, Kawakami et al., 2012; Gebel et al., 2011; Koohsari et al., 2015). One study of objective attributes of walkability and neighborhood satisfaction reported an unexpected inverse relationship; the negative associations between walkability and neighborhood satisfaction were mediated by perceptions of safety and pollution (Dyck et al., 2011). This finding may reflect differing priorities in urban, economically disadvantaged communities where socioeconomic status influences perceptions of both traffic and crime (Day, 2006). Conversely, focusing solely on the negative implications of socioeconomic status may miss opportunities to improve urban environments in creative ways that respond to the priorities of residents (Carpiano, 2006). Urban environments, for example, have a higher density of walking destinations and thus greater potential for social interaction (Day, 2006). In this paper, we report findings of a qualitative study of factors that influence perceptions of walkability in five predominantly Mexican American neighborhoods in the Southwest region of the U.S., with a broader aim of exploring sociocultural factors related to preferences in the walking environment that may be neighborhood specific.

Neighborhood Walkability

Studies of the built environment have identified objectively measured features of neighborhoods that impede or facilitate walking. These physical characteristics include the existence of sidewalks, street lighting, street connectivity, proximity to commercial walking destinations, high traffic speed or volume, public transportation, and shade or vegetation (Ding et al., 2011; McCormack & Shiell, 2011; Sallis, 2009). While these objective

measures provide the most accurate assessment of the built environment, they fail to capture how individuals perceive their neighborhood. Perceived measures more clearly describe an individual's relationship to their environment, which in turn, may influence the likelihood that he or she will walk (Adkins et al., 2012). Perceptions of the physical environment may differ from objective observation and be influenced by the social relationships that exist within the neighborhood as well as by historical and cultural perspectives (Fullilove, 2001; Otero, 2010).

Social ecological models provide a framework to understand how walking is influenced by environmental attributes at different levels (Sallis et al., 2008). As laid out in Sallis et al.'s (2008) ecological model of active living, the amount a person walks is influenced by individual and household characteristics along with elements of the built and natural environment, sociocultural environment, and policy environment. Alfonzo's hierarchy of walking needs (2005) is another ecological model that seeks to elucidate factors that inform the decision making process across different types of locations (Alfonzo, 2005). While the relationship to walking is not necessarily linear, the model suggests that walking must first be feasible in terms of individual capacity and second accessible in terms of immediate infrastructure for walking and walking destinations. This model suggests that safety and comfort are higher level needs that are considered after feasibility and accessibility have been established. Sallis and others have noted the need for research exploring interactions between the different levels of ecological models as they relate to walking, for example, investigating the impact of sociocultural context on the effectiveness or appropriateness of programs and policies aimed at encouraging walking.

While there is evidence that social relationships within neighborhoods are important to the wellbeing of residents (Cramm et al., 2013), little is known about their influence on perceptions of walkability. Social relationships are positively associated with better health among Mexican Americans (Shavitt et al., 2016), and one study that found that residents in high-density Mexican American neighborhoods in the U.S. Southwest have lower prevalence of disease and related mortality compared to those living in low-density Mexican American neighborhoods (Eschbach et al., 2004). The sociocultural characteristics of a neighborhood thus counteract the negative implications of neighborhood poverty for this population. The positive nature of the intersection between place and social relationships deserves further exploration, particularly given the importance of preserving these outcomes as neighborhoods diversify and disperse over time. From the vantage point not only of the health benefits of increased walking, but also of addressing equity in the development of safe and comfortable walking environments, it is essential to study differences in needs and priorities among specific groups and populations. In initiating this effort in southwest Mexican American neighborhoods, we applied innovative research methods in an effort to gain social, cultural and historical perspectives from residents who walk for pleasure, by choice, or as a means of transportation.

Methods

The study utilized community-engaged and qualitative methods designed to elicit an array of factors that may be relevant to perceptions of walkability within the social, economic and

cultural context of predominantly Mexican American/Mexican origin neighborhoods in Tucson, Arizona. Academic partners included both a college of architecture, planning, and landscape architecture and a college of public health. The community partner was a local agency responsible for promoting alternative modes of transit in the city through outreach, education, and advocacy. Their experience in engaging community members in discussions about walkability, the strength of their relationships with the neighborhoods of interest and their ability to follow up with programs and services were all essential to the research process. Neighborhoods were selected primarily based upon their ethnic composition documented in 2010 census data (Table 1). Secondarily, we used characteristics of the neighborhoods, such as the presence of an elementary school, recreational space, or nearby business district, that might be relevant to walking. The five neighborhoods were between 72% and 89% Hispanic and varied in size between .6 and 4.3 square miles.

Design

The study was conducted in two phases, walk-and-talk focus groups and intercept surveys. A walk-and-talk focus group is a place-based discussion that uses visual cues while walking through a physical and social environment to prompt facilitated group conversations about walkability and barriers to active transportation in participants' neighborhoods. First, the local agency held meetings with the staff of the city ward offices to ensure that city officials were aware of our activity and to elicit their assistance in recruitment. We then disseminated flyers in gathering places in the neighborhood requesting that they contact the agency for more information. The local agency conducted a scan of the area identifying a site where the group could gather and developed a route of approximately ½ mile that captured the various qualities of the neighborhood. Each group lasted approximately two hours. The initial 30 minutes were spent in the gathering place with a general discussion about participants' walking behavior and preferences. Participants then walked together engaging in side discussions about observations of the environment that, in general, might hinder or facilitate walking. Every block or two, the group stopped for a facilitated discussion about the landscape they had just walked through. We conducted a walk and talk focus group in four of the five target neighborhoods (n=20). The group facilitators Sony digital voice recorders with low-cut filter to eliminate unwanted background noise and had three tape recorders to catch side conversations.

Intercept surveys, which were essentially brief on-street interviews, were added to the study for two reasons. The first was to further explore overarching themes from the focus groups. Second, it was clear that the focus groups mostly represented people who had access to cars and were interested in walking as a choice rather than a necessity. With the intercept survey, we sought to access the opinions of those in the act of walking in their neighborhood either by necessity or by choice. This was important because focus groups participants tended to be engaged in their neighborhood associations and were somewhat more aware of the local political process for addressing neighborhood needs. In fact, one focus group participant who we recruited directly on a neighborhood street remarked that no one had engaged her in these issues before. By adding the intercept survey, we thus gained an array of perspectives from those who used walking as active transport to those who walked as leisure.

After an initial thematic analysis of the focus groups, we drafted a one-page survey that included both open-ended questions oriented toward better understanding what makes them want to walk or not want to walk in the neighborhood. We piloted the survey and made revisions designed to avoid leading respondents toward either physical or social attributes. We conducted the survey on two to three occasions in each neighborhood at different times of day in order to capture people walking for a variety of reasons. After finding it difficult to find enough people walking in the smallest of the four neighborhoods, we conducted the intercept survey in a fifth neighborhood (n=118). In all, we conducted walk and talk focus groups and intercept surveys in three neighborhoods, only the focus group in one neighborhood and only the intercept survey in one neighborhood (Table 2). Inclusion criteria for participants in both activities was 18 years of age and older. All study activities were conducted under review of the Institutional Review Board.

Analysis

We analyzed the data using N-Vivo software in a theoretically-driven and consensus-building process (Onwuegbuzie & Teddlie, 2003; Patton, 2002). For the purpose of analysis, we combined the focus group and intercept survey data into one data set. We began with broad categories that included 'physical environment' and 'social environment" as the two areas of interest. We created a codebook of potential themes or factors related to walkability based on existing literature, which we then confirmed and expanded upon during the coding process. Street maintenance and litter, sidewalks, lighting, street condition, public space traffic were all coded as aspects of the physical environment. For the social environment, children, personal security, social interaction, dogs, the homeless, and neighborhood identity emerged in relation to the walking environment. Within each of these themes, sub-themes described the responses that emerged directly from our data. Two researchers coded all the data individually. The research team then reviewed each theme, coming to consensus regarding the definitions and additional themes. From this second stage of analysis, we added social cohesion and history of the neighborhood as themes within the social environment. Under the physical environment, we added bus stops.

Results

Table 2 shows the number and characteristics of individuals participating in the data collection activities. Reflective of actual neighborhood demographics, 78% of the participants were Hispanic/Latino and half (51%) were female. For the most part, focus group participants represented residents who were engaged in their community and who wanted to walk. The intercept survey was successful in capturing a broader range of motivations for walking. Among respondents, 31% were on errands or going shopping. Other destinations included to or from a bus stop (21%), work (13%), school (8%), home (8%) and a social service agency (4%). A relatively small percentage expressed walking for social reasons (6%), to the park (3%) or specifically for exercise (6%). More than half of the participants in our study did not have access to a car, considerably higher than the 5% of Tucson households without a car, but not surprising considering our sampling strategy for the intercept surveys of talking to people who were walking.

Table 3 illustrates describes the themes and subthemes that describe the physical and social attributes of the neighborhood environment related to walking. In general, an attribute was either positively or negatively associated with walkability. The table thus illustrates the most salient themes that emerged as motivating or discouraging people to walk.

Physical environment

Nearby parks and other public spaces such as a community garden were frequently mentioned as beneficial and desirable destinations. The presence and convenience of businesses were more often mentioned than their quality, although the availability of good food was notable in one neighborhood. School, community centers, and a library were important destinations and respondents were aware of the role they played as destinations for youth:

> "There's a Boys and Girls' Club over there… that's a big walking destination for our children. A lot of them will leave directly from our school and go directly over there."

For the most part, however, when asked about how their neighborhood environment influenced their experience of walking, focus group and survey respondents described the physical environment from a deficit perspective. The issue of maintenance was a major issue in terms of shrubs and weeds, as well as the presence of trash and graffiti. Many comments related to the ability of residents to keep up their property: "These fences fall down so quickly and they look horrible…and the Bermuda grass and weeds." Maintenance on efforts to upgrade public property was also an issue: "There's a walking path. But you can't see it because of all the weeds. Nobody kept up the plants. Nobody kept up the bushes, trimmed them back." However, one focus group member recognized the economic challenges to ongoing maintenance:

> "Most people in our neighborhood, that's not the priority, but making sure that they have enough at the end of the week, to make sure that they got what they need to do. The houses that are well-maintained are these generational houses that have been in the community forever or people who have a little bit more that they can invest in the infrastructure."

Traffic was a second major impediment to walking, expressed mostly in terms of safety due to the speed of cars, difficulty crossing busy roads, and the need for more traffic enforcement. Noise and pollution were a deterrent. Intercept survey respondents in one neighborhood expressed satisfaction with the number of bus stops, but the reliance of residents on the public transportation system was evident in their desire for more and cleaner, well-maintained and well-lighted bus stops.

The state of sidewalks was another common issue regarding infrastructural improvements, not only in terms of the desire for more sidewalks and crosswalks, but also with respect to their current condition and connectivity.

> "The other factor is that there's missing pieces, there's missing links- like if I wanted to walk to the *carniceria* (meat market), to the corner, there's not really any

good way that has safe sidewalks. The places that might be destinations are hard to get to."

Neighbors also expressed the desire for walking amenities such as public spaces, benches and water fountains. Respondents emphasized the importance of trees, but again recognized the improvement as a potential challenge:

"I don't think we have enough shade. I think it would be nice if we had more shade trees. But then you've got the issue about the water. Utilities are expensive for some families."

3.1.2 Social environment

While not solicited directly through the questions, references to the social environment were extensive in the focus groups and surveys. Personal security was the foremost negative attribute of the social environment that discouraged respondents from walking. While many people differentiated between daytime and nighttime walking, a large number of residents were discouraged by perceptions of high rates of drug-related crime and stories of people being robbed.

"We don't have trust; we don't feel safe due to everything that happens. We've lived in this house for 50 years. We used to sit out here but not anymore, we stay inside more."

Feelings of personal insecurity were largely related to the presence of transients or people from outside the community. One focus group member explained it this way:

"We have a lot of agencies that deal with homeless people and addicts and stuff like that—so they walk… you know, they go into the yards or whatever—people, strangers. A lot of people are afraid. They don't know who people are."

Many people owned dogs to increase their sense of security. The dogs then had a negative impact on a walk through the neighborhood, as described by one resident:

"A lot of them just bark at the fence. There's a few households that people forget to close the driveway gate, then I have to get through this danger zone of dogs. We've never been bitten…but there's a few aggressive dogs that we have to throw a rock at."

Negative perceptions of the social environment were balanced by clearly articulated descriptions of social connectedness within all five neighborhoods. The most frequently mentioned attribute of the neighborhoods was the presence of youth and children.

"This street is a lot more friendly because we have a lot of kids on it and the *niñas (*girls) and the *niños* (boys) that live over here and they collaborate down the street and that's what I think makes it inspiring."

Focus group participants also credited children as the residents most likely to use the streets for walking:

"The kids are remarkable; kids are the walkers. The adults are not the walkers. And the kids are remarkably resilient. And they are the ones at very young ages who are

walking to school. I got kindergarteners who walk from the neighborhood to the school."

While the presence of children was important to the social fabric of the neighborhoods, reference to the generations of family underscored their historical nature. The conversation below was typical in the focus groups in which participants pointed out who lived in the houses.

"There was a house that belonged to my uncle right here in this area. And then they knocked it down and then made this into a garden.

'Yeah because this was a lot and our lot over here.'

'And this was my uncles' over there and this was my other uncle and my aunt (pointing to nearby lots) and they were just, my *nino* (godfather), my *tata* (grandfather)."

Many residents told stories about walking in their neighborhood as children. Asked what she liked about walking in her neighborhood, a survey respondent stated:

"I know a lot of people and have lived here all my life. My mom used to walk me to school when I was a little girl here."

One focus group participant related a childhood story of riding her horse from one neighborhood to another through the city's *arroyos* (washes), some of which still exist and others long encased in concrete. This familiarity with the land extended to the social history of businesses in the neighborhoods. Participants referred to the generations of family-owned businesses and others that had changed from one kind of business to another.

Regardless of the years lived in the neighborhood, social interaction was a strong component of neighborhood attachment, described as "people out and about" and "a people presence". Participants made comments about walking such as, "it's great to communicate while you're walking", "kids yell at me as they pass (the house)", and "things are always happening". One resident pointed out in a focus group that walking could also lead to more social interaction and cohesion: "You get to know your neighbors and for me that's really important. I walk my children to school and because of that I like it and it's been years now that I just walk everywhere."

Social interaction was also expressed as a sense of social cohesion that appeared to mitigate negative feelings of personal insecurity. Many respondents said that people in the neighborhood "look out for each other," or stated that they themselves watch over the neighborhood and the kids. In addition, social cohesion was expressed as people helping each other when they are in need, although few examples of this related directly to walking. However, several focus group members referred to their efforts to beautify the neighborhood, cleaning trash or pruning their neighbors' thorny trees so that children could avoid hitting them.

While social interaction was viewed as a positive in terms of walking in the neighborhoods, there was also a sense expressed by several long-time residents that there is less social interaction in their neighborhoods today than in previous times.

> "Because of mobility people are able to do their own thing. When I grew up it was a very close knit neighborhood. I knew everybody. Everybody's parents. Everybody knew each other. But now people, just my personal opinion, are more on their own. You might know your immediate neighbors but you don't have too much time, too much contact."

A resident of a different neighborhood made a connection back to the important role of children in fostering social interaction when she lamented: "I know all my neighbors but I don't see them as much as now as when the kids were little and they all played together." Residents also made connections between how the built environment impacted social interactions such as the construction of walls that made it impossible to talk over the fence.

Discussion

Our findings demonstrate the importance of integrating both social and physical influences as a key component of efforts to improve neighborhood walkability. The five neighborhoods that were the focus of this exploratory investigation are located in historical areas of Tucson, which, along with other regions of the Southwest, were part of Mexico until the Gadsden Purchase in 1854. As in many regions of the U.S., this singular history underscores the importance of addressing neighborhoods with an understanding of the cultural dynamics in play. Our study applied an active living rationale in engaging residents in creative examination of their neighborhoods that allowed these social and structural characteristics to emerge. While not representative of other neighborhoods, this process of identifying sociocultural influences on perceptions of walkability is relevant to integrated public health and planning efforts to increase active living.

Respondents differentiated between physical and social attributes when assessing the neighborhood walkability. As summarized Table 3, physical attributes were more salient to residents when describing what discouraged them from walking. Participants were uniform in their criticisms, and while the need for infrastructure such as sidewalks, lighting, and crosswalks were frequently mentioned, issues of upkeep and maintenance were also major deterrents. Displeasing aesthetics due to maintenance and litter of both public and private property were common themes, as were the negative effects of traffic in terms of perceptions of comfort and safety. The repeated mention of loose, loud, or aggressive dogs as a deterrent to walking adds nuance to a growing literature on dogs and walking. While some researchers have found similar concerns about dogs, particularly in the context of Latino neighborhoods and from the perspective of women and children (Evensen et al., 2008; Grzywacz et al., 2014), much of this literature has focused on dog ownership as a driver of walking and physical activity (Christian et al., 2017; Ham & Epping, 2006; Sehatzadeh et al, 2011). Our findings suggest that differences in the influence of dogs on walking and physical activity across socioeconomic contexts would add to this growing body of research.

As seen in other urban studies, the presence and convenience of destinations was one positive physical aspect of the environment (Ding et al., 2011; Ewing et al., 2016). Perceptions of the existing social environment appeared more positive than the physical environment in encouraging individuals to walk in these relatively resource-poor

neighborhoods. Overall sociability of the neighborhood, nearby family, familiarity between neighbors, and a sense of social activity all contributed to a positive assessment of walkability and expressed desire to walk. Because of the historic nature of these neighborhoods, the physical structure also had positive social significance. Numerous long-time residents expressed their emotional attachment to the buildings and the landscape.

Research implications

Our study suggests that social connectedness or cohesion related to shared history and culture in Mexican American neighborhoods may contribute to more positive perceptions of neighborhood walkability. To the extent that this is the case, further investigation could explore how favorable social orientation is tied directly or indirectly to walking behavior. A recent study of low-income urban mothers suggests that framing walking as a means to meet social needs may increase walking acceptability (Segar et al. 2016). Studies on social capital may offer a glimpse into how relationships between neighborhood residents are relevant to perceptions of walkability. While this study did not directly investigate social capital, results demonstrate that constructs such as social ties, social cohesion and social organization are influential in decisions to walk. Other studies have shown that neighbors use social capital to address environmental characteristics related to walking. One study found that high and low income neighborhoods used social capital in different ways; residents of low income neighborhoods worked collectively to address vandalism and crime, while in high income neighborhoods residents sought to make what they considered aesthetic improvements to the built environment (Altschuler et al., 2004). Notably, the socioeconomic status of the neighborhood was more important than ethnicity in predicting these efforts. Another study found that social ties had a buffering role against the fear and mistrust associated with perceptions of neighborhood disorder (Ross & Jang, 2000), an issue that emerged in our study as a deterrent to walking. However, we found no studies that focused on harnessing social capital with the intention of improving the safety or comfort of the walking environment specifically.

While not generalizable, our findings may have implications for future research on understanding walking and walkability through social-ecological frameworks. Our findings point to important interactions between the built environment and sociocultural and socioeconomic characteristics. For example, more than half of the participants in our study did not have access to a car, rendering accessibility largely irrelevant in the decision to walk. With regard to personal safety, participants expressed considerable concern and fear about crime that discouraged them from walking in their neighborhoods. However, it appeared that positive social interaction and sociocultural identify among residents was at least as important in forming perceptions about the walking environment and contributing to overall physical and emotional health outcomes. Additional research among individuals who walk out of necessity rather than choice and incorporating social relationships as a counterbalance to perceptions of personal security in the decision to walk could help researchers better understand and operationalize social-ecological models, such as those of Alfonzo (2005) and Sallis et al., (2008).

Planning and policy implications

A key finding from our conversations with residents was that there are important interactions between characteristics of the social, built, natural, and policy environments, as laid out in Sallis et al.'s ecological model of active living (2008). Several residents observed that challenges related to hot desert climate of Arizona are difficult to address in a low-income area because the cost of watering and maintaining trees may be a burden for some families. The issue was further complicated because, despite the clear public benefit of shade trees, current policies require property owners to water and maintain street trees, even if they planted by the city. These complex interactions emerged in other ways, such as the desire for security that resulted in the erection of walls that impede social interaction, use of canine security systems that deter walking, and general recognition that the economic realities of neighborhood residents made general upkeep and maintenance challenging. Additionally, a large share of residents in our study lacked access to a car, likely for economic reasons, making the condition of the walking environment more about the quality and safety of the experience rather than about the choice to walk.

In neighborhoods where residents are more likely to walk, the importance of traffic safety is paramount. Pedestrian safety and traffic calming techniques, while relatively cost effective, are generally secondary to investments in roadway improvements benefiting drivers. When cities do invest in neighborhood walking infrastructure, it is imperative that residents view these investments as positive. Planning decisions that are insensitive to the character and history of neighborhoods and do not actively involve residents may undermine the positive effects of social relationships by negatively impacting neighborhood identity or be directly harmful in terms of gentrification. Many of the comments in our study suggest that city investment in active and ongoing maintenance to existing landscaping and infrastructure would significantly counteract negative perceptions of the physical environment.

At least as important as understanding how policy can address these myriad social and built environment barriers to walking, is how cities can recognize and leverage sociocultural assets of urban neighborhoods. Small investments by the city could support and build on existing neighborhood strengths. The concept of open streets events designed to foster social integration and social norms around physical activity have been shown to encourage social interactions and social cohesion (Engelberg et al., 2014). Channeling resources for these events to neighborhoods with a large proportion of residents who lack access to a car could improve perceptions of walkability among those who walk for transportation (McDonald, 2007). Safe Routes to School (SRTS) is a national initiative to increase physical activity in the U.S that has successfully cut across policy, built, sociocultural, and individual environments. In addition to increasing safety and connectivity of walking environments, SRTS has recognized the important role of social cohesion in supporting walking. These and other programs to encourage active transportation have demonstrated effectiveness encouraging neighborhood residents to walk and be physically active (Bamberg et al., 2011).

Our findings also suggest that efforts to improve neighborhood walkability should move past the traditional built environment focus to identify and leverage sociocultural attributes and socioeconomic context that, in our study neighborhoods, appear to factor significantly into perceptions of neighborhood walkability. Translating this into practice requires collaboration

across silos, disciplines, and sectors. One of our study neighborhoods provides an example of how cross-disciplinary, cross-sectoral strategies can leverage sociocultural strengths of a neighborhood to make lasting walkability improvments. The non-profit community partner on our project leveraged the walk-and-talk focus group in one study neighborhood to build a relationship with the neighborhood elementary school and launch an SRTS initiative that included well-attended community walks, community bike rides, and a block party. They subsequently worked collaboratively with the neighborhood, the school and city planning and engineering staff to secure a small foundation grant to create walkability enhancements near the school that reflected the social and cultural identity and history of the neighborhood.

Limitations

Limitations to this qualitative study include that fact that there were only two participants in one of the focus groups, somewhat compromising the method. One option was to remove this focus group from the data set. However, these two participants shared their experiential perceptions of walkability that were relevant to our research question. A second limitation may be the choice to combine the intercept survey and focus group data. Although these data reflect two distinct methods, we designed the intercept survey based on initial analysis of the focus group data, which allowed us intentionally to explore similar themes. We made an effort in the manuscript to clarify the source of the quotes to demonstrate that our findings emerged across both methods.

Additionally, in our conversations with participants, we did not differentiate between different types of walking in our questions, so we have limited ability to parse for differences between recreational and utilitarian walking. However, participants' observations and perceptions about neighborhood walkability did not seem to vary depending on whether someone was talking about walking for exercise or to the store. Finally, while it was not within the scope to be representative of any particular population, the results of our exploratory study merit further investigation of sociocultural perspectives of walkability.

Conclusion

In this study, we describe a process for identifying attributes of neighborhood walkability through conversations with residents and other users of the neighborhood walking environment. Key to the research process was the involvement of a local non-profit organization with strong community ties and a commitment to improving conditions for biking, walking and transit options across the city. Our findings highlight the importance of understanding complex and interacting contextual factors in order to develop policies and other strategies that better serve community specific needs on multiple levels. Most importantly, we highlight the importance of sociocultural assets within a community as an important, though often overlooked, element of walkability. Our findings suggest that engaging neighborhoods in broad conversations about their neighborhood walking environments will reveal strategies that reflect important sociocultural context and better serve the needs of residents.

Acknowledgments

Literature cited

Adkins A, Dill J, Luhr G, & Neal M (2012). Unpacking walkability: Testing the influence of urban design features on perceptions of walking environment attractiveness. J Urban Des, 17(4), 499–510.

Adkins A, Makarewicz C, Scanze M, Ingram M, & Luhr G (2017). Contextualizing walkability: differences in built environment associations with walking and physical activity across socioeconomic contexts. J Am Plan Assoc 83(103), 1–18.

Alfonzo MA (2005). To walk of not to walk: The hierarchy of walking needs. Environ Behav 37(6), 808–836.

Altschuler A, Somkin CP, & Adler NE (2004). Local services and amenities, neighborhood social capital, and health. Soc Sci Med, 59(6), 1219–1229. doi:10.1016/j.socscimed.2004.01.008 [PubMed: 15210093]

Arvidsson D, Kawakami N, Ohlsson H, & Sundquist K (2012). Physical activity and concordance between objective and perceived walkability. Med Sci Sports Exerc, 44(2), 280–287. doi:10.1249/MSS.0b013e31822a9289 [PubMed: 21716148]

Aytur SA, Rodriguez DA, Evenson KR, Catellier DJ, & Rosamond WD (2008). The sociodemographics of land use planning: Relationships to physical activity, accessibility, and equity. Health Place, 14(3), 367–385. doi:10.1016/j.healthplace.2007.08.004 [PubMed: 17890137]

Bamberg S, Fjuii S, Friman M, & Gärling T (2011). Behaviour theory and soft transport policy measures. Transport Policy, 18(1), 228–235.

Berrigan D, D C, & Fulton J (2012). Vital signs: walking among adults — United States, 2005 and 2010. MMWR., 6(31), 595–601.

Blacksher E, & Lovasi GS (2012). Place-focused physical activity research, human agency, and social justice in public health: taking agency seriously in studies of the built environment. Health Place, 18(2), 172–179. doi:10.1016/j.healthplace.2011.08.019 [PubMed: 21940195]

Brownson RC, Hoehner CM, Day K, Forsyth A, & Sallis JF (2009). Measuring the built environment for physical activity: state of the science. Am J Prev Med, 36(4 Supple), 299–123.

Carpiano RM (2006). Toward a neighborhood resource-based theory of social capital for health: can Bourdieu and sociology help? Soc Sci Med, 62(1), 165–175. [PubMed: 15992978]

Christian HE, McCormack GR, Evenson KR, & Maitland C (2017). Dog Walking In Walking: Connecting Sustainable Transport with Health (pp. 113–135). Emerald Publishing Limited.

Cramm JM, van Dijk HM, & Nieboer AP (2013). The importance of neighborhood social cohesion and social capital for the well being of older adults in the community. Gerontol, 53(1), 142–152. doi:10.1093/geront/gns052

Cutts BB, Darby KJ, Boone CG, & Brewis A (2009). An integrated analysis of physical and social barriers to walkable streets and park access. Soc Sci Med, 69(9), 1314–1322. doi:10.1016/j.socscimed.2009.08.020 [PubMed: 19751959]

Day K (2006). Active living and social justice - Planning for physical activity in low-income, black and Latino communities. J Am Plan Assoc, 72(1), 88–99. doi:Doi 10.1080/01944360608976726

Ding D, Sallis JF, Kerr J, Lee S, & Rosenberg DE (2011). Neighborhood environment and physical activity among youth a review. Am J Prev Med, 41(4), 442–455. doi:10.1016/j.amepre.2011.06.036 [PubMed: 21961474]

Dyck DV, Cardon G, Deforche B, & De Bourdeaudhuij I (2011). Do adults like living in high-walkable neighborhoods? Associations of walkability parameters with neighborhood satisfaction and possible mediators. Health Place, 17(4), 971–977. [PubMed: 21570333]

Engelberg JK, Carlson JA, Black ML, S R, & Sallis JF (2014). Ciclovía participation and impacts in San Diego, CA: the first CicloSDias. Prev Med, 69(Suppl 1), 566–573.

Eschbach K, Ostir GV, Patel KV, Markides KS, & Goodwin JS (2004). Neighborhood context and mortality among older Mexican Americans: is there a barrio advantage? Am J Public Health, 94(10), 1807–1812. [PubMed: 15451754]

Ewing R, Hajrasouliha A, Neckerman KM, Purciel-Hill M, & Greene W (2016). Streetscape Features Related to Pedestrian Activity. J Plan Educ Res, 36(1), 5–15. doi:10.1177/0739456x15591585

Frank LD, Sallis JF, Conway TL, Chapman JE, Saelens BE, & Bachman W (2006). Many Pathways from Land Use to Health: Associations between Neighborhood Walkability and Active Transportation, Body Mass Index, and Air Quality. J Am Plan Assoc, 72(1), 75–87. doi.org/10.1080/01944360608976725

Frohlich KL, & Potvin L (2008). The inequality paradox: The population approach and vulnerable populations. Am J Public Health, 98(2), 216–221. doi:10.2105/AJPH.2007.114777 [PubMed: 18172133]

Fullilove MT (2001). Root shock: The consequences of African American dispossession. J Urban Health, 78(1), 72–80. doi:10.1093/jurban/78.1.72 [PubMed: 11368205]

Gebel K, Bauman AE, Sugiyama T, & Owen N (2011). Mismatch between perceived and objectively assessed neighborhood walkability attributes: Prospective relationships with walking and weight gain. Health Place, 17(2), 519–524. doi:10.1016/j.healthplace.2010.12.008 [PubMed: 21233002]

Giles-Corti B, Vernez-Moudon A, Reis R, Turrell G, Dannenberg AL, Badland H, … Owen N (2016). City planning and population health: a global challenge. The Lancet, 388(10062), 2912–2924. doi.org/10.1016/S0140-6736(16)30066-6

Gordon-Larsen P, Nelson MC, Page P, & Popkin BM (2006). Inequality in the built environment underlies key health disparities in physical activity and obesity. Pediatrics, 117(2), 417–424. doi:10.1542/peds.2005-0058 [PubMed: 16452361]

Grzywacz JG, Suerken CK, Zapata Roblyer MI, Trejo G, Arcury TA, Ip EH, … Quandt SA (2014). Physical Activity of Preschool-Aged Latino Children in Farmworker Families. Am J Health Behav, 38(5), 717–725. 10.5993/AJHB.38.5.9 [PubMed: 24933141]

Koohsari MJ, Badland H, Sugiyama T, Mavoa S, Christian H, & Giles-Corti B (2015). Mismatch between Perceived and Objectively Measured Land Use Mix and Street Connectivity: Associations with Neighborhood Walking. J Urban Health, 92(2), 242–252. doi:10.1007/s11524-014-9928-x [PubMed: 25539783]

Lee IM, & Skerret PJ (2001). Physical activity and all-cause mortality: what is thedose-response relation? Med Sci Sports Exerc, 33(6 Supple), S459–S471. [PubMed: 11427772]

McCormack GR, & Shiell A (2011). In search of causality: a systematic review of the relationship between the built environment and physical activity among adults. Int J Behav Nutr Phys Act, 8(125), 1–11. doi:Artn 12510.1186/1479-5868-8-125 [PubMed: 21194492]

McDonald NC (2007). Travel and the social environment: Evidence from Alameda County, California. Transportation Research Part D: Transport and Environment, 12(1), 53–63.

Onwuegbuzie AJ, & Teddlie C (2003). A framework for analyzing data in mixed methods resrarch Tashakkori A & Teddlie C (Eds.), Handbook of mixed methods in social and behavioral research (pp. 351–383).

Otero LR (2010). La Calle: spatial conflicts and urban renewal in a southwest city: University of Arizona Press.

Patton M (2002). Qualitative Research and Evaluation Methods. Thousand Oaks: Sage.

Powell LM, Slater S, Chaloupa FJ, & Harper D (2006). Availability of physical activity-related facilities and neighborhood demographic and socioeconomic characteristics: A national study. Am J Public Health, 96(1676-1680), 1676–1680. doi:10.2105/AJPH.2005.065573 [PubMed: 16873753]

Riggs W, & Steiner RL (2017). The Built Environment and Walking In Walking: Connecting Sustainable Transport with Health (pp. 139–165). Emerald Publishing Limited.

Ross CE, & Jang SJ (2000). Neighborhood disorder, fear, and mistrust: the buffering role of social ties with neighbors. Am J Community Psychol, 28(4), 401–420. [PubMed: 10965384]

Sallis JF, Bull F, Burdett R, Frank LD, Griffiths P, Giles-Corti B, & Stevenson M (2016). Use of science to guide city planning policy and practice: how to achieve healthy and sustainable future cities. The Lancet, 388(10062), 2936–2947. doi.org/10.1016/S0140-6736(16)30068-X

Sallis JF (2009). Measuring physical activity environments: a brief history. Am J Prev Med, 36(4 Suppl), S86–92. doi:10.1016/j.amepre.2009.01.002 [PubMed: 19285214]

Sallis JF, Cervero RB, Ascher W, Henderson KA, Kraft MK, & Kerr J (2006). An ecological approach to creating active living communities. Annu Rev Public Health, 27, 297–322. doi:10.1146/annurev.publhealth.27.021405.102100 [PubMed: 16533119]

Sallis JF, Owen N, & Fisher EB (2008). Ecological models of health behaviour In Rimer GK,BK, & Viswanath K (Eds.), Health behaviour and health education: Theory Research and Practice. 4th Edition (pp. 465–485.): Wiley & Sons Inc.

Segar ML, Heinrich KL, Zieff SG, Lyn R, Gustat J, Tomplkins NO, Perry CK, Umstattd Meyer MR, Bornstein D, Manteiga A, Eyler AA (2017) What walking means to moms: Insights from a national sample to frame walking in compelling ways to low-income urban mothers. J Transport & Health. 5, 5–15.

Sehatzadeh B, Noland RB, & Weiner MD (2011). Walking frequency, cars, dogs, and the built environment. Transportation Research Part A: Policy and Practice, 45(8), 741–754. doi.org/10.1016/j.tra.2011.06.001

Shavitt S, Cho YI, Johnson TP, Jiang D, Holbrook A, & Stavrakantonaki M (2016). Culture Moderates the Relation Between Perceived Stress, Social Support, and Mental and Physical Health. Journal of Cross-Cultural Psychology, 47(7), 956–980. doi:10.1177/0022022116656132

Weiss CC, Purciel M, Bader M, Quinn JW, Lovasi G, Neckerman KM, & Rundle AG (2011). Reconsidering access: park facilities and neighborhood disamenities in New York City. J Urban Health, 88(2), 297–310. doi:10.1007/s11524-011-9551-z [PubMed: 21360245]

Wolch J, Wilson JP, & Fehrenbach J (2005). Parks and park funding in Los Angeles: An equity mapping analysis. http://college.usc.edu/geography/ESPE/documents/publications_USC_parks.pdf (accessed 17.05.05).

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 1

Neighborhood Composition based on U.S. Census Data (2010)

Neighborhood	Population*	Land area sq. mile*	Hispanic Latino*
1	6,213	2.6	72%
2	13,984	3	76%
3	5,918	1.3	72%
4	14,929	4.3	89%
5	2,900	.6	88%

Table 2

Characteristics of Participants by Neighborhood N=138

Neighborhood	Focus Group	Intercept Survey	Total Participants	Female	Hispanic/Latino
1	6	-	**6**	5	4
2	8	14	**22**	19	14
3	2	44	**46**	16	32
4	4	26	**30**	16	28
5	-	34	**34**	15	30
	20 (15%)	118 (85%)	**138 (100%)**	71(51%)	108 (78%)

Table 3

Perceptions of the physical and social environments related to walking

Association with walkability	Physical environment		Social environment	
	Theme	Sub themes	Theme	Sub themes
Positive	*Public space*	Parks Community garden River walk	*Children*	Positive presence Youth-centered destinations
	Destinations	Good food Convenience to shops	*Social Interaction*	Positive social atmosphere People know each other
	Desired improvements	Common areas Water fountains/benches Lights Sidewalks/crossings	*Social History*	Family lives here Grew up in the neighborhood History of places/buildings
			Social Cohesion	People look out for each other (security) People help each other
Negative	*Maintenance*	Trash and Litter Overgrown shrubbery Abandoned houses/lots	*Personal Security*	Crime Outsiders/homeless Dogs
	Sidewalks	Broken, uneven sidewalks Poorly marked crosswalks		
	Traffic	Pollution Speeding Increasing traffic		
	Trees	Not enough shade Maintenance for trees		
	Bus stops	Insufficient routes Poorly maintained stops Security around bus stops		