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Developing, Testing, and Deploying a Toolkit for Collecting Qualitative Pedestrian Environments Data (QPED)

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REDEFINING PLANNING METHODS AND MEASURES FOR DISADVANTAGED POPULATIONS:

Developing, Testing, and Deploying a Toolkit for Collecting Qualitative Pedestrian Environments Data (QPED)

Final Report

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16. Abstract

Traditional walkability metrics often overlook important differences across socioeconomic and sociocultural contexts. The Qualitative Pedestrian Environments Data (QPED) toolkit was developed to address these limitations. This toolkit, created through an iterative, community-informed process, includes materials and protocols for data collection, entry, coding, and analysis. Initial data collection in predominantly Mexican-American neighborhoods in Tucson highlighted the importance of social environment factors such as community identity and social networks. The research team used QPED to conduct 706 on-street intercept interviews, capturing nuanced perspectives and achieving response rates between 50% and 70%. Key findings revealed significant differences in perceptions of walkability between Hispanic/Latino and white non-Hispanic neighborhoods, emphasizing social interactions and community identity in the former and physical infrastructure in the latter. The cost-effective QPED toolkit, successfully deployed across multiple cities, offers valuable insights into pedestrian environments and is publicly available online. This toolkit helps provide a more nuanced understanding of pedestrian environments than current data collection instruments and, in the case of our research, highlights the importance of social factors.

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exEcutive Summary

Walking is a fundamental mode of transport and a common form of physical activity linked to lower rates of obesity, cardiovascular disease, and premature death. Understanding the factors that facilitate or deter walking has led to extensive research across urban planning, transportation, and public health disciplines. This report presents the development and testing of a method combining intercept surveys and qualitative research to facilitate brief on-street conversations about walking and walkability.

This research, conducted in collaboration between University of Arizona's urban planning and public health faculty and students, builds on preliminary findings from a study funded by the Centers for Disease Control and Prevention (CDC). The earlier study highlighted the importance of understanding walkability across different socioeconomic and sociocultural contexts. A systematic review of walkability literature revealed that walkable environments have a stronger positive effect on advantaged groups compared to disadvantaged groups. This discrepancy is attributed to various unmeasured social and environmental factors, biased measurement, and differences in family or work characteristics.

Standard walkability metrics often overlook these socioeconomic and sociocultural differences. Early studies primarily focused on reducing vehicle miles in predominantly white, middle, or upper-class neighborhoods, thereby limiting insights into socioeconomic differences. Measurement tools, such as GIS, environmental audits, and surveys, also often fail to capture nuanced social environment characteristics and are biased towards physical elements of the environment.

The Qualitative Pedestrian Environments Data (QPED) toolkit was developed through an iterative, community-informed process. The toolkit includes materials and protocols for data collection, data entry, coding, and analysis, and was refined through pilot studies and community engagement. Initial data collection involved walking focus groups in predominantly Mexican-American neighborhoods in Tucson, which highlighted the importance of social environment factors such as community identity and social networks, and the need to reach a broader cross section of the walking public.

To capture more diverse perspectives, the research team developed and piloted on-street intercept interviews. These brief, open-ended interviews aimed to understand pedestrian perceptions of walkability in real time. The final interview guide included a mix of open-ended and closed-ended questions, capturing detailed insights while maintaining a reasonable response burden. The tool was deployed across multiple jurisdictions, including Tucson, Los Angeles, Orange County, and Denver, achieving response rates between 50% and 70%.

Key findings:

- **Socioeconomic and Sociocultural Differences:** Hispanic/Latino neighborhoods often highlighted social interactions, community identity, and utilitarian walking trips, while white non-Hispanic neighborhoods focused more on physical infrastructure and aesthetics.

- **Positive Social Environment:** In Hispanic/Latino neighborhoods, positive social environment elements such as rich history, culture, and family roots were significant contributors to perceived walkability.
- **Cost Effectiveness:** The on-street interview method proved cost effective, with costs remaining under $5 per completed interview, significantly lower than traditional mail or phone surveys.

The QPED toolkit has been successfully deployed across multiple cities, providing valuable insights into pedestrian environments. The toolkit is publicly available online and has garnered interest from various organizations and researchers. The final phase of this research included developing a mail survey and conducting a systematic review of survey instruments measuring social aspects of walking environments. The systematic review identified gaps in existing tools, emphasizing the need for updated instruments that reflect the complex role of social environmental factors, particularly for diverse communities.

The QPED toolkit represents a significant advancement in understanding walkability across different contexts. By combining intercept surveys with qualitative research, this method provides a nuanced understanding of pedestrian environments, highlighting the importance of social factors. The toolkit is a valuable resource for researchers, practitioners, and community organizations aiming to improve community walkability across socioeconomic and sociocultural contexts.

For further details and access to the QPED toolkit, please visit QPED.org.

1.0   INTRODUCTION

Walking is a fundamental mode of transport that facilitates access to the places and things people need to live their lives, including employment, services, social networks, and other transportation modes like public transit. Walking is also one of the most common forms of physical activity for many adults (Hovell et al., 1989; Lee et al., 2008) and is linked to lower rates of obesity, cardiovascular disease, and premature death (Hardman and[1] Stensel, 2009; Patel et al., 2018; Mah et al., 2020). The role of walking and physical activity in chronic disease prevention has led to efforts across multiple disciplines to better understand the various attributes of individual, household, and physical and social environmental characteristics that facilitate or deter walking (Sallis et al., 2006). Hundreds of studies from the fields of urban planning, transportation, and public health have investigated this question by examining relationships between environmental attributes, or perceptions of them, and behavior or health outcomes. The purpose of this paper is to present the testing and development of a method that combines the efficiency of intercept surveys with the open-ended, exploratory nature of interview-based qualitative research to facilitate brief on-street conversations about walking and walkability.

This present research project was a collaboration between researchers in urban planning and public health at the University of Arizona. Our overarching aim was to examine standard walkability metrics and assumptions about pedestrian perceptions of walkable places to understand how a concept like walkability holds up across socioeconomic and sociocultural contexts.

1.1   REPORT ORGANIZATION

This was a multiyear, multifaceted, COVID-interrupted project that resulted in the QPED toolkit, two workshops at national conferences, a mail survey (never deployed due to COVID), three peer-reviewed papers, and multiple conference presentations. The report begins with a review of the literature clarifying why it was necessary to take a step back from standard metrics and assumptions about walkability. It then proceeds into an overview of the development, testing, and refinement of the QPED tool, its deployment across three states, and our research findings. The report then summarizes the research team's efforts to package and publicize the method into a downloadable, modifiable tool for use by researchers, practitioners, and community organizations. Lastly, the report goes over the development of a mail-based survey that was intended to complement the QPED toolkit. The survey was developed but never deployed due to the COVID-19 pandemic. Our review of existing survey instruments resulted in a systematic review of how researchers have asked about social attributes of walking environments, which became a stand-alone journal article in *Health and Place* (Iroz-Elardo et al., 2021).

1.2   FOUNDATIONAL WORK FROM RESEARCH TEAM

This work builds on preliminary findings from an earlier study conducted by the research team and funded by the CDC. In that study, we conducted a systematic review of the walkability literature (Adkins et al., 2017) and developed a method for using walking focus groups to better understand resident perceptions and conceptions of walkability using prompts for their neighborhood walking environment (Ingram et al., 2017).

Our systematic review of walkability research found that many early studies of the relationship between built environments and walking and/or physical activity intentionally focused on white middle-class neighborhood contexts or simply controlled for variables such as race/ethnicity and income, rather than exploring the importance of such variables in understanding more nuanced conceptions of walkability (Adkins et al., 2017). In that paper, we identified a subset of these studies that reported enough data to examine differences in the effect of walkable built environments across different groups. We found that across these studies, the effect of a walkable built environment on walking/physical activity was 2.3 times stronger for relatively advantaged groups (by race, income, or educational attainment) than for disadvantaged groups. We identified three primary reasons for these differences:

- Lower than expected rates of walking/physical activity in objectively walkable, socioeconomically disadvantaged areas, perhaps due to family or work characteristics or attributes of the social environment not captured by most standard walkability metrics.

- Higher than expected rates of walking/physical activity in objectively less walkable, socioeconomically disadvantaged areas, perhaps due to individuals and families having fewer transportation choices and needing to walk more out of necessity.

- Biased measurement based on the development and testing of standard walkability metrics largely in white non-Hispanic middle- to upper-income locations.

Our review suggests that the inattention of planning scholars to socioeconomic differences in the effects of the built environment may have led to recommendations for planning practitioners and policymakers that resulted in benefits accruing to some more than others. In some neighborhood contexts, such recommendations may have overstated the benefits of walkable built environments and overlooked the need for strategies beyond built environment interventions.

1.3   FROM WALKING FOCUS GROUPS TO ON-STREET INTERCEPT INTERVIEWS

One aspect of the CDC-funded project that helped lay the foundation for the work summarized in this report was the use of walking focus groups aimed for understanding resident conceptions of walkability in their own words, using prompts from the neighborhood context in which they walk. These focus groups resulted in in-depth

conversations and made clear that myriad factors beyond those most often considered by planners were factoring into resident conceptions of walkability (for more, see Ingram et al., 2017).

A key limitation of these focus groups observed by the research team was that despite our efforts to recruit broadly within the neighborhood, most people who showed up for a multihour walking focus group were mostly those already engaged in neighborhood association and planning-type conversations. After the first focus group, we began on-street recruitment by sending members of the research team into places where people were walking and handing out invitations. This approach did not yield many participants. However, at our fourth and final walking focus group, one of the participants was a Latina mother who had been recruited while making a utilitarian walking trip with her two children while her husband had the family vehicle at work. The woman spoke little English (focus groups were conducted bilingually) and had not previously been engaged in neighborhood conversations about walkability or planning. In a pivotal moment for our research, the woman said, in response to a question about what the city could do to make the area a better place for walking, (translated from Spanish): "Come and talk to us. Like you did when you approached me." This prompted the research team to begin discussing ways of doing just that. This was the impetus for the development of our on-street intercept interview protocols that became the basis for the QPED toolkit.

1.4 LIMITATIONS OF STANDARD WALKABILITY METRICS AND MEASUREMENT TOOLS

The role of walking and physical activity in chronic disease prevention has led to efforts across multiple disciplines to better understand the various attributes of individual, household, and physical and social environmental characteristics that facilitate or deter walking (Sallis et al., 2006). Hundreds of studies from the fields of urban planning, transportation, and public health have investigated this question by examining relationships between environmental attributes, or perceptions of them, and behavior or health outcomes.

1.4.1 Bias in standard walkability metrics

Foundational studies of walkable built environment from the 1990s rarely addressed socioeconomic disparities in walking. Two primary reasons for this oversight can be identified. Firstly, researchers aimed to test new urbanist claims that neotraditional designs could reduce vehicle miles traveled for nonwork trips, focusing on environmental issues and congestion caused by sprawl and increased auto use. Early active travel research often compared suburban neighborhoods with or without traditional designs, typically in predominantly White[2] and middle- or upper-class areas, making it difficult to identify differences by income and race (Ewing & Cervero, 2010; Forsyth et al., 2008; Handy, 2005a, 2005b; Bagley & Mokhtarian, 2002; Steiner, 1996). Secondly, the research agenda was influenced by skepticism from travel behaviorists about whether urban form directly influenced travel behavior or if observed associations

were due to socioeconomics and self-selection. Consequently, researchers controlled for socioeconomic factors to highlight the independent effects of the built environment, further limiting opportunities for comparisons by socioeconomic context (Boarnet & Sarmiento, 1998; Cervero & Landis, 1995; Handy, 1996b; Kitamura et al., 1997; Lund, 2003; Moudon et al., 1997).

Second, the design of much of the research agenda was a response to skepticism from travel behaviorists about whether observed associations between urban form and travel behavior were causal or simply artifacts of socioeconomics and self-selection. It is common in the built environment travel behavior literature of the time, as a result, for researchers to control for socioeconomic factors to highlight the independent effects of the built environment (e.g., Boarnet & Sarmiento, 1998; Cervero & Landis, 1995). The strategy of preemptively controlling for socioeconomics by selecting study areas with similar socioeconomic profiles further limited opportunity for comparisons by socioeconomic context (e.g., Handy, 1996b; Kitamura et al., 1997; Lund, 2003; Moudon, Hess, Snyder, & Stanilov, 1997).

Studies conducted in the 1990s rarely address differences in walking by measures of socioeconomic disadvantage, except for some that focus on individual mobility limitations, such as lack of car ownership. There appear to be two reasons for the lack of focus on socioeconomics. First, researchers were primarily interested in testing the claims of new urbanists and others that neotraditional designs could reduce vehicle miles traveled for nonwork trips because their aim was often to address environmental issues and congestion due to sprawl and increasing auto use. Several authors have observed that much of the early active travel research focused on comparing suburban neighborhoods with or without traditional neighborhood designs (Ewing & Cervero, 2010; Forsyth, Hearst, Oakes, & Schmitz, 2008; Handy, 2005a, 2005b). Bagley and Mokhtarian (2002) and Steiner (1996) note that because these areas tended to be White and middle or upper class, identifying differences by income and race was not possible.

1.4.2 Measurement challenges

Recognition of the importance of walkable places has necessitated the creation of dozens of tools to measure attributes of walkable environments. The most common approaches fall into three categories: analysis of secondary data, often using geographic information systems (GIS); environmental audits, typically conducted by trained auditors; and surveys of neighborhood residents. The strength of audits and GIS inventories are in their ability to capture detailed, objective, and place-specific measures of the built environment known to be related to walking. These can be especially useful as they pinpoint physical attributes of a place that transportation planners or engineers might be able to manipulate to improve walkability. Audits are typically conducted by trained observers in order to increase validity of measurement across locations, and auditors are typically brought in from outside a community to allow for unbiased and objective assessments. This means, however, that local context and perspective may be missed. Schlossberg and Brehm (2009) have adapted the audit approach for use by community groups.

Due, in part, to difficulty observing and objectively measuring neighborhood social environment characteristics, most audit-based approaches look almost exclusively at physical elements. Some venture into the realm of the social environment by capturing physical artifacts of social elements such as public gathering spaces, public art, or physical signifiers of gathering (Iroz-Elardo et al., 2021). This approach can be challenging, however, because researchers risk ascribing meaning to their observations in ways that may not match individual or community perspectives. For example, in one audit-based tool the mere presence of public housing was included in an "index of incivilities," with no regard for how the public housing was perceived by the community or individuals (Knapp et al., 2017). Some audits include subjective items. For example, PEDS includes a question asking the auditor to rate overall feelings of safety and comfort on a street (Clifton et al., 2007). A 2012 study by one of this report's authors showed only weak to moderate correlation between auditor ratings and resident ratings of the same street segments (Adkins et al., 2012), indicating that even trained auditors may not be poor proxies for resident or pedestrian perceptions.

Survey-based approaches can overcome limitations of audit-based approaches by capturing user-generated perceptions and exploring more subjective elements of the environment, including both physical and social elements. Additionally, when survey sampling targets a neighborhood rather than just walkers, useful insights about why people do not walk can increase understanding of the barriers those people may face. One limitation of surveys is that instruments are typically closed-ended, such as Likert scales or multiple choice. These types of items can be useful but are generally best suited for questions where existing knowledge gives researchers confidence about both the relevant questions to ask and what responses are likely to be given. By far the most common survey of walkable environments is the Neighborhood Environment Walkability Survey (NEWS) developed by Saelens et al. (2003). NEWS and an abbreviated version, NEWS-A, has been translated into dozens of languages and adapted for use on six continents. Intercept surveys have been used to target specific user groups, such as pedestrians accessing a specific location (Clifton et al., 2012; Piatkowski et al., 2015; Schneider, 2013).

Applying qualitative research methods to walking and walkability research is not new. Lynch (1964) famously incorporated walking interviews into *Image of the City*. Over the last decade, several researchers have incorporated the more novel approach of conducting interviews while walking with respondents to allow elements of the walking environment to prompt discussion. Carpiano (2009) developed a "go-along interview" methodology for understanding public health-related factors of neighborhoods, including elements related to walkability. This approach has been replicated and adapted by additional researchers (Bergeron et al., 2014; Garcia et al., 2012; Porta et al., 2017). More recently, Battista and Manaugh (2018) used a multimethod approach with both sedentary and walking interviews to assess the theoretical framework of walkability.

2.0 DEVELOPMENT AND TESTING OF A TOOLKIT FOR COLLECTING QUALITATIVE PEDESTRIAN ENVIRONMENTS DATA (QPED)

QPED arose from a multiyear research project funded by the Centers for Disease Control and Prevention (CDC) to better understand what walkability means in different socioeconomic and sociocultural contexts. Tool development and initial deployment focused on neighborhoods in Tucson, Arizona, where the research team made comparisons between predominantly Mexican-American neighborhoods and non-Hispanic white neighborhoods with similar objective measures of walkability based on traditional measures.[1] The premise of the project was to take a step back from existing measures of walkability and recognize that many standard measures of walkability used by researchers and practitioners have been developed and validated in relatively white and higher-income settings and might, therefore, be less accurate in other contexts (Adkins et al.). Taking a step back from these established measures required that the research team develop tools to systematically learn from—and in the words of—people walking in the focus neighborhoods.

The QPED Toolkit consists of materials and protocols for data collection, data entry, coding, and analysis as well as training materials. Each piece of the toolkit was developed and refined using an iterative process described in the next section. Materials are publicly available online at qped.org and are intended for use by researchers as well as public health and planning practitioners, community groups, and advocates.

The development of the QPED intercept interview instrument followed an "action research" spiral (see Figure 2.0) of planning how to better understand community needs; implementing a phase of data collection that relies heavily on community observations; and reflecting on the preliminary findings to revise the planned data collection approach to explicitly incorporate the shared understanding between research and community that has occurred with the previous steps (Kemmis et al., 2005). Our approach also fits nicely within the Interview Protocol Refinement Framework proposed by Castillo-Montoya, though this framework was published midway through our refinement process (Castillo-Montoya, 2017). This iterative process of refining the instruments and their implementation was repeated several times, as shown in more detail in Figure 1 and as discussed in depth below. By using a process informed by the action research spiral laid out by Kemmis and McTaggart (2005), we were able to fine-tune the method through a series of actions that can be categorized as "plan/revise," "act/observe," or "reflect." Our tool development process is illustrated in Figure 1, in which each task is categorized using the action spiral framework.
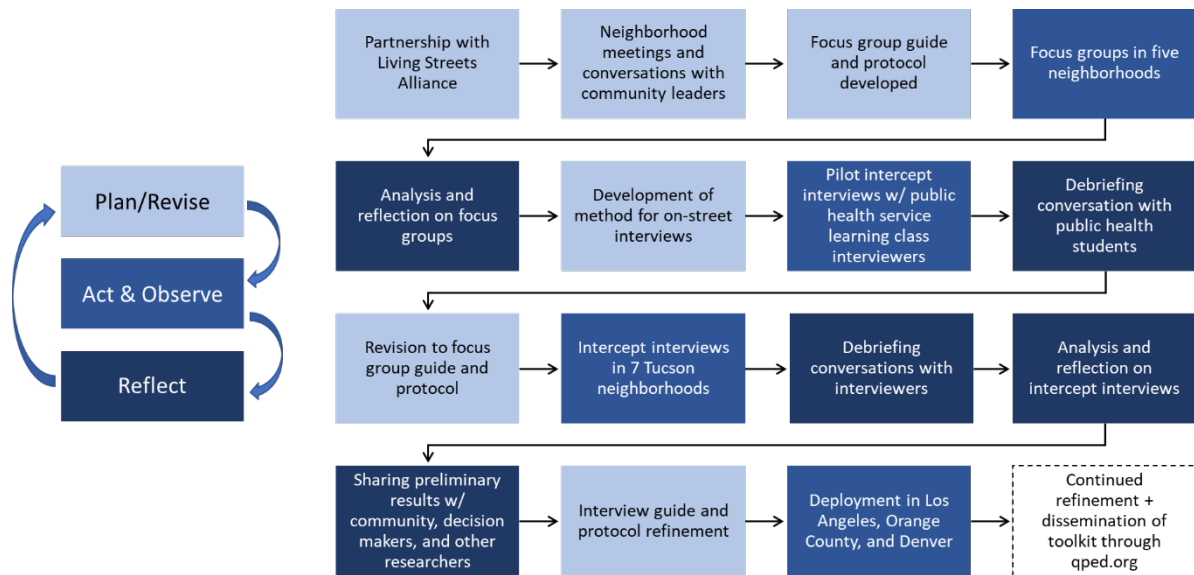
Figure 2.1: Flow chart showing QPED development, testing, and refinement overlaid on Action[3] Research Spiral from Kemmis and McTaggart (2002)

Unlike standard quantitative measures, there are no simple tests for the validity of qualitative, open-ended data collection tools. Instead, we identified five criteria for evaluating the effectiveness of our method. The first two criteria are unique in that they relate to the underlying theoretical and methodological foundations upon which our method was developed. Criteria 3-6 are based on our testing of the tool.

1. The inherent value of interpretivist epistemological traditions and qualitative tools to understand urban phenomena within socioeconomic, sociocultural, and built environment contexts (Fossey et al., 2002; Dandekar, 2005).
2. Our adherence to an iterative, community-informed tool development process based on the Action[4] Research Spiral (Kemmis & McTaggart, 2002).
3. Willingness of pedestrians to talk with interviewers and ability to achieve a reasonable response rate.
4. Ability of on-street interviews to capture enough detail, nuance, and local context to provide actional insight to researchers and decision makers.
5. Cost effectiveness compared to other methods of data collection.
6. Successful deployment in multiple jurisdictions across socioeconomic and sociocultural context to allow for systematic comparison across contexts.

2.1   PARTNERSHIPS AND COMMUNITY ENGAGEMENT

The initial study design and data collection in Tucson was done in partnership with a local non-profit organization, Living Streets Alliance (LSA), which had previously worked with community groups and local residents in our study area on issues related to walking. LSA facilitated initial conversations with neighborhood residents and other community groups as well as elected officials representing identified study

neighborhoods. LSA staff worked with the research team at every phase from research design, tool testing, data collection, and ground-truthing of findings.

2.2 WALKING FOCUS GROUPS

The first data collection effort was a series of four focus groups in 2015 in Tucson to broadly explore the topic of neighborhood walkability with residents of predominantly Mexican-American neighborhoods. The focus groups started around a table at a community center or public space. However, unlike traditional focus groups, the focus group subsequently moved outside where most of the time was spent walking through the neighborhood talking about perceptions of the area as a place for walking. Experiencing elements of the actual neighborhood in real time prompted conversations that would likely not have occurred around a table. This facilitated a deeper understanding by both researchers and community members of barriers and facilitators to walking in each neighborhood context. Many of the issues raised were expected and consistent with previous research findings and professional practice: concerns about dangerous street crossings, high vehicle travel speeds, lack of sidewalks, perceptions about crime, and concerns about lack of lighting (Adkins et al., 2017). We were somewhat surprised, however, by the strong connections many participants made between perceptions of walkability and positive elements of the sociocultural environment. Important social elements that were immediately evident included a deep sense of connection to place, history, and the role of social networks and a sense that neighbors were looking out for each other.

It also became clear following our final focus group that despite many insights into perceptions of walkability in the four neighborhoods, we were not reaching a broad enough cross section of the community. At our final focus group, a woman arrived who had received a flier the day before while walking along a busy stretch of road in one of our study neighborhoods. This community member spoke only Spanish, did not have access to a car, and relied heavily on walking for all her travel, often with her two young children. In response to the final focus group question about what the city could do to make the neighborhood a better place for walking, she said (translated from Spanish): "Come and talk to us. Like you did when you approached me." This comment prompted additional reflection and discussion among the research team about how we could better learn from people who are out using the pedestrian network and who may not be part of the current academic and governmental conversation about supporting walkability.

2.3 ON-STREET INTERCEPT INTERVIEW DEVELOPMENT AND PILOT

The strategy we turned to following the focus groups was to talk to people in the act of walking using brief on-street interviews. Based on our experience with the focus groups taking us beyond standard walkability indicators, we knew we needed to keep the intercept interviews fairly open-ended to allow people to talk about issues, facilitators, and barriers in their own terms. This is an important distinction from most intercept survey methods, which are largely comprised of closed-ended, multiple choice, or predetermined scales (Schneider, 2018). Yet our desire for an open-ended approach

had to be balanced with our needs to keep the interviews brief enough for people to complete on the go and for our interviewers to be able to accurately record what was being said without using audio recorders, which we concluded would be cumbersome and potentially off-putting, particularly in areas with a relatively high likelihood of talking with undocumented residents.

We piloted the on-street interviews as part of a service-learning orientation for University of Arizona Master's of Public Health (MPH) students. About 20 MPH students were trained to conduct interviews and record notes of their conversation, resulting in about 100 pilot interviews. Following pilot data collection, members of the research team were able to debrief with the student interviewers to learn valuable insights about the interview guide and, more generally, about whether this approach would work.

2.4 REFINEMENT OF QPED ON-STREET INTERVIEW GUIDE

Considerable changes were made to the interview guide following the pilot to balance interview burden and focus on key topics. Specifically, several open-ended questions were removed based on feedback that they prompted redundant responses or were too general; some open-ended questions were modified and closed-form rating questions were added to reduce length and burden; additional demographic questions (e.g., age, race/ethnicity, and sex) were included; and an interview language indicator was added. The pilot also helped the research team identify strategies for conducting the interview including starting out very conversationally, being flexible with question order, and confirming that our strategy for note taking rather than audio recording captured sufficient detail.

The final version of the on-street interview guide is made up of open-ended, closed-ended, and demographic questions (see Table 1). There are a total of six open-ended questions. The first two open-ended questions focused on the elements perceived as contributors to or detractors from perceived walkability. The next two asked people for recommendations to make the area better for walking, including what the city should do to improve the area's walking environment. The fifth open-ended question inquired about the types of businesses and services that could increase area walkability. The last question simply asked them to identify the intersection closest to their home.

The seven closed-ended questions included two multiple-choice, one dichotomous, and four Likert Scale questions. The first multiple-choice question inquired about the destination the person was walking to, with possible answers including work, school, and shopping. The second one queried walking frequency per week, with the options to answer every day, a few times a week, about once a week, and less than once a week. The dichotomous question asked whether the person had access to an automobile. The Likert Scale questions asked the individual to rate how good an area was as a place for walking, as well as safety perceptions and business options, with number one being terrible, very unsafe or very unsatisfied and number five being great, very safe or very satisfied, depending on the question. Finally, three demographic questions at the end of the interview documented age, sex, and ethnicity. There was also a box for the interviewer to check whether a conversation was in English or Spanish.

Table 2.1: Intercept interview guide items (English and Spanish)

1. Where are you walking to this morning/afternoon? / *¿Dónde esta caminando esta mañana/tarde?*
2. What are some things you **like** about this area as a place for walking? / *¿A cuáles son las cosas que **le gustan** en esta área para caminar?*
3. What are some things you **do not** like about this area as a place for walking? *¿A cuáles son las cosas que **no le gustan** en esta área para caminar?*
4. Are there any other things that could make this area better for walking? *¿Hay otras cosas que podría mejorar este área para caminar?*
5. What are the most important things you think the city should do to make this area better for walking? *¿Cuáles son las cosas más importantes que la ciudad debe hacer para que esta área sea mejor para caminar?*
6. How often do you walk in this area? / *¿Con qué frecuencia usted camina en esta área?*
7. Do you have (access to) a car? *¿Usted tiene un carro?*
8. How would you rate this area as a place for walking? (1-5 with 5 being best) // *¿Cómo calificaría esta área como un lugar para caminar?*
9. How safe do you feel walking in this area during the day? *¿Qué tan seguro se siente caminar en esta área durante el día?*
10. How safe would you feel walking in this area at night? *¿Qué tan seguro se siente caminar en esta área por la noche?*
11. How satisfied are you with the selection of businesses or services that you can walk to in this area? *¿Está satisfecho con la selección de negocios o servicios de que se puede caminar en esta área?*
12. What other types of businesses or services would make this area better for walking? *¿Qué otros tipos de negocios o servicios haría esta área mejor para caminar?*
13. What is the closest intersection to your home? *¿Cuál es la intersección más cerca de su casa?*

14. What is your age?	15. M or F	16. Race/Ethnicity:	17. Conducted in Span. or Eng:

2.5 RESPONSE RATES AND COST EFFECTIVENESS

Given the decline in response rates across multiple survey types in recent years (Stedman et al., 2019), the cost of achieving viable response rates for mail and phone surveys has increased. In-person interviewing can also be costly, so we wanted to make a rough comparison of cost effectiveness between our method of on-street interviews and mail or phone surveys. We note that an apples-to-apples comparison is of limited use because, unlike with mail or phone surveys, our sampling frame was people walking, and not all residents. Still, the comparison may be useful for researchers and practitioners interested in understanding walking environments from the perspective of those most familiar with them.

First, we looked at response rates for our on-street interviews. Across 21 sites in eight jurisdictions and three states (Arizona, California, and Colorado), we achieved response rates ranging from 50% to 70%. In addition to response rates, we estimated that in

areas with less pedestrian traffic we were able to sample about 80% of people walking in the study area. In busier pedestrian environments, interviewers sampled closer to 10% due to people walking past while interviews were being conducted. Additionally, interviewers were trained to ensure unbiased and random selection of participants regardless of the percentage of pedestrians sampled.

2.6 NUANCE AND DETAIL

Our initial use of on-street interviews (n = 190) revealed a wide array of positive and negative environmental attributes related to walkability. Based on consensus-based thematic coding of interviews, we identified 14 elements related to the physical and social environment that either added to or detracted from respondents' perceived walkability. This allayed our concern that short on-street interviews would elicit superficial and homogenous responses from the sample.

We were also able to explore qualitative and quantitative differences between neighborhoods in our study areas. For example, from our pilot data in Tucson we observed that pedestrians in the white non-Hispanic neighborhoods were more likely to talk about infrastructure as a detractor from walkability and aesthetics (i.e., nice things to look at), and calm and quiet as positive contributors. Conversely, positive elements of the social environment, such as social interaction, sense of community, and social support, were rarely mentioned. In contrast, in Hispanic/Latino neighborhoods in Tucson, people mentioned infrastructure far less frequently and were much more likely to mention elements of the social environment (positive and negative), neighborhood upkeep, and maintenance as a detractor, and the importance of destinations.

Our analysis of interview data also revealed differences in how people talked about various contributors to walkability. For example, in the Tucson data there were differences in how people talked about perceptions of crime, with some talking about specific firsthand experiences and others talking about more general concerns or fears. There were also notable differences in how people talked about the positive elements of the social environment, with a tendency to be far more specific and sometimes quite effusive in how respondents in Tucson's Hispanic/Latino neighborhoods talked about how social interactions and community identity made their neighborhood better for walking. In non-Hispanic white neighborhoods, mentions of social interaction were far less specific. In addition to differences in frequency of mentions, the way people talked about certain characteristics gave us a far deeper understanding of resident conceptions of walkability.

2.7 COST EFFECTIVENESS

Survey by mail and phone costs can easily exceed $15 or $20 per completed survey, and may be higher with lower response rates, complicated stratification, or difficult-to-reach populations (Sinclair et al., 2012). Our interviewers were paid between $15 and $20 per hour and averaged between four and five interviews per hour. Factoring in time for interviewer training, travel time to study sites, data entry time, and costs of printing

and materials, our final costs remained under $5 per completed interview. Having trained volunteers conduct on-street interviews or reallocating time of salaried employees to conduct interviews could translate into even lower cost for on-street interviews.

2.8   DEPLOYMENT ACROSS MULTIPLE CONTEXTS

We also have shown that this protocol can be implemented in multiple cities in its current form. The UA research team applied the tool in Los Angeles and Orange County, while collaboration with the University of Colorado Denver resulted in graduate students conducting survey interviews in multiple neighborhoods across Denver. There is potential for communities across the United States, including with partner universities, to continue researching pedestrian environments with this protocol and increase our collective understanding of walkability.

Figure 2.2: Map showing the four areas where QPED was deployed

2.9 QPED DATA COLLECTION MANUAL

QPED
Qualitative Pedestrian Environments Data

Data Collection Manual

Learning from the lived experiences of pedestrians

QPED
Qualitative Pedestrian Environments Data

What is QPED?

QPED is the Qualitative Pedestrian Environments Data Toolkit.

QPED helps communities and decision makers understand neighborhood walkability from the perspective of a different kind of expert: the people out walking in their communities.

QPED is a simple yet powerful toolkit of community engagement and data collection tools, protocols, and trainings for use by researchers, agencies, and community organizations to help them identify holistic strategies for improving neighborhood walkability in different community contexts.

Why QPED?

1. Standard approaches to measuring walkability may not be equally applicable across community contexts. For example, our review of research shows that standard built environment measures are stronger predictors of walking in higher-income, white areas than in low-income or communities of color.

2. Unlike surveys and audits, QPED gathers data without the filter of possibly biased, expert-derived priorities and measures.

3. Traditional community engagement strategies often miss the most vulnerable populations, who may have some of the most useful insights for decision makers and the most to gain from the right kind of investment in their community. QPED is an efficient and cost-effective way to reach beyond the "usual suspects."

Contents

QPED Team

QPED was developed at the University of Arizona in collaboration with Living Streets Alliance and with funding from the CDC's Physical Activity Policy Research Network (PAPRN+) and the National Institute for Transportation and Communities (NITC). Numerous former graduate students, funded by PAPRN+ and NITC, provided invaluable assistance in the development and testing of the QPED toolkit. They include: Vanessa Cascio, Michele Scanze, Ian Wan, Chris Ortiz y Pino, Gabriela Barillas-Longoria, Monica Landgrave-Serrano, Jhentille Cargill, Moises Lavoignet, Krista Hansen, and Sarah Meggison from the University of Arizona and Rose Haag, Kristin Milardo, and Molly Marcucilli from the University of Colorado Denver.

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Thank you to our partners and funders for making this work possible.

Welcome to QPED

Despite recent emphasis on big data in transportation decision-making, there are many instances where transportation professionals and community leaders are better served by going small with data collection that can capture important nuance and contextual factors. Traditional methods of gathering data on pedestrian environments include audits and resident surveys. These methods often exclude the voices of residents. At the same time, jurisdictions struggle to get representative participation through traditional community engagement strategies, including public meetings or community open houses.

Qualitative research methods, such as interviews and focus groups, are well-suited to capture nuanced resident perspectives that may be missed using these other approaches. However, these methods can be difficult to perform at a large enough scale or in a systematic enough way to guide decision-making. The QPED Toolkit was developed to meet this need. The project is a collaboration between researchers at the University of Arizona and Living Streets Alliance, a non-profit organization advocating for healthy communities through safer, more walkable streets. This project was funded by the Centers for Disease Control and Prevention's (CDC) Physical Activity Policy Research Network (PAPRN+) and the National Institute for Transportation and Communities (NITC).

This manual is intended to provide the tools needed for setting up, conducting, and analyzing brief on-street intercept interviews with people out walking in their communities. The Toolkit is designed to be flexible and adaptable to many community contexts and can be configured to help inform different types of decisions related to walking environments. For example, it has been used by researchers to understand subtle differences in perceptions of physical and social dimensions of walkability, as well as by practitioners to pinpoint where and how investment should be prioritized to align with community goals.

This document consists of a step by step guide to setting up, collecting, and analyzing data using QPED in your community. It also contains an appendix with the materials you'll need for conducting and analyzing data, including the QPED On-street Interview Guide; a supplemental On-street Interview Map Module; a script interviewers can use to engage pedestrians; and a template for data entry. The Toolkit with modifiable tools are also available at qped.org so you can make QPED work for your community.

Inspiration

Toward the end of a series of focus groups our research team realized we were not reaching far enough beyond those already engaged in community groups and neighborhood associations – the people most likely to attend a 1+ hour long event.

Members of our team went out onto the street and handed out fliers asking people to attend our last focus group, to be held at a nearby taqueria the next day.

They spoke with a young mother walking with two children, one in a stroller. She spoke very little English and walked for almost all of her transportation. The next day, kids in tow, she joined us for the focus group.

In response to the final question about what the city could do to make her neighborhood a better place for walking, she turned to the facilitator and said (translated from Spanish) "Come and talk to us. Like you did when you approached me."

After this experience our research team regrouped and decided to take our conversations onto the streets and to the people who we needed to be hearing from.

This was our inspiration for QPED.

"Come and talk to us."

QPED Step by Step

Step 1: Determine your QPED aims
Step 2: Identify areas of interest
Step 3: Identify interview locations
Step 4: Adapt interview guide
Step 5: Supplemental map module
Step 6: Train and schedule interviewers
Step 7: Conduct interviews
Step 8: Capture what you hear
Step 9: Analyze interviews
Step 10: Inform, share, guide
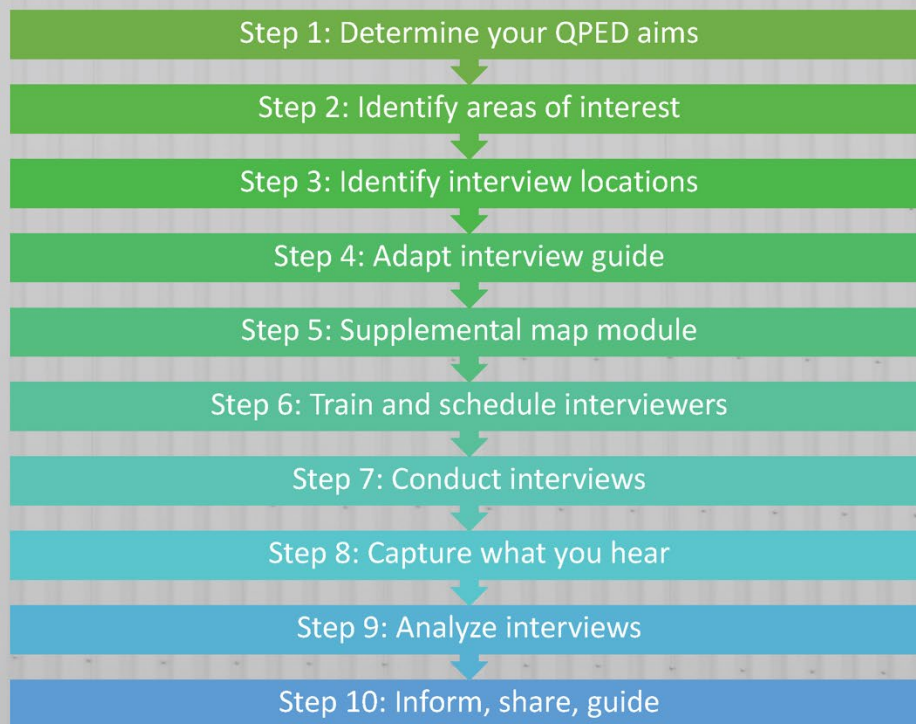
This field guide provides step by step instructions that will help ensure consistency in data collection efforts across multiple sites and conditions. It is written to make the data collection process easier and the data you collect more reliable by providing step by step instructions and addressing questions and concerns that may arise during planning, data collection, and analysis.

Done correctly using this step by step process, the on-street interviews you conduct will be tailored to help your community, as well as researchers and decision makers across the country better understand what walkability means in different socioeconomic and sociocultural contexts. The overall aim of QPED is to expand our understanding of what walkability means in different neighborhood contexts by engaging with residents and learning from the lived experience of pedestrians in different communities.

Step 1. Determine your QPED Aims

Through its use of open-ended questions, QPED is designed to be exploratory and create opportunities for capturing nuanced elements of neighborhood walkability that may not be on the radar of public officials or community leaders. But clearly stating your overall aims and having a general idea of what questions and which unknowns you are trying to answer with QPED will be key to planning for successful use of QPED in your community.

For example, if a community organization wants to inform a neighborhood visioning process by identifying opportunities and challenges related to neighborhood walkability, it may simply determine the area of interest and use the standard QPED on-street interview guide in that location. Responses to standard QPED questions should capture a breadth of perspectives which can be analyzed and shared to inform the community's vision.

If the same organization or a city agency wants to understand specific ways that it can improve walkability in a particular corridor (e.g. where should improved crossings be located), the location of interviews may need to be more specific and it may be necessary to add a couple more detailed questions that will help guide a specific project. Or perhaps you are interested in understanding how views of walkability are different between men and women or people in different parts of town.

Remember that one of the underlying principles of QPED is that interviews are conducted to allow pedestrians/residents to share their own priorities and concerns about walkability in their own voice and words. So remember that even if you are using QPED as part of a community engagement strategy for guiding a specific project, don't define your investigation too narrowly. Interviews should not focus only on infrastructure or the physical environment, even if that is your primary responsibility. This will help infrastructure projects be planned, designed, and delivered in ways that are compatible with underlying community perceptions as well as socioeconomic and sociocultural context.

EXERCISE Consider framing your aims and questions in this format:

We need to know _____ in order to _____.

For example:

We need to know what underserved neighborhoods in my jurisdiction think are the biggest barriers to walking in order to shape funding priorities under our city's new equity goals.

Step 2. Identify Areas of Interest

When choosing study areas or neighborhoods, you will need to identify the demographic and walkability characteristics that are of interest based on your overall aims identified in Step 1. You may focus on one area or be interested in making comparisons across multiple areas. Your area of interest may be predetermined by the parameters of an existing project, such as planned infrastructure investment in a specific corridor. Or, as in the case of our initial work in Tucson, you may identify locations with certain physical and social attributes in order to explore differences and disparities (see inset). In this way, strategic sampling across a city may can help answer larger questions about city policy, planning, and investment. Such an approach could guide the development of a pedestrian master plan or the transportation element of a comprehensive plan.

When collecting data from areas with different urban forms, be aware that choosing an area with a less walkable built environment may have fewer pedestrians, which would increase the amount of time needed to get a meaningful sample. This may still be worthwhile, as reaching these pedestrians may be critical to understanding challenges faced in these areas. People walking in these areas may be the least likely to engage through traditional community engagement strategies.

In addition to any project specific requirements, factors you may want to consider when identifying your area of interest include: built environment factors such as network density, sidewalk coverage and walk score, demographic characteristics, adjacent land uses, and safety factors such as pedestrian injury/fatality hotspots or high crash corridors.

Step 3. Identify Interview Locations

After you have determined your overall area of interest, the next step is choosing a narrower area where you will conduct interviews. This could be a particular district, blocks, or a corridor within your larger area of interest. You might identify several of these locations within your larger area of interest. For example, you may have identified Census Blocks or neighborhoods in step 2 and you must now highlight several intersections within this area for conducting interviews. Having a clear plan in place and visiting each location in advance will increase efficiency of data collection and improve data reliability in terms of achieving an appropriate sample.

In most cases you will want to choose interview locations where you expect at least moderate pedestrian activity such as commercial strips and/or areas with businesses, services, or transit stops that generate pedestrian traffic.

Your interviewers should not necessarily stay in one place, as this could oversample people walking in the area for a particular purpose, such as people shopping at a specific store. Prior to interviewing you should define boundaries around your interview location. For example, in a corridor you might pick an intersection as your starting point and draw a boundary that extends three blocks north and south of that point to approximate the extent of a small commercial corridor. If you are interviewing in a neighborhood commercial district or in a central business district, you should try to conduct interviews throughout the area. You may decide that reaching pedestrians on adjacent side streets would be helpful for achieving your aims. Make these decisions in advance, but we suggest empowering your on-street interview team to suggest adjustments if they notice opportunities to reach people who may have additional perspectives valuable to your overall aim.

Be sure the selected location captures residents of the neighborhood, not just those passing through, such as at a regional shopping center. In addition, you should be aware of particular locations that may be good or problematic for finding people to talk to. Grocery stores, cafes, libraries, transit stops/stations, and other activity generators are good places to identify prior to your first visit. But just because you find a good place for talking to people (maybe in front of a store) doesn't mean you should only talk to people there unless it is the only place people are walking. Keep moving.
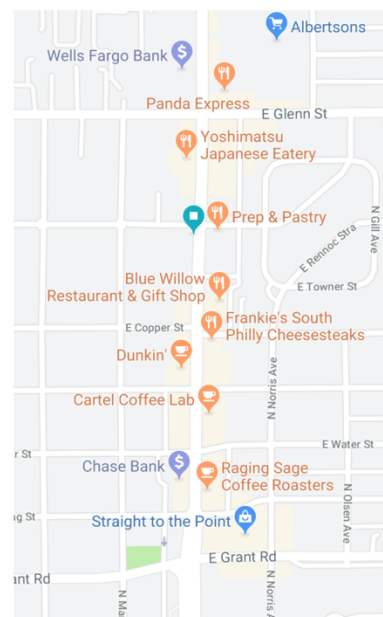
Step 4. Adapt Interview Guide

QPED is adaptable to the aims you identified in step one. You can add specific questions replacing standard items that may be of less use to you. The annotated Interview Guide show which items should always be included and those that can be swapped out.

You may also use the QPED Map Interview Add On if you are interested in identifying specific locations of opportunities and challenges related to walking. The map add on is intended to be used to aid in the interview process by allowing you to identify specific locations that correspond to what a respondent is referencing during their interview. For example, the map may help you identify specific locations where respondents are concerned about an unsafe crossing, think there should be additional lighting at night, or a community-oriented business that is an important walking destination. In addition to complementing the QPED Interview Guide you may opt to add specific prompts to the Map Add On. Instructions for using the Map Interview Add On are included in Figure X (Step 5).

Step 5. Supplemental Map Module

If you do not have access to a GIS or map editing tools, we suggest using Google Maps or OpenStreetMap. OpenStreetMap is a collaborative project to create a free editable maps that can be used to collect spatial data in your areas of interest. The map included in the Map Module template (Apendix B) was created using Google Maps.

Instructions for getting maps from Open Street Map/Google Maps:
- Navigate to your interview location(s) by entering a nearby address or intersection.
- Center the map on your interview location -- or locations if there are several in close proximity.
- Zoom so that the map extends ½ to ¾ mile in each direction from center. This should give you a wide enough extent to capture places of interest while still having a map that is legible when printed.
- Use a screen capture tool to copy the map:
  - With Windows 10: CTRL + SHFT + S or Windows Snipping Tool
  - With Mac OS: CTRL + SHT + 4
- Replace placeholder map in Map Add On .doc template (download at qped.org)
- Resize as necessary to fit into formatting
- Make sure map is legible when printed
- Repeat for each Interview location. Add to QPED Interview Guide and save each file with AOI and interview location clearly labeled.

These can be modified to fit your aims, but remember that focus should be on bringing forward individual/community perspectives

As much as you might want to save paper by printing the map module on the back of the interview guide, it will be easier on the clipboard if they are on separate pages.

Remember that some people you talk to will be better at reading maps than others. You might start by orienting them to where you are and which direction is which.

Step 6. Recruit, Train, Schedule

Recruit

When possible, we recommend using local community members or, at the very least, people familiar with a community to conduct interviews. Being somewhat familiar with the places and things people are talking about will make interviews more natural and conversational. If you are interviewing in a place where languages other than English are commonly spoken, you will need bilingual interviewers.

Train

In order to gather the richest data possible and reduce bias in data collection, interview teams should be trained using this manual and the downloadable QPED Training Presentation, which includes more detailed instructions and a guide for role playing and practicing before you being interviewing.

Individuals and teams should practice conducting interviews with one another before going into the field. Supervisors and/or other team members should review each team members interview notes after at least the first day of interviews to make sure each interviewer capturing an adequate level of detail. Always emphasize the importance of rich detail over quantity of interviews.

Scheduling

We recommend scheduling interviewers in pairs or groups. They might start out interviewing in pairs, but most of our interviews soon felt comfortable comfortable conducting interviews solo, but nearby to their partner or team.

Interview shifts of 2-3 hours are ideal. A sample schedule could be shifts from 9-11 AM; 11 to 1 PM; 4 to 6 PM. On average trained interviewers in a moderately trafficked area should average about 5 interviews per hour. In our previous work we have found that a minimum of 20 interviews in one area of interest is needed. In busier areas we easily exceeded 50 in each area.

We recommend interviews only during daylight hours. Always prioritize safety for your interviewers.

Step 7. Conduct Interviews

While interviewers should always go out in groups of at least two, interviews may be conducted in pairs or individually. We heard from interviewers that they started out interviewing in pairs (alternating between asking questions and taking notes) but soon realized it was possible to split up and conduct interviews individually (though still in close proximity to other interviewer).

To reduce bias, it is important to be systematic in how people are approached. Following each interview when you are ready to approach the next person, consider approaching the next person you see (or in busier places) the fifth person you see. Without such a system in place, you may unconsciously be biased toward talking to people who are more like you.

QPED interviews should feel like conversations. Learn the questions so you are not reading them. Introduce yourself right away and briefly explain why you are interviewing (your aims).

Use follow up questions where appropriate, but without leading someone to a particular answer. For example, don't prompt someone to talk about something they haven't mentioned. But do ask them to expand if they've said something vague. For example: "I feel unsafe" could be followed with, "What makes you feel unsafe?" Or simply "Can you tell me more about that?" This way you won't be entering your notes later that day and realize you don't know whether they felt unsafe because of crime or because of speeding cars.

Also, keep in mind that in the open-ended questions people may start answering a later question. For example, when you ask what people like about an area for walking, they may say a couple of positive things and then immediately switch into talking about negative elements, which are part of the next question. That's fine, but use your judgement and, as necessary, start filling in the interview guide for the later question. This is important because if someone starts talking about a liquor store as being a negative element related to walkability and you write "liquor store" under the positive prompt, that could lead to that response being mistakenly coded. Go with the flow, but keep your notes accurate.

Try to be natural and conversational, but avoid expressing agreement or disagreement with what people are saying. Even nodding in agreement or saying "that's great" in response to what someone says can register as approval, which may alter what people say.

Be mindful that you are interrupting people's lives. If they need to leave before the interview is over, that's ok. Don't make them miss their bus.

Data Entry

At the end of each interview shift, take the time to enter your notes into the online repository (or other system you've set up). This is another chance to correct mistakes, add punctuation, make sure quotes are clearly marked, etc. If someone answered questions out of order, this is another chance to make sure it's in the appropriate place

Your team will need to decide whether notes are to be entered in original language or translated at this stage if you are interviewing in multiple languages.

Keep your hardcopy interview notes and hand them into your supervisor for safe keeping

A trick from one a grad student interviewer: "if someone was wearing something notable, I would write down 'Metallica t-shirt' or whatever and when I saw that note the conversation would come back to me clear as day that evening when entering notes."

You can enter notes using the online data entry system or directly into a spreadsheet (both available at qped.org). One advantage of the online data entry system is that it includes a "code as you go" data entry feature than can save time during your analysis.

Question 2: What are some things you like about this area as a place for walking?

Q2 - notes *

Lorem ipsum dolor sit amet, consectetur adipiscing elit.
"Suspendisse a mi dictum, porttitor lorem quis, luctus velit. Duis blandit risus magna, sit amet gravida nisi congue ac."

Donec egestas urna in sapien tristique, eu pellentesque mi semper. Integer accumsan vestibulum felis, vel aliquam odio pellentesque at.

"Nunc interdum nisi risus, in interdum ligula bibendum ac. Pellentesque iaculis nulla iaculis iaculis dapibus. Nunc nec massa leo."

Nulla vel consectetur nunc, at egestas ligula.
Etiam rhoncus erat ac urna dictum, sed interdum lorem rutrum.
Nulla at nisl nec augue convallis venenatis. Maecenas mollis est eu nisl sodales condimentum.

Q2 - Positive Physical Dimensions Coded
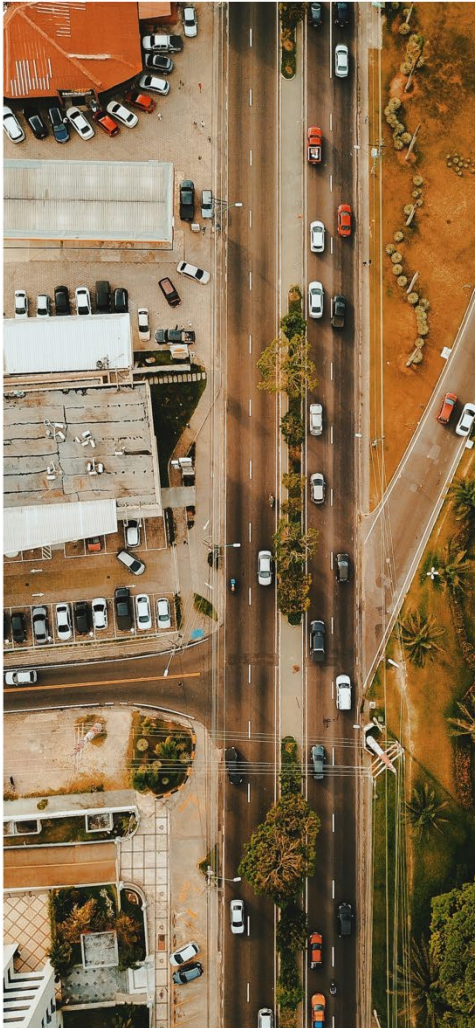
☐ Supportive infrastructure (+)

☑ Well maintained (+)

☐ Aesthetics (+)

☑ Parks (+)

Step 9. Analysis

Depending on your aims and the capabilities of your team, analysis of interview notes can be simple or involve more sophisticated qualitative or some basic statistical analysis.

The first step is coding interviews by topic or theme. We've made this easy be including the first stage of coding into the data entry form. Our coding scheme is based on our pilot work in Tucson, L.A., and Denver where we identified 14 characteristics people talked about the most.

As you use QPED in your community, however, you should always be open to hearing something unexpected and adding your own themes.

Coding helps you organize what you are hearing. But remember that the strength of QPED lies in retaining the voice and perspective of pedestrians.

For more detail on how we have analyzed QPED interviews, read our *Journal of Transport and Health* article linked from qped.org.

Step 10. Share, Inform, Guide

The final step will depend on what you have set out as your aims and what you heard through QPED in the community where you are working. But we recommend always sharing back with the community what you've learned. We recommend doing this using multiple approaches, as the cross-section of people you've talked to will likely not all attend neighborhood meetings and other common venues for community conversations. Get creative.

Work with your community partners and stakeholders you should plan for community dissemination from the beginning of your project.

One option you might plan for is to ask people for email addresses during your interview to be able to share your findings with them. Keep an email list on a separate sheet of paper to maintain confidentiality of what people are writing down.

Having clearly formed aims will help you use your QPED findings to inform policy or planning decisions. Look back to your "in order to" statements from step #1. QPED is useful for talking to decision-makers, such as elected officials, because some are more interested in how many people said what, while others will be more moved by the voice of community that comes through in direct quotes.

In addition to sharing your QPED findings with community members and decision-makers, please also let us know what you've learned. You can email us or contact us through qped.org. We may also reach out to find out how things are going or if you have suggestions for improving QPED for everyone.

City:	Study Area:	Nearest intersection:	
Date:	Day of week:	Time:	Survey taker:

1. Where are you walking to this morning/afternoon? / ¿Dónde esta caminando esta mañana/tarde?

[ ] to/from work   [ ] to/from school   [ ] shopping/errands   [ ] social   [ ] just for exercise   [ ] other _____

2. What are some things you like about this area as a place for walking? /
¿A cuáles son las cosas que le gustan en esta área para caminar?

3. What are some things you do not like about this area as a place for walking?
¿ A cuáles son las cosas que no le gustan en esta área para caminar?

4. Are there any other things that could make this area better for walking?
¿Hay otras cosas que podría mejorar este área para caminar?

5. What are the most important things you think the city should do to make this area better for walking?
¿Cuáles son las cosas más importantes que la ciudad debe hacer para que esta área sea mejor para caminar?

6. How often do you walk in this area? /¿Con qué frecuencia usted camina en esta área?	7. Do you have (access to) a car? *¿Usted tiene un carro?*
[ ] Every day [ ] A few times/week [ ] About once/week [ ] < than once per week	[ ] yes [ ] no

8．How would you rate this area as a place for walking? // ¿Cómo calificaría esta área como un lugar para caminar?

<div align="center">1   2   3   4   5</div>

9. How safe do you feel walking in this area during the day? *¿Qué tan seguro se siente caminar en esta área durante el día?*	10. How safe would you feel walking in this area at night? *¿Qué tan seguro se siente caminar en esta área por la noche?*
(very unsafe) 1 2 3 4 5 (very safe)	(very unsafe) 1 2 3 4 5 (very safe)

11. How satisfied are you with the selection of businesses or services that you can walk to in this area?
¿Está satisfecho con la selección de negocios o servicios de que se puede caminar en esta área?

<div align="center">(not at all satisfied)   1   2   3   4   5   (very satisfied)</div>

12．What other types of businesses or services would make this area better for walking?
¿Qué otros tipos de negocios o servicios haría esta área mejor para caminar?

| 13. What is the closest intersection to your home? *¿Cuál es la intersección más cerca de su casa?*			
What is your age?	M or F	Race/Ethnicity:	In Span. or Eng:
[ ] 18-30 [ ] 31-55 [ ] 55-70 [ ] 71+	[ ] M [ ] F	[ ] H/L [ ] W, non-H/L [ ] Black/AA [ ] Other	[ ] S [ ] E

M1. Can you show me approximately where you live on this map? **Mark map w/ X   or   [ ] Respondent lives off map**

M2. Are there any specific places in the area that make it difficult or unpleasant to walk? Indicate where. Describe.

M3. Are there any specific places that help make this area a better place for walking? Indicate where. Describe.

→ Use A, B, C, etc. to mark locations on map AND make notations in correct column below

M2 – Negative Notes	M3 – Positive Notes

QPED
Qualitative Pedestrian Environments Data

www.qped.org
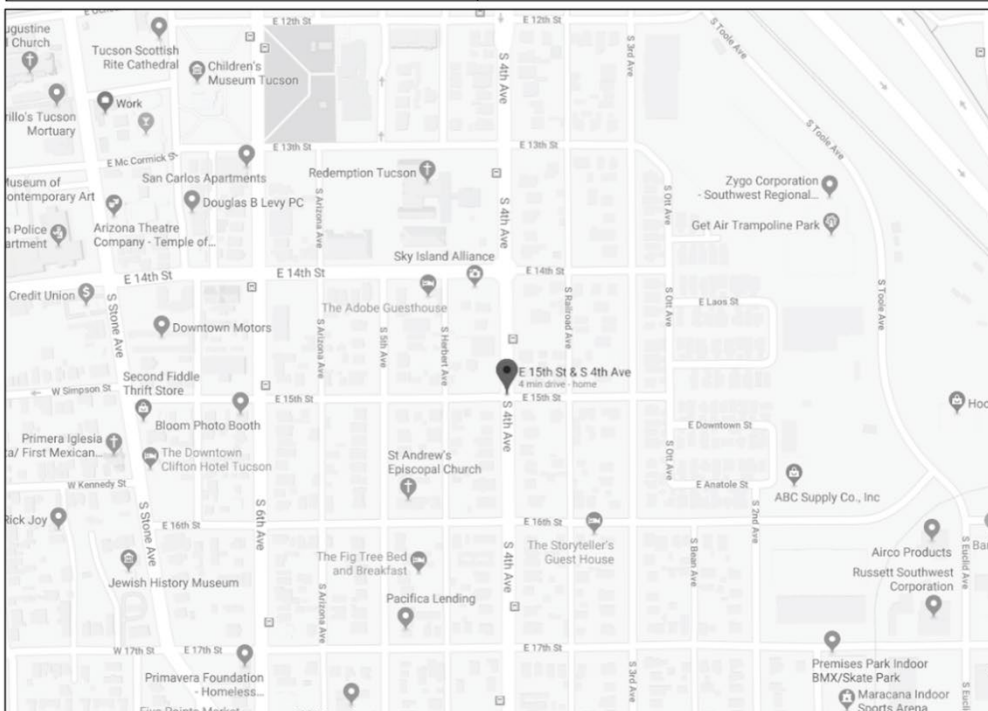
3.0   QPED DEPLOYMENT AND FINDINGS

Our study was designed specifically to test for differences in perceived attributes of walkable places between Hispanic-Latino and non-Hispanic white areas. This is just an example of how QPED can be deployed, and comparison between places is not a necessary component. For the purposes of comparison in our study, neighborhoods were selected that were either 75% or more Hispanic/Latino or 75% or more non-Hispanic white. As in the Tucson/Pima County pilot, study areas were selected to control for certain built environment and demographic characteristics, including median household income, poverty rates, Walk Scores, and sidewalk coverage.
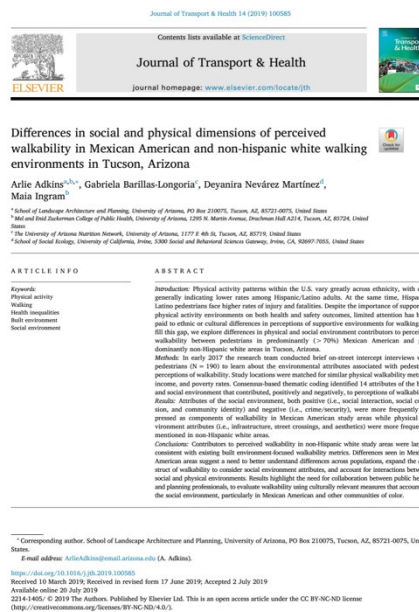

Figure 3.1: Initial findings from on-street intercept interviews published in *Journal of Transport and Health*

Beyond the seven original locations in Tucson/Pima County, this process identified six locations in Denver, six locations in Los Angeles County, and two locations in Orange County. As in Tucson/Pima County, these locations were shared with locally knowledgeable individuals (in this case, community engaged researchers from University of Colorado Denver and UC Irvine) who confirmed that these were moderately walkable places likely to generate enough pedestrian activity to create opportunities for on-street interviews.

3.1   DATA COLLECTION TEAM

A team of University of Arizona graduate students traveled to Colorado and California to conduct on-street interviews in Denver, Los Angeles, and Orange counties. Additional graduate students were hired from University of Colorado Denver to aid in our data

collection in Denver. The data collection team was trained extensively using an early prototype of the QPED Data Collection Manual, which included role playing, several practice interviews, and note-taking practice. The University of Arizona data collection team members were all fluent in both English and Spanish.

3.2 OVERVIEW OF PARTICIPANTS

The research team conducted a total of 706 on-street intercept interviews, including 240 in Los Angeles County, 207 in Denver, 190 in Pima County, and 69 in Orange County. Age distributions were similar across study sites with 31% of participants 18-29 years, 48% 31-54 years, 16% 55-69, and 4% 70 and older. The only study site that had a significantly different distribution was Denver, which skewed younger with 40% of participants in the 18-30 years old bracket. Of the participants, 55% were male and 45% female.

In Los Angeles County, our random sampling of pedestrians indicates that the pedestrian population there was considerably more diverse than the demographics of those living in the area. In the subset of study areas selected for being predominantly (>75%) non-Hispanic white, 44% of pedestrians we interviewed identified as Hispanic/Latino and 9% identified as Black/African American. Only 25% of participants in these areas identified as non-Hispanic white (for comparison, 84% of participants identified as non-Hispanic white in predominantly non-Hispanic white areas in Denver).

3.3 FINDINGS

Across all sites, 65% of trips intercepted were for utilitarian purposes, such as commuting or errands (Figure 3.1). Consistent with our initial findings in Tucson, a higher share of trips in predominantly Hispanic-Latino areas (72%) were utilitarian than in white non-Hispanic areas (56%). The pattern of a higher share of utilitarian trips in Hispanic-Latino areas than white non-Hispanic areas held true everywhere but Los Angeles County.
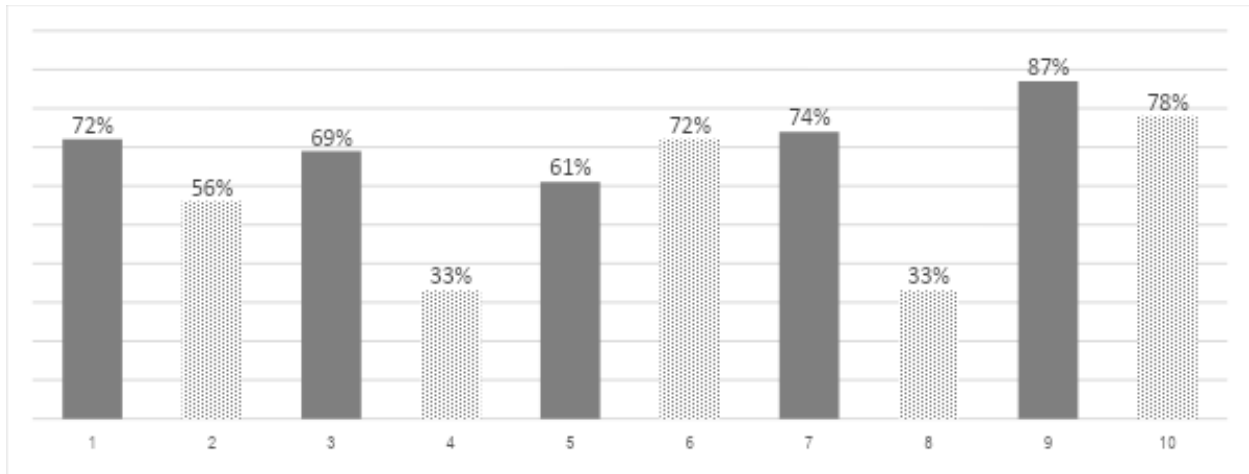
Figure 3.2: Share of respondents walking for utilitarian purposes, such as going to work/school, running errands, or going to a medical appointment. The remainder of trips were for leisure or exercise. Sites marked with * are significant differences at the 95% confidence level based on z-scores

Our initial findings from Tucson, published in the *Journal of Transport and Health* (Adkins et al., 2019), were notable because of the stark differences between participant conceptions of walkability in Hispanic-Latino areas versus white non-Hispanic areas. Most notably, aspects of the social environment related to social capital, such as community identity, social cohesion, and social interaction were far more likely to be mentioned as positive aspects of a place for walking in Hispanic-Latino areas compared to white non-Hispanic areas. The Tucson data also suggested that elements related to infrastructure, aesthetics, and a walking environment being calm and quiet were more important in non-Hispanic white areas.
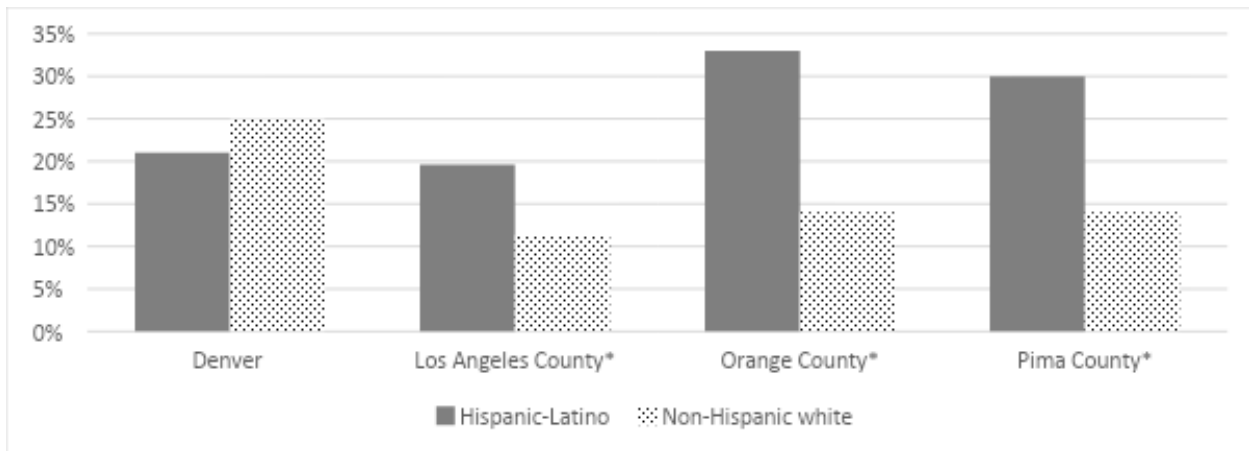

Figure 3.3: Share of interviews mentioning social cohesion, social interaction, or community identity as a positive of the walking environment (comparing Hispanic-Latino and non-Hispanic white). Sites marked with * are significant differences at the 95% confidence level based on z-scores

Table 3.1: Share of interviews that mentioned selected themes as contributing to supportive walking environment

	Destinations	Aesthetics	Calm + quiet	Social interaction	Social cohesion	Comm. identity	Any social capital
				Social capital domains			
Interviews across all sites							
Hispanic-Latino (n = 360)	35%	***4%**	***9%**	10%	5%	***13%**	***25%**
White non-Hispanic (n = 346)	35%	***15%**	***19%**	7%	4%	***6%**	16%
All sites total (n = 706)	35%	9%	14%	9%	6%	9%	21%
Denver County							
Hispanic-Latino (n = 98)	**^40%**	***8%**	***19%**	***1%**	***8%**	***15%**	21%
White non-Hispanic (n = 109)	**^52%**	***23%**	***8%**	***11%**	***12%**	***6%**	25%
Denver County total (n = 207)	46%	16%	13%	6%	10%	10%	22%
Los Angeles County							
Hispanic-Latino (n = 117)	27%	3%	8%	9%	3%	9%	**^20%**
White non-Hispanic (n = 123)	27%	7%	15%	7%	2%	7%	**^11%**
Los Angeles total (n = 240)	27%	5%	12%	8%	2%	8%	16%
Orange County							
Hispanic-Latino (n = 27)	48%	7%	7%	**^11%**	0%	7%	**^*33%***
White non-Hispanic (n = 42)	54%	12%	12%	**^0%**	0%	10%	**^*14%***
Total Orange County (n = 69)	52%	10%	10%	4%	0%	9%	22%
Pima County							
Hispanic-Latino (n = 118)	***36%**	***0%**	***2%**	***19%**	***7%**	***17%**	***30%**
White non-Hispanic (n = 72)	***14%**	***18%**	***44%**	***6%**	***0%**	***0%**	***14%**
Total Pima County (n = 190)	28%	7%	18%	14%	4%	11%	24%

Significant differences (based on z-scores) at the 95% confidence level (*) and 90% confidence level (^) are **bolded**.

These patterns largely held true across three of the four study sites (Table 3.1). In Denver, however, social capital themes were slightly more frequent in interviews in non-Hispanic white areas. Denver's non-Hispanic white areas had the highest share of social capital mentions with 25% compared to 16% across all study sites, 11% in Los Angeles County, and 14% in both Orange and Pima Counties (Figure 3.2). Denver was also the only study site where "calm and quiet" was more frequently mentioned in Hispanic-Latino areas (19%) than non-Hispanic white areas (8%).

In general, patterns of difference initially observed in Tucson/Pima County between Hispanic-Latino and non-Hispanic white areas held true in the other study sites, though with some exceptions and in some cases with less notable difference. For example, as

previously mentioned, social cohesion and social interaction were higher in white non-Hispanic areas in Denver while community identity was higher in Hispanic-Latino areas. And in some cases, the direction of difference was similar to what was observed in Tucson/Pima County, but not determined to be statistically significant based on a test of z-scores. Nonetheless, across the entire sample (25% vs 16%) and in Los Angeles County (20% vs 11%), Orange County (33% vs 14%), and Pima County (30% vs 14%), participants in Hispanic-Latino areas were more likely to mention aspects of social capital as being positive contributors to walkable environments than those in non-Hispanic white areas.

Based on the entirety of our data collection, it remains clear that various domains of social environments need to be recognized as important elements of walking environments. Better understanding of the social environment contribution to perceptions of walkability is needed to develop more complete conceptions of walkability across socioeconomic and sociocultural contexts.

4.0 QPED TOOLKIT REFINEMENT AND DISSEMINATION

Following successful deployment of the on-street interview protocol across 21 sites in three states, the research team turned its attention to sharing our findings through academic journal articles and in presentations to researchers and practitioners. At several presentations about our pilot findings from Tucson, attendees asked how they could do something similar in their communities. This gave us the idea to refine and package our data collection tools in a publicly available toolkit. This is also when we decided to brand the toolkit as the Qualitative Pedestrian Environments Data (QPED) Toolkit.

We redesigned the interview guide to be more self-explanatory and user friendly for those outside of our research team. For training purposes, we also developed a data collection manual that was based on our in-person trainings on the tool at workshops in Oregon and Florida. We also added a map module based on requests to have a map on which interviewers could indicate the location of something a participant mentioned.

The toolkit consists of the following:

- QPED Data Collection Manual
- QPED On-street Interview Guide
- QPED On-street Interview Map Module

The toolkit is available for download at QPED[5].org. The website also provides an overview of the tool, its purpose, and its development, as well as a links to examples of our team's use of the tool.

4.1 TOOLKIT DISTRIBUTION AND QPED.ORG

The QPED toolkit was given a soft launch at a workshop during the September 2019 Transportation and Communities Summit in Portland, Oregon. Feedback from this workshop was used to further refine the training and data collection manual. The official launch of QPED was at the Active Living Conference (formerly ALR) in Orlando, Florida, in February 2020. This event was attended by roughly 25 researchers and practitioners from the fields of public health, urban planning, and medicine from across the U.S. Unfortunately, this successful launch occurred only a few weeks before the COVID-19 pandemic and shutdown, which dramatically curtailed interest in intercept surveys and made continued trainings on the tool impractical.

During this time and into the present, the QPED website has been an important channel for sharing the toolkit. Since it was launched, we have seen nearly 1,000 visits to the site from 716 unique visitors. These visitors are from across the U.S. (Figure 4.1) and around the world (Figure 4.2).
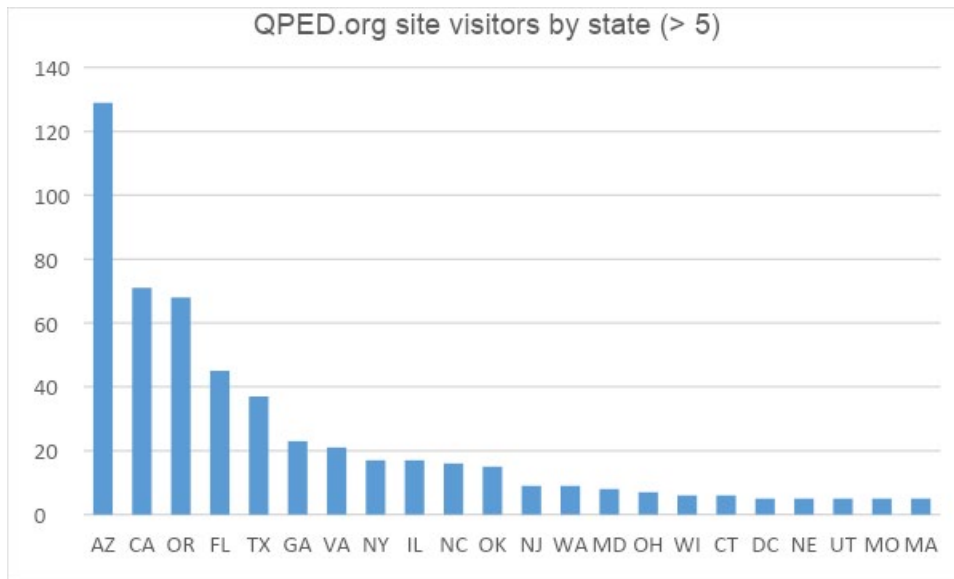
Figure 4.1: QPED.org site visitors by state (all states with five or more visitors)
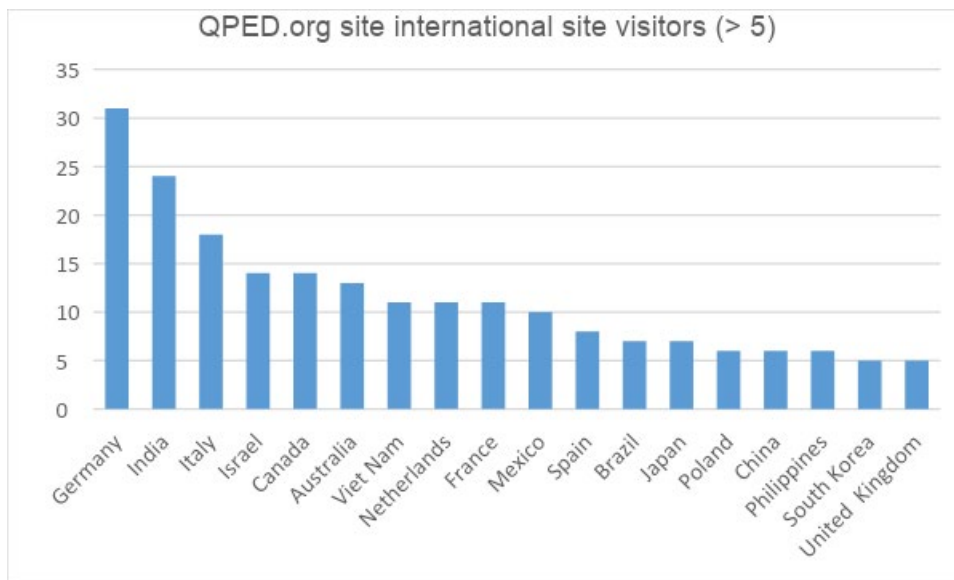

Figure 4.2: QPED.org international site visitors by country (all countries with five or more visitors)

Downloading the toolkit requires signing into the website, so we have been able to track who has registered to download the toolkit. The toolkit has been downloaded 55 times, including by staff from 10 cities (or city-level DOTs) across six states, five state DOTs, five private planning/engineering firms, five national or state-level non-profits, four state or county health departments, and four transit agencies or MPOs. In addition, researchers from 21 universities across 11 U.S. states as well as Australia, Malaysia, Philippines, South Korea, and Sri Lanka have downloaded the toolkit.

5.0 SURVEY DEVELOPMENT AND SYSTEMATIC REVIEW OF SOCIAL ENVIRONMENT MEASUREMENT

The final phase of this research was to be a mailed survey designed to test some of the findings from our on-street intercept interviews. In addition to analyzing our interview data to highlight themes that could be asked about in a mailed survey, we also conducted an extensive systematic review to identify ways in which existing surveys ask about social aspects of walking environments. With this information, the research team developed a survey, piloted it internally, and revised the survey instrument. While the COVID-19 pandemic prevented us from sending out the survey, we see value in the survey for potential future use and we were able to turn our review of existing walking environment surveys into a journal article published in *Health and Place* (Iroz-Elardo et al., 2021).

The survey was developed based on findings from walking focus groups; on-street intercept interviews in Tucson, Denver, Los Angeles and Orange counties; and our extensive review of the literature on measurement of walking environments. The survey is designed specifically to measure the relative importance of various physical and social[6] environmental characteristics that may contribute to a place being supportive or unsupportive of walking.

5.1 QPED SURVEY DRAFT

NEIGHBORHOOD WALKING STUDY

Thank you for agreeing to take this survey about what makes your neighborhood a good place for walking and what could make it better. This survey should take 5 to 10 minutes of your time to complete. Your answers will help us better understand how to achieve safer, more confortable, and more enjoyable places for residents of your neighborhood to walk.

1. Please read the statements about your neighborhood and state whether you agree or disagree with them:	Strongly disagree	Somewhat disagree	Somewhat agree	Strongly agree
My neighborhood is a good place for walking.	☐ 1	☐ 2	☐ 3	☐ 4
There are many places to go within walking distance of my home.	☐ 1	☐ 2	☐ 3	☐ 4
It is easy to walk to a transit stop (bus or rail) from my home.	☐ 1	☐ 2	☐ 3	☐ 4

	Less than 1 year	1 to 5 years	6 to 10 years	11 to 20 years	More than 20 years
2. How long have you lived in your current house?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
3. How long have you lived in your neighborhood?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
4. If you have family in the area, how long have they lived there?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

5. In the last 7 days, on how many days did you walk to get **to a destination** in or near your neighborhood?	_____ Days	☐ 0 I did not walk
6. In the last 7 days, on how many days did you walk **for recreation, exercise or for walking a dog** in or near your neighborhood?	_____ Days	☐ 0 I did not walk
7. In the last 7 days, on how many days did you walk **to get to public transit (bus or train)?**	_____ Days	☐ 0 I did not walk
8. In the last 7 days, on how many days did you **ride a bicycle** (outside)?	_____ Days	☐ 0 I did not walk

	Strongly disagree	Somewhat disagree	Somewhat agree	Strongly agree
The presence of police in my area makes my neighborhood a better place for walking.	☐ 1	☐ 2	☐ 3	☐ 4

9. How important do you consider each of the following to be in determining whether a neighborhood is a good place for walking?

	Not at all important	Slightly important	Moderately important	Very important	Extremely important	Top Five
Having sidewalks and paths	☐1	☐2	☐3	☐4	☐5	☐
Having a grocery store nearby	☐1	☐2	☐3	☐4	☐5	☐
Having areas that are well-lit at night	☐1	☐2	☐3	☐4	☐5	☐
Having restaurants/cafes nearby	☐1	☐2	☐3	☐4	☐5	☐
Feeling like a part of the community	☐1	☐2	☐3	☐4	☐5	☐
Seeing culture represented in art, buildings, and businesses	☐1	☐2	☐3	☐4	☐5	☐
Knowing and trusting my neighbors	☐1	☐2	☐3	☐4	☐5	☐
Having friends and acquaintances nearby	☐1	☐2	☐3	☐4	☐5	☐
Having transit nearby (buses or trains)	☐1	☐2	☐3	☐4	☐5	☐
Having trees or vegetation	☐1	☐2	☐3	☐4	☐5	☐
Feeling safe from cars	☐1	☐2	☐3	☐4	☐5	☐
Well-maintaned private property (yards, buildings, etc)	☐1	☐2	☐3	☐4	☐5	☐
Feling safe from crime	☐1	☐2	☐3	☐4	☐5	☐
Cars not driving too fast	☐1	☐2	☐3	☐4	☐5	☐
Knowing that my neighbors are looking out for me	☐1	☐2	☐3	☐4	☐5	☐
Having attractive buildings or homes	☐1	☐2	☐3	☐4	☐5	☐
Having parks and/or open space nearby	☐1	☐2	☐3	☐4	☐5	☐
Well-maintaned public spaces (streets, alleys, parks, plazas)	☐1	☐2	☐3	☐4	☐5	☐
Having neighborhood schools nearby	☐1	☐2	☐3	☐4	☐5	☐
Having roots (family history) in the community	☐1	☐2	☐3	☐4	☐5	☐
Seeing kids and families out and about	☐1	☐2	☐3	☐4	☐5	☐
Having many nearby shops/restaurants to choose from	☐1	☐2	☐3	☐4	☐5	☐
Seeing people from different generations out & about	☐1	☐2	☐3	☐4	☐5	☐
Having family nearby	☐1	☐2	☐3	☐4	☐5	☐
Calm and quiet	☐1	☐2	☐3	☐4	☐5	☐
Having fast food and/or convenience stores nearby	☐1	☐2	☐3	☐4	☐5	☐
Seeing people like me out on the street/sidewalk	☐1	☐2	☐3	☐4	☐5	☐
Seeing different types of people out on the street/sidewalk	☐1	☐2	☐3	☐4	☐5	☐
Seeing many people out on the street/sidewalk	☐1	☐2	☐3	☐4	☐5	☐

10. If you haven't done so already, please select the five most important from the list above.

11. Please read the following statements about your neighborhood and state whether you agree or disagree with them:

	Strongly disagree	Somewhat disagree	Somewhat agree	Strongly agree
There are adequate sidewalks and/or paths in my neighborhood	☐ 1	☐ 2	☐ 3	☐ 4
There is a grocery store within walking distance of my home	☐ 1	☐ 2	☐ 3	☐ 4
My neighborhood streets are well-lit at night	☐ 1	☐ 2	☐ 3	☐ 4
My neighborhood has restaurants and /or cafes I can walk to	☐ 1	☐ 2	☐ 3	☐ 4
I feel like I am part of the community in my neighborhood	☐ 1	☐ 2	☐ 3	☐ 4
Culture is represented in art, buildings, and local businesses	☐ 1	☐ 2	☐ 3	☐ 4
I know and trust my neighbors	☐ 1	☐ 2	☐ 3	☐ 4
I have friends and acquaintances nearby	☐ 1	☐ 2	☐ 3	☐ 4
There are transit stops that I can walk to	☐ 1	☐ 2	☐ 3	☐ 4
There are trees and/or vegetation in my neighborhood	☐ 1	☐ 2	☐ 3	☐ 4
I feel safe from cars in my neighborhood	☐ 1	☐ 2	☐ 3	☐ 4
Private properties are well-maintaned	☐ 1	☐ 2	☐ 3	☐ 4
I feel safe from crime in my neighborhood	☐ 1	☐ 2	☐ 3	☐ 4
Cars drive too fast in my neighborhood	☐ 1	☐ 2	☐ 3	☐ 4
I feel like my neighbors are looking out for me	☐ 1	☐ 2	☐ 3	☐ 4
There are attractive buildings or homes to look at	☐ 1	☐ 2	☐ 3	☐ 4
There are parks and/or open space nearby in my neighborhood	☐ 1	☐ 2	☐ 3	☐ 4
Public spaces are well-maintaned	☐ 1	☐ 2	☐ 3	☐ 4
There are neighborhood schools nearby	☐ 1	☐ 2	☐ 3	☐ 4
I have roots and/or family history in this community	☐ 1	☐ 2	☐ 3	☐ 4
I often see kids and families out and about	☐ 1	☐ 2	☐ 3	☐ 4
There are many nearby shops and/or restaurants I can walk to	☐ 1	☐ 2	☐ 3	☐ 4
There are people from different generations out & about	☐ 1	☐ 2	☐ 3	☐ 4
I have family nearby	☐ 1	☐ 2	☐ 3	☐ 4
My neighborhood is calm and quiet	☐ 1	☐ 2	☐ 3	☐ 4
There are fast food/convenience stores nearby	☐ 1	☐ 2	☐ 3	☐ 4
I see people like me in my neighborhood	☐ 1	☐ 2	☐ 3	☐ 4
I see different types of people in my neighborhood	☐ 1	☐ 2	☐ 3	☐ 4
I see many people out and about in my neighborhood	☐ 1	☐ 2	☐ 3	☐ 4

12. Are you:

☐₁ Male   ☐₂ Female

13. In what year were you born:

_____

14. Could you please tell us your weight:

Pounds _____ or Kilos _____

15. Could you please tell us your height:

Ft _____ In _____ or Meters _____

16. What is the highest level of education that you have completed? (Please check just one)

Less than high school	High school	Some college	College degree	Graduate degree
☐₁	☐₂	☐₃	☐₄	☐₅

17. What is your annual household income? (Please check just one)

Less than $20,000	$20,000 to $44,999	$45,000 to $74,999	$75,000 to $149,999	More than $150,000
☐₁	☐₂	☐₃	☐₄	☐₅

18. Do you currently have a driver's license?

☐₁ Yes   ☐₂ No

19. How many cars/trucks/vans are owned or leased by members of your household?

_____

20. Is one of these cars/trucks/vans available for your use most days?

☐₁ Yes   ☐₂ No

21. Do you have access to a working bicycle on most days?

☐₁ Yes   ☐₂ No

22. In general, would you say your health is: (Please check just one)

Poor	Fair	Good	Very good	Excellent
☐₁	☐₂	☐₃	☐₄	☐₅

23. In general, would you say your mental health is: (Please check just one)

Poor	Fair	Good	Very good	Excellent
☐₁	☐₂	☐₃	☐₄	☐₅

24. Have you ever been diagnosed one or more of the following diseases: (Please check all that apply)

High cholesterol	Diabetes	Heart disease / stroke	Respiratory problems	Overweight / obese
☐₁	☐₂	☐₃	☐₄	☐₅

25. In addition to you, how many people live in your household?

None, just me	1 person	2 people	3 people	4 or more
☐₀	☐₁	☐₂	☐₃	☐₄

26a. How many are children between the ages of zero and 15? _____

26b. How many are children between the ages of 16 and 18? _____

27. Do you consider yourself Hispanic or Latino/a?

☐₁ Yes   ☐₂ No

28. Do you consider yourself:

☐₁ White or Caucasian
☐₂ Black or African American
☐₃ American Indian or Alaska Native
☐₄ Native Hawaiian or Pacific Islander
☐₅ Asian
☐₆ Multi-racial
☐₇ Other

5.2 SYSTEMATIC REVIEW OF MEASUREMENT OF SOCIAL ELEMENTS OF WALKING ENVIRONMENTS

As we delved into the literature to build our own survey, we identified a gap in the literature regarding how social elements of walking environments are measured. We decided to fill this gap through a scoping review of survey instruments that measure perceived social elements of walking environments. By reviewing 1,077 survey items from 20 influential survey instruments, we identified and organized 182 items related to social environments into domains. This helps to identify trends in how social environments are conceptualized and measured in research on pedestrian environments.
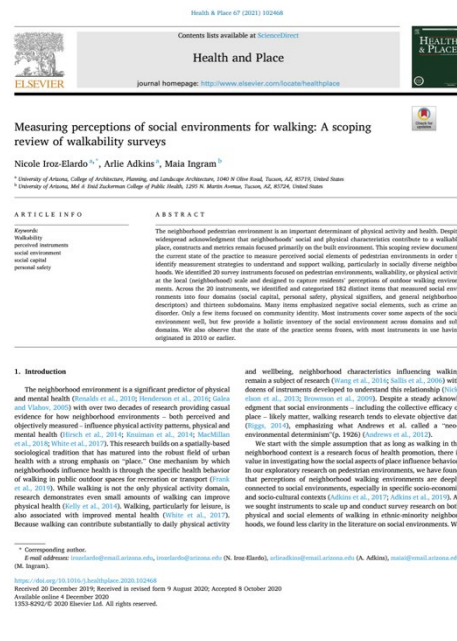
Figure 5.1 Systematic review published in *Health and Place*

We identified survey instruments focused on walkability, pedestrian environments, or physical activity at the neighborhood scale through a multistage screening process. We reviewed four source lists of tools/instruments and systematically screened each citation for social perception items. We recorded and categorized these items into domains and subdomains based on themes in the literature.

We categorized 182 social environment items from 20 survey instruments and 1,077 unique items into four domains: social capital, personal safety, physical signifiers, and general neighborhood descriptors. The distribution of items varied across instruments, with most focusing on social cohesion and control, social interactions and networks, personal safety, and physical signifiers like aesthetics and maintenance.

Social Capital: Items measuring social capital were categorized into subdomains such as social interactions and networks, social cohesion and control, social conduct norms for walking, participation in organizations, and community identity. Most items focused on social cohesion and interactions, with fewer items addressing community identity and organizational involvement.

Personal Safety: These were divided into crime-specific and general safety categories. Crime-specific items were more common, highlighting concerns about crime and safety in the area.

Physical Signifiers: Items related to physical signifiers included aesthetics, maintenance/disorder, greenspace, and lighting. These items provided visual cues about social capital and personal safety in the neighborhood.

General Neighborhood Social Descriptors: Items that were broadly focused on neighborhood satisfaction and socioeconomic indicators, reflecting overall perceptions of the neighborhood environment.

The review revealed that while survey instruments have been developed to measure social elements of walkable places, there are gaps in capturing the multidimensional nature of social environments. Across these 20 surveys we observed that, on average, 7.5% of survey items were related to social capital, though four of 20 had zero questions related to one of the domains of social capital and four more had only one item. Researchers are incorporating social elements of walkable places, but only a small handful do so in ways that touch on the multiple dimensions of social capital. Many instruments emphasize crime and disorder rather than positive elements of social cohesion or community identity. The lack of recent instruments, partly due to a tendency for researchers to use previously validated instruments and items, also suggests a need to update and test tools that better reflect our understanding of social environmental factors, particularly for communities of color who face greater barriers to safe public spaces.

In summary, this review identified 182 items related to perceived social aspects of walking across 20 survey instruments. We categorized these items into domains and subdomains, highlighting the need for more comprehensive instruments to capture the multidimensional nature of social environments. Future research should focus on developing updated instruments that reflect the complex role of social environmental factors in walking and physical activity, especially in different socioeconomic and sociocultural contexts.

6.0 CONCLUSION

This report summarizes the research team's efforts to develop, test, deploy, and disseminate a new tool for the systematic collection of qualitative pedestrian environments data through brief on-street intercept interviews. This method was developed to help researchers and practitioners overcome shortcomings related to biased standard measures of walkable environments and challenges reaching broad cross sections of the walking public using traditional data collection methods.

The data collection tool performed well and appears to be cost effective and well suited for elucidating nuanced elements of walking environments that other methods might overlook. The data collection tool was employed at four study sites across three states with response rates exceeding 50%. Thematic coding of interview data from these study areas shows that aspects of the social environment tend to be more salient in Hispanic-Latino areas while infrastructure and aesthetics are more salient in non-Hispanic white areas. Initial findings from Pima County were previously published in the *Journal of Transport and Health*.

Following successful deployment of the data collection instrument and protocol, the research team pivoted to refining and packaging the data collection toolkit as the Qualitative Pedestrian Environments Data (QPED) toolkit. The toolkit has been downloaded by practitioners and researchers across a variety of public- and private-sector agencies and firms. Finally, the research team used insights from our extensive reviews of academic literature on measurement of walking environments to write a scoping review detailing how existing walkability surveys ask about social elements of walking environments. This paper was published in *Health and Place* in 2021.

The research team is hopeful that the QPED Toolkit, our draft survey, and our review article on measurement of social environmental factors in walkability research will aid future researchers and practitioners and help increase understanding of how we can collectively support more walkable environments across socioeconomic and sociocultural contexts.

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APPENDIX A

Open access article based on initial pilot study in Tucson/Pima County, Arizona: "Differences in social and physical dimensions of perceived walkability in Mexican American and non-Hispanic white walking environments in Tucson, Arizona" in *Journal of Transport and Health.*

Differences in social and physical dimensions of perceived walkability in Mexican American and non-hispanic white walking environments in Tucson, Arizona

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ABSTRACT

Introduction: Physical activity patterns within the U.S. vary greatly across ethnicity, with data generally indicating lower rates among Hispanic/Latino adults. At the same time, Hispanic/Latino pedestrians face higher rates of injury and fatalities. Despite the importance of supportive physical activity environments on both health and safety outcomes, limited attention has been paid to ethnic or cultural differences in perceptions of supportive environments for walking. To fill this gap, we explore differences in physical and social environment contributors to perceived walkability between pedestrians in predominantly (> 70%) Mexican American and predominantly non-Hispanic white areas in Tucson, Arizona.
Methods: In early 2017 the research team conducted brief on-street intercept interviews with pedestrians (N = 190) to learn about the environmental attributes associated with pedestrian perceptions of walkability. Study locations were matched for similar physical walkability metrics, income, and poverty rates. Consensus-based thematic coding identified 14 attributes of the built and social environment that contributed, positively and negatively, to perceptions of walkability.
Results: Attributes of the social environment, both positive (i.e., social interaction, social cohesion, and community identity) and negative (i.e., crime/security), were more frequently expressed as components of walkability in Mexican American study areas while physical environment attributes (i.e., infrastructure, street crossings, and aesthetics) were more frequently mentioned in non-Hispanic white areas.
Conclusions: Contributors to perceived walkability in non-Hispanic white study areas were largely consistent with existing built environment-focused walkability metrics. Differences seen in Mexican American areas suggest a need to better understand differences across populations, expand the construct of walkability to consider social environment attributes, and account for interactions between social and physical environments. Results highlight the need for collaboration between public health and planning professionals, to evaluate walkability using culturally relevant measures that account for the social environment, particularly in Mexican American and other communities of color.

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1. Introduction

Health benefits of walking and physical activity, including lower risk of heart disease, stroke, several types of cancer, type 2 diabetes, hypertension, obesity, and improved maintenance of cognitive function, are well-documented (Hardman and Stensel, 2009; Moore et al., 2016; Weuve et al., 2004; Woodcock et al., 2009). Disparities exist, however, in levels of physical activity and the associated health and safety outcomes of walking across the population. Socioeconomically disadvantaged and racial/ethnic minority populations are, for example, less likely to meet recommended levels of physical activity (USDHHS, 2015), though this varies within subgroups and by type of physical activity, including transport, leisure, and occupational (Arredondo et al., 2016). Hispanic/Latino adults are also more likely to be injured or killed while walking than higher income earners and non-Hispanic whites (CDC, 2013). Environmental factors help to explain these disparities. Of the various environmental factors linked with walking, physical activity, and related health and safety outcomes, most attention—in both practice and research—has been paid to attributes of the physical environment (Stangl, 2011). These include the presence or lack of sidewalks and other supportive infrastructure (Kärmeniemi et al., 2018), sufficient nearby destinations (King et al., 2015), transit availability (Saelens et al., 2014), proximity to parks and open space (Sugiyama et al., 2010), and inequitable distribution of infrastructure that results in fewer supports for walking in lower-income areas and communities of color (Neckerman et al., 2009; Sallis et al., 2011; Lowe, 2016).

Less attention is typically paid to aspects of the social environment. For example, a survey of 53 pedestrian plans in the United States identified 17 plan elements related to walkability (Stangl, 2011). Just two of these elements, security issues and the provision of places for socializing, were related to the social environment; these elements were found in fewer than one in three of the pedestrian plans reviewed. While the built environment is clearly a critical component of walkability, built environment-only approaches for assessing neighborhood walkability, or a failure to recognize how social and physical dimensions may interact, can result in investments that fail to address underlying barriers in a community that are preventing residents from walking. In such a situation this may lead to a disconnect between city and community priorities and, especially in areas where residents are concerned about gentrification and economic displacement, may result in a sense that such investment is being made for future residents (Adkins et al., 2017; Danley and Weaver, 2018; Lubitow and Miller, 2013).

Socioecological models of behavior provide a useful conceptual framework for recognizing that characteristics of neighborhood physical environments are just one of many interacting factors. Other factors include characteristics and constraints related to families and households, policies, and elements of the social environment (Sallis et al., 2006). These layers of environmental influence help to explain why standard physical environment-focused measures of walkability, and their usefulness for predicting behavior, may vary across socioeconomic and sociocultural contexts (Adkins et al., 2017; Day, 2006; Frank et al., 2008; Sallis et al., 2009; Serrano et al., 2018). A review of studies from the fields of public health, planning, and transportation showed that the effect of a walkable physical environment on walking and physical activity was about half as strong for low-income, people of color, and those with lower educational attainment than for relatively socioeconomically advantaged groups (Adkins et al., 2017). Some of this discrepancy may be due to the acknowledged, yet often overlooked, role of the social environment. Better understanding these differences across socioeconomic and sociocultural contexts was one of the primary motivations behind the research presented in this paper.

Social environment elements can have both direct effects on perceptions and behavior related to walking as well as important interactions with the physical environment. These interactions include built environments that facilitate social connectedness (Kaczynski and Glover, 2012), social supports that get people to take advantage of walkable environment (Beenackers et al., 2014), and high crime rates that may keeps people from benefitting from a supportive physical environment. As Forsyth (2015) observes, some social attributes may be outcomes of places that are physically more walkable due to the activities and interactions fostered.

Elements of the social environment relevant to walking and physical activity include socioeconomic status, social support, social networks and interaction, social cohesion, social capital, community identity and belonging, racial discrimination, safety and security, and neighborhood disorder (Dadpour et al., 2016; Hystad and Carpiano, 2010; McNeill et al., 2006). Social cohesion and social networks appear to be particularly influential with regard to physical activity in low-income and ethnic/racial minority populations (Forrest and Kearns, 2001; Pabayo et al., 2014; Shelton et al., 2011). Strong community and social ties may, in part, be a response to challenges facing impoverished communities (Forrest and Kearns, 2001; Swaroop and Morenoff, 2006). In Hispanic/Latino communities, sociocultural advantages like trust, reciprocity, and large, close-knit, and proximal social and family networks may contribute to better health outcomes than would be predicted by socioeconomics and indicators of neighborhood disorder (Cagney et al., 2007; Eschbach et al., 2004; Ribble et al., 2001; Ruiz et al., 2016).

The aim of this paper is to understand the degree to which physical and social environment attributes contribute to perceptions of walkability in two different contexts: predominantly Mexican American and predominantly non-Hispanic white areas of Tucson, Arizona. The research team decided that qualitative methods (i.e. interviews and focus groups) were best-suited to explore of this question because they allowed us to reconsider possibly biased expert assessments and established walkability metrics to instead learn from, and in the words of, pedestrians and their lived experiences in our study areas. To do this we conducted and analyzed 190 on-street interviews with pedestrians in predominantly Mexican American study locations and a comparison group of predominantly non-Hispanic white locations selected to have similar physical environment conditions.

1.1. Study setting

Tucson presents a fitting context for exploring how elements of the physical and social environment contribute to perceptions of walkability in predominantly Mexican American areas. Tucson is located about 70 miles from the U.S./Mexico border and has a

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population that is 42.7% Hispanic/Latino, of which 90% are of Mexican ancestry (USDHHS, 2015). Many of the predominantly Mexican American areas of the region are clustered on the south and west side of the city and in the independent City of South Tucson. The state of Arizona and Tucson consistently have among the highest pedestrian fatality rates in the U.S. (Locke, 2014; Retting, 2018). The disparity in pedestrian fatalities between high and low-income Census tracts in Tucson from 2008 to 2012 was 1.6 times greater than the disparity observed nationally (Maciag, 2014). The fatality rate in Tucson's highest poverty neighborhood—which overlap with many of the regions majority Hispanic/Latino areas—was 3.4 times higher than the rate in the lowest poverty census tracts.

The historical context of Tucson is also relevant. Tucson was part of Mexico until 1854. Over the subsequent 100 years, traditionally Mexican parts of central Tucson were subject to intentional neglect and, by the 1950s and 60s, demolition and clearance through urban renewal. Leading up to this period, a city-led modernization effort in the 1930s and 1940s built sidewalks and curbs, which resulted in the removal of trees, shrubs, and informal gathering places, altering the character and "lived-in" feel of neighborhoods (Otero, 2010, p. 100). Following this imposed and largely unwanted modernization, another period of neglect and disinvestment helped to justify classification of the area as a slum and hasten its destruction through urban renewal in the 1960s. This history has not been forgotten by residents and was mentioned in several of the focus groups that preceded our on-street interviews (Ingram et al., 2017).

2. Methods

We selected seven interview sites in areas that were either predominantly (> 70%) Hispanic/Latino or non-Hispanic white. Others have used a 60 percent threshold, but given the racial/ethnic distribution of the population in Tucson we found 70 percent to be a more meaningful criterion. Other site selection criteria were: the presence of a commercial strip or other pedestrian activity generator, similar built environments (i.e., network density, sidewalk coverage, Walk Score), at least a moderate amount of pedestrian activity (based on field visits), and similar median household incomes and poverty rates (Table 1). At each study location, we identified a several block area in which interviews were conducted. Approximate study locations are shown in fig. 1.

2.1. Data collection

We developed an interview guide and protocol for conducting brief on-street intercept interviews with people walking in the study locations. This approach was informed by initial walking focus groups in adjacent neighborhoods, which suggested the need for a method that could capture the breadth of issues relevant to walkability in an open-ended manner and reach a broader cross-section of people than could attend a multi-hour focus group. Most of the analysis, including our identification of environmental attributes, presented in this paper are based on our coding of responses to the following open-ended prompts:

- What are some things you like about this area as a place for walking?
- What are some things you do not like about this area as a place for walking?

The research team also looked for patterns between these items and responses to a prompt about what respondents thought the most important thing the city should do to make the area a better place for walking.

We chose not to use the word "walkability" in these prompts, as this term may hold different meanings for different people, especially across sociocultural and linguistic contexts. The intent of these questions, however, was to get people talking about specific elements of the environment that contributed to an overall sense of walkability, which we define broadly as a place that it suitable for or conducive to walking.

In addition to these open-ended questions, the interview guide included items about race/ethnicity, age group, and purpose of the intercepted walking trip. We also included items asking about vehicle ownership/access, and several items asking respondents to rate various aspects of the area on five-point scales:

Table 1
Characteristics of adjacent Census Block groups.

	Median HH Income	Poverty Rate	Walk Score	Hispanic/Latino
Mexican American Locations	*$28,410*	0.29	67	0.85
Location 1	$32,649	0.28	44	0.79
Location 2	$21,964	0.38	75	0.83
Location 3	$31,525	0.27	78	0.88
Location 4	$27,500	0.24	70	0.88
Non-Hispanic White Locations	$31,791	0.31	71	0.18
Location 5	$31,072	0.27	77	8%
Location 6	$32,401	0.28	63	25%
Location 7	$31,900	0.39	74	22%
City of Tucson	$37,973	0.27	42	0.43

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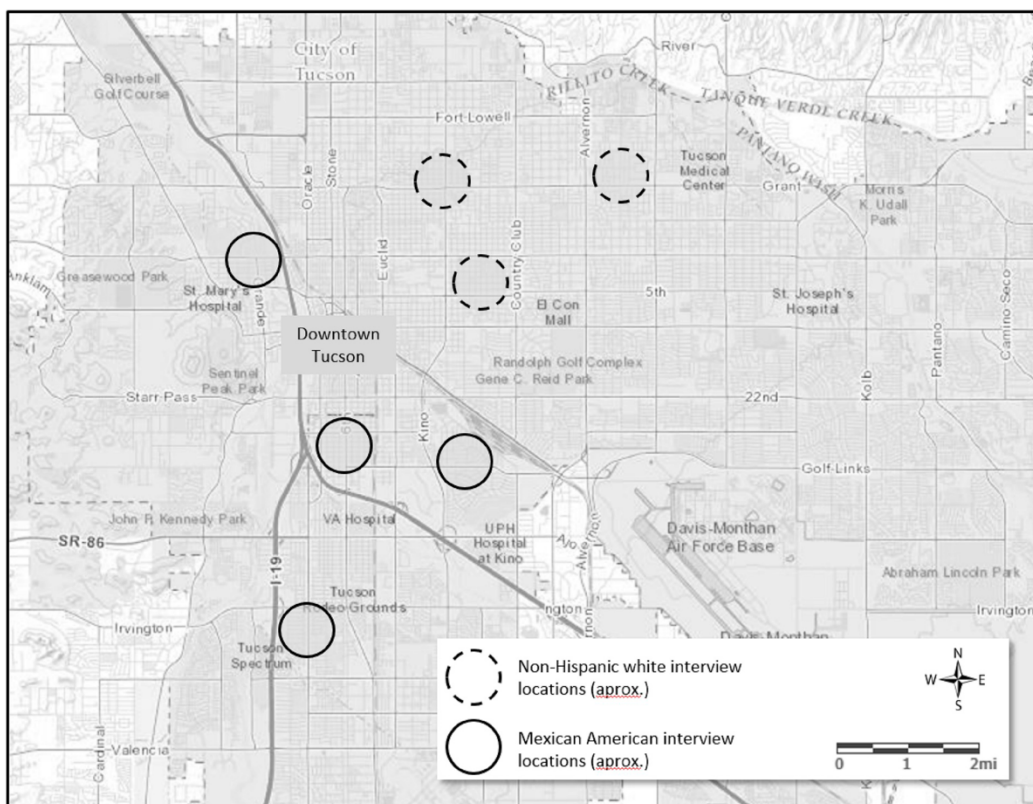
Fig. 1. Map showing distribution of approximate study locations around Tucson.

- How would you rate this area as a place for walking?
- How safe do you feel walking in this area during the day?
- How safe do you feel walking in this area at night?
- How satisfied are you with the selection of businesses or services that you can walk to in this area?

These scale-based rating items replaced additional open-ended items following our initial piloting of the instrument due to concerns about interview length and redundancy of responses to the first three open-ended items. Data collection protocols, instruments, and consent language were approved by the institutional review board at The University of Arizona.

The research team conducted on-street intercept interviews in English and Spanish over two months in early 2017. A team of graduate students, research faculty, and staff from a local community organization were trained to conduct interviews. Interviews in all neighborhoods were conducted by the same bilingual team of trained interviewers. Interviewers always went into the field in groups of at least two, with a fluent Spanish speaker always present. The team included fluent native Spanish speakers, non-native fluent Spanish speakers, Mexican Americans, non-Hispanic whites, and men and women.

Participants were recruited at the time of the interview using a consecutive sampling strategy. The only selection criteria was that participants had to be adults (18+) walking in public in the study area. Interviewers were trained, in order to limit selection bias, to approach the next pedestrian they saw after finishing their notes from the previous interview. Interviews were conducted at different times of day (only during daylight hours) and on weekdays and weekends. Interviewers explained the purpose of the research, read a verbal consent script, and left each respondent with a flyer that included additional information about the study and contact information. No identifiers such as name or address were collected from respondents. The research team decided against using audio recorders given the brief, on-street nature of the interviews and concerns that they could be considered intrusive or make participants uncomfortable or reluctant to participate. This meant that interviewers had to take notes during the conversation. Notes were completed (i.e. informal shorthand notations were spelled out) immediately after each interview while conversations were fresh in interviewers' minds. Whenever possible, verbatim responses were written down and identified as direct quotations. Interviewers entered their notes into a secure web-based repository, which was then exported to NVivo for analysis.

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2.2. Analysis

The number of responses (n = 190) made it possible to look for both qualitative and quantitative differences in interview responses between Mexican American and non-Hispanic white study areas. Interviews were analyzed by a team of three researchers with public health and urban planning expertise using consensus-based thematic coding in NVivo 12 (Otero, 2010; Pabayo et al., 2014; Onwuegbuzie and Teddlie, 2003; Patton, 2002). Identification of themes was inductive and data driven and, as such, did not align perfectly with environmental elements identified by previous research. Each interview was coded by at least two members of the research team, which then discussed and came to a consensus on the small number of discrepancies.

For quantitative comparisons, coded themes were exported to Microsoft Excel where the number of interviews coded for each theme was calculated to determine the share of all interviews in which each theme was mentioned. Statistical tests (t-tests) were used to test differences in interviewer responses to the four five-point scale rating items.

3. Results

3.1. Description of respondents

We conducted a total of 190 interviews: 118 from Mexican American study locations and 72 from non-Hispanic white study locations. We observed an overall estimated response rate of 70% based on how many people were approached but declined to be interviewed. Because we only interviewed people who were already walking, we did not expect our sample to be entirely representative of the census block groups surrounding our study locations. However, gender and race/ethnicity in our sample mostly resembled the surrounding census block groups, with the exception of a slight over-representation of non-Hispanic white participants (28% in the sample versus 15% from surrounding block groups) and men (58% in the sample vs. 48% in surrounding block groups) in Mexican American study locations.

There was very little difference between those we spoke with in Mexican American and non-Hispanic white study locations regarding car access (50% versus 47%) or the frequency of walking in the area, with about 80% in each group walking in the area at least a few times per week. The purposes of intercepted trips were also largely similar between interviews in Mexican American and non-Hispanic white interview locations: commuting (47% vs. 49%), errands/shopping (27% vs. 28%), and to or from a bus stop (20% vs. 22%). Most intercepted trips were utilitarian (i.e. for transport to or from a destination), though participants in Mexican American interview locations were more likely to be walking for utilitarian purposes (87%) than those in non-Hispanic white locations (78%). Those we spoke with in Mexican American study sites were more likely than those in non-Hispanic white study areas to be walking to access health care or human services (8% vs. 1%).

3.2. General perceptions

Ratings of satisfaction and safety were generally positive and varied little between Mexican American and non-Hispanic white study locations (Fig. 2). Overall ratings of walking area satisfaction were similar with an average rating of 3.46 out of 5 for Mexican American locations and 3.82 for non-Hispanic white locations (t = -1.07; p = .143). Overall ratings of sense of safety while walking were also similar, with an average rating of 4.18 in Mexican American locations and 4.40 in non-Hispanic white locations (t = -1.50; p = .067). There was little difference in satisfaction with the selection of nearby business and responses were generally positive with 3.89 in Mexican American locations and 3.97 in non-Hispanic white locations (t = .383; P = .351). The only rating that differed significantly between Mexican American and non-Hispanic white interview locations was perceptions of safety at night, with a rating of 2.65 in Mexican American locations and 3.13 in non-Hispanic white locations (t = -2.26; P = .013).
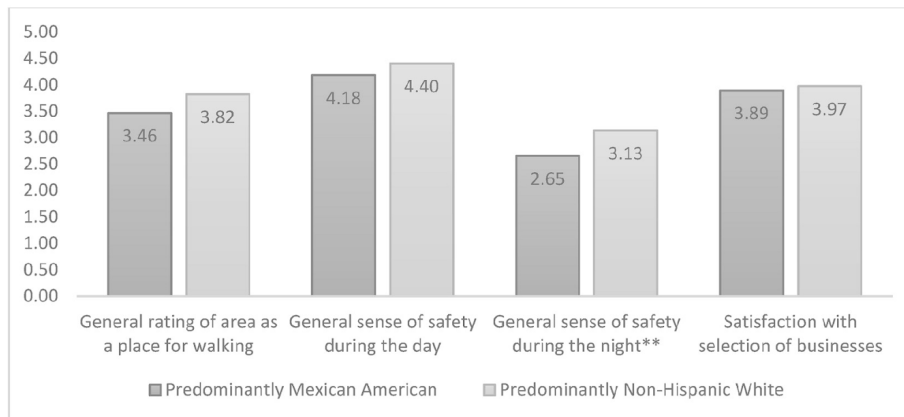

Fig. 2. General perceptions of walking environments (** indicates sig. with p-value < .0.05).

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3.3. Elements of perceived walkability

The research team identified 15 environmental elements based on our coding of responses to the open-ended questions about positives and negatives of walking environments. These were categorized into positive physical environment, negative physical environment, positive social environment, and negative social environment (Table 2). Negative aspects of the physical environment were: lack of upkeep/maintenance, lack of lighting, lack of sidewalks, lack of street crossings, and lack of shade/trees. Positive physical environment contributors were: destinations (e.g., stores, shops, restaurants, schools, parks, etc.), supportive infrastructure (e.g., sidewalks and paths), and aesthetics. There were three primary dimensions of the social environment coded as positive contributors to walkability: social interaction, community identity, and social cohesion. Elements of the negative social environment were crime/security and loose/aggressive dogs. A final positive contributor, calm and quiet, contained elements of both the physical and social environment and is therefore categorized as a hybrid.

3.4. Positive social environment

Interviews conducted in Mexican American study locations were more likely to include elements of the social environment as contributing to the location being walkable (Fig. 3). In Mexican American locations, 30% of respondents mentioned either social interaction, social cohesion, or community identity as contributing to perceived walkability, compared with 6% of interviews in non-Hispanic white locations. Social interaction and community identity were the second and third most frequently cited positive contributors in Mexican American locations (19% and 17% of interviews, respectively). In non-Hispanic white locations, social interaction was the least mentioned positive contributor (6% of interviews), while sense of community and social support were not mentioned at all.

In addition to the stark difference between Mexican American and non-Hispanic white study locations in how frequently elements of the social environment were mentioned as contributors to a good walking environment, there were also noticeable differences in *how* they were referenced. Mentions of social interactions in non-Hispanic white study locations were generally brief and non-specific references to seeing people, "familiar faces," or neighbors being described as "considerate" or "friendly." This contrasted with more specific and enthusiastic responses in the Mexican American locations. For example, "people are friendly, everyone knows everyone" and "I enjoy the people I run into and the culture of the area, I meet my friends and new people on the street, we are Hispanic, we start to talk." Others specifically mentioned Mexican culture and its role in neighborhood history, including music, food, and a sense of shared identity. One respondent answered, "the history and Mexican culture; people have lived here for centuries."

Social cohesion was only mentioned in Mexican American study locations and was most commonly discussed in terms of neighbors looking out for each other. For example, one respondent told us: "people thank me for watching over the neighborhood and the kids ... they call me the watchdog." This was echoed by others who stated that people help and look out for each other. One respondent, in Spanish, connected this to her perception of safety, saying, "it's safe here; the neighbors look after each other." Another talked about people looking out for eachother before adding, "it's a tight knit community and I feel involved."

Calm and quiet, which has elements of both the physical and social environment, was the only environmental attribute with a social connotation that was mentioned more frequently in non-Hispanic white locations than Mexican American locations (44% of interviews versus 2%). Calm and quiet was generally described with words like calm, quiet, tranquil, or peaceful.

3.5. Negative social environment

Fear of crime and concerns about security were more frequently mentioned as having a negative influence on perceived walkability among those in Mexican American study locations, with these issues being raised in about half of interviews compared to 14% of interviews in non-Hispanic/white locations. The ways people talked about crime and security were largely similar, however. The most common security-related concerns raised in multiple interviews in both Mexican American and non-Hispanic white study locations were the presence of drug users and dealers, people asking for money, concerns about prostitution, and homeless people. Most concerns were based on general perceptions or second-hand accounts, but several interviews recounted things that happened first hand or to their children. Stray, loose, or aggressive dogs were mentioned as a negative in 7% of interviews in Mexican American locations and none of the interviews in non-Hispanic white locations.

Table 2
Coded attributes of walking environments.

	Positive	Negative
Physical Environment	Destinations	Lack of upkeep/maintenance
	Supportive infrastructure	Lack of lighting
	Aesthetics	Lack of sidewalks
		Lack of street crossings
		Lack of shade/trees
Physical/Social Hybrid	Calm and quiet	
Social Environment	Social interaction	Crime/security
	Community identity	Loose/aggressive dogs
	Social cohesion	

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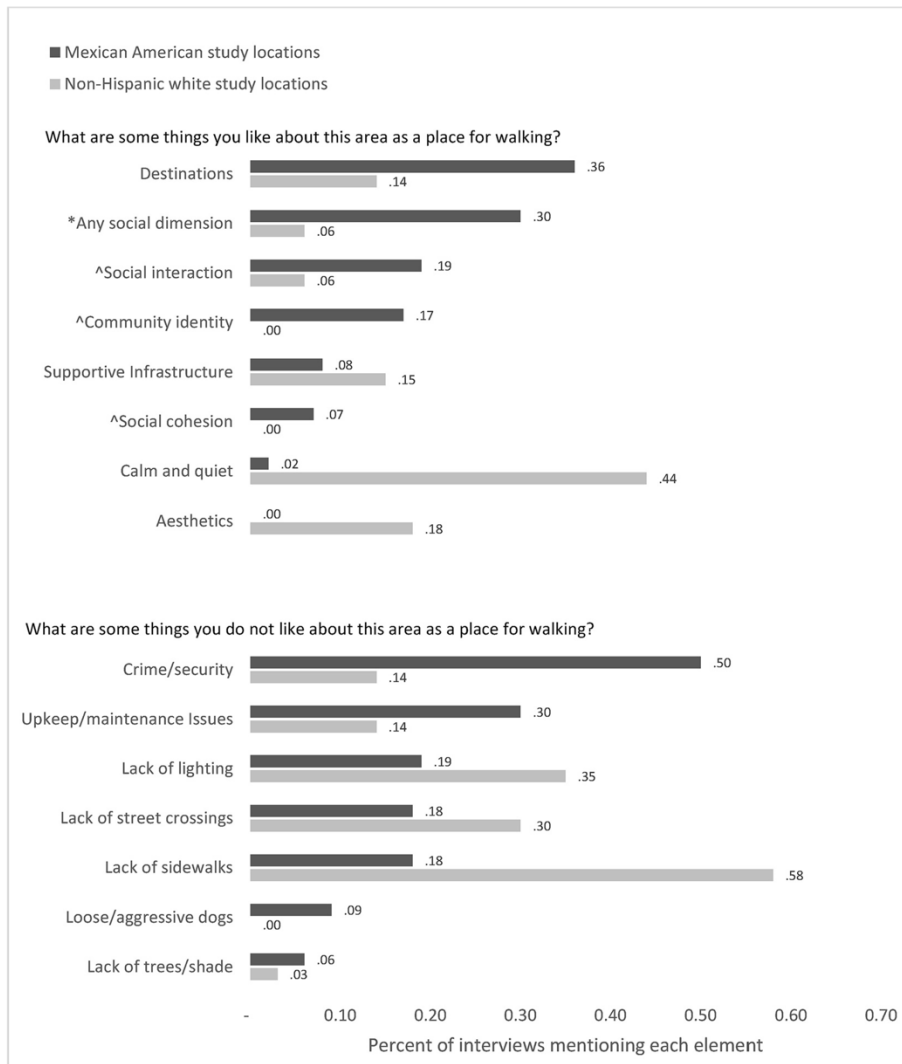
Fig. 3. Percent of interviews coded for each element of perceived walking environment (ordered by share of interviews in Mexican American locations) Note: Any social dimension is a parent theme that includes (^) social interaction, social cohesion, or community identity, which are also displayed individually.

Just one respondent mentioned police making an area better for walking, so police were not coded as a positive or negative attribute. Police were more frequently mentioned in response to our follow up question about what the city could do to make an area a better place for walking. These mentions of police were confined to Mexican American locations and mostly focused on the need for either more or better policing. The need for more police was mentioned in 19% of interviews in Mexican American locations. However, another 7% of respondents in Mexican American locations talked about police being present, but not addressing residents' concerns related to walking. For example, one stated "I never see police patrolling traffic." Others spoke of the police that were present needing to be more attentive. "Police know where the problems are, but don't do anything," complained one respondent. Another described a "high police presence already" but said that to improve walkability the city should put in blue light emergency call boxes like she had seen on university campuses. Another said, after listing several crime related issues that needed addressing, "police can't help." "More policing" and "trust in police from the neighbors" were mentioned together by another pedestrian. Two respondent mentioned police profiling or harassment as a problem in terms of perceptions of walkability.

3.6. Physical environment

The physical environment tended to be referred to in negative terms in both Mexican American and non-Hispanic white locations. But despite similar built environments, those we interviewed in non-Hispanic white locations were three times as likely to raise lack of sidewalks as a negative (58% versus 18%). This pattern of physical environment characteristics being more frequently mentioned in Non-Hispanic white locations also held true, though to a lesser extent, for deficiencies in lighting (35% versus 19%) and street crossings (30% versus 18%).

Two elements of the physical environment were more frequently mentioned in Mexican American study locations. Despite having similar Walk Scores and satisfaction with the selection of nearby businesses, and a similar distribution of trip purposes, destinations within walking distance were mentioned as a positive element of walkability by 36% of participants in Mexican American locations versus 14% in non-Hispanic white locations. Lack of upkeep and maintenance was also mentioned in twice as many interviews in Mexican American locations (30%) as non-Hispanic white locations (14%). These physical environment elements were however, often talked about as physical manifestations of positive and negative attributes of the social environment. For example, destinations, such as local restaurants and shops, were also seen as important symbols of community and maintenance and upkeep issues were seen as a reflection on the community.

We also saw evidence in Mexican American study locations that the pedestrians we spoke with may be resigned to the physical conditions of their neighborhoods and frustrated by patterns of disinvestment and neglect. When asked if there was anything the city could do to make her neighborhood better for walking, one respondent said [translated from Spanish] "No … because what one asks of them they don't do." In a different Mexican American neighborhood, a respondent said, "The city doesn't worry about this area … They don't care about us here, unless it's for their own good, for special events to make people think it looks nice all the time along the major street." In response to the question about what the city could do, one respondent answered pointedly, "their jobs." Others simply answered this question with responses like: "not much you can do," "that's a tough one," or simply a shrug and a "no," despite the same people having just raised numerous issues in response to the question about what they did not like about their neighborhood as a place for walking or what could be done to improve the area for walking. We did not observe a similar pattern in non-Hispanic white areas.

Aesthetic characteristics of the walking environment were mentioned as a positive contributor in 18% of interviews in the three non-Hispanic white study locations, with comments like "it's a beautiful neighborhood," "it's pretty here," and "I love looking at the houses." Aesthetics were sometimes linked to the concept of calm and quiet, for example one man stated: "It's beautiful here. I love the architecture, so eclectic. It's nice and mellow." In another neighborhood several people mentioned that they enjoyed a community-oriented public art installation. According to our interviews, aesthetics did not appear to be linked with perceptions of walkability in Mexican American study locations.

4. Discussion

This study makes a unique contribution to the growing body of research on characteristics of spaces for walking and physical activity by highlighting differences in how pedestrians in Mexican American and non-Hispanic white sociocultural contexts perceive walkability. Despite similar physical environments, economic conditions, and ratings of overall walkability and safety, key qualitative and quantitative differences emerged in how respondents talked about environmental contributors to walkability. The environmental contributors to perceptions of walkability in the non-Hispanic white interview locations were largely consistent with standard physical environment-focused definitions and measurement tools used in practice by planners and urban designers. Often overlooked elements of the social environment, both positive and negative, were more likely to contribute to perceptions of walkability in Mexican American contexts.

There are several possible explanations for the differences we found between those we talked to in Mexican American and non-Hispanic white areas. Consistent with previous research, there may be more social interaction, social cohesion, and community identity in Mexican American neighborhoods (Eschbach et al., 2004; Ruiz et al., 2016). The role of positive attributes of the social environment may help a community overcome concerns about crime/security (Forrest and Kearns, 2001). Regardless of whether these positive social environment attributes are simply more prevalent in these locations or a response to other factors, it is an important finding that respondents in Mexican American study locations were, without prompting, associating these attributes directly with perceptions of walkability. In this context, social interactions, social cohesion, and community identity are not simply outcomes of a walkable place, but appear to also play an important role in framing perceptions of walkability.

Another important pattern that emerged from the interviews is that fewer mentions of the physical environment in Mexican American study areas may be due to feelings of resignation to the status quo. Community knowledge of both current and historical neglect and disinvestment may amplify this sentiment. This suggests that deeper knowledge—such as that gained through our on-street interviews and initial focus groups—is necessary to separate expectations from preference. Many common strategies for public engagement (e.g., public meetings and community surveys) may overlook this nuance and mis-identify neighborhood priorities. The same may be true for policing where a conclusion that more police are necessary may miss the more nuanced view that police are not focusing on issues most relevant to the community.

Our findings are consistent with evidence that traditional definitions and measures of walkability may be biased due to their development and validation in non-Hispanic white contexts (often by non-Hispanic white researchers and decision-makers) or in ways that have controlled for, but not explored socioeconomic and sociocultural context (Adkins et al., 2017). Standard approaches to measuring walkability may, therefore, simply be more closely aligned with preferences in non-Hispanic white contexts. At least in our study locations, implementing improvements based on what we heard in one context would very likely lead to a mismatch with the perceptions and priorities in another. More research is needed to determine whether these patterns exist beyond our study locations in Tucson.

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One implication of our findings that needs further study is the degree to which the social environment dimensions of walkability identified in this study persist in Mexican American areas undergoing significant economic displacement and neighborhood change. As social cohesion, existing social networks, and culturally significant destinations diminish due to displacement, so might important social environmental supports and protective factors that facilitate walking and physical activity (Fullilove, 1996; Garcia, 2018). More research using similar methods is needed in other contexts, including in other racial/ethnic minority communities and in areas in different stages of gentrification.

4.1. Limitations

By focusing on those already walking in their neighborhoods, we are limited in what we can conclude about increasing walking among those not currently walking. Our study shows, however, that learning from the lived experience of pedestrians and improving conditions based on their insights has potential to help jurisdictions improve conditions for the benefit of those currently walking. It is likely that doing so would have the co-benefit of getting more people walking.

Our relatively small sample of study locations and the imperfect nature of our matching for objective walkability, including not having a match for the one Mexican American study location with a lower Walk Score, should also be considered as a limitation. There may also be elements of the objective built environment that we were not able to capture which could be confounding our results (e.g. streetlighting lighting coverage). We also have not reported responses by the race/ethnicity of the individuals being interviewed, but rather by the racial/ethnic makeup of the study location. Future research could examine differences in responses based on the race/ethnicity of individuals relative to the racial/ethnic makeup of the study area.

The tendency of our method to highlight topics most salient to respondents represents both a strength and a limitation of our study design. Because we collected data through brief on-street interviews, those we spoke with were likely sharing the most salient issues related to walking in their neighborhoods. Therefore, it is likely that, at least to some degree, the more frequent mentions of social environment characteristics (positive and negative) in Mexican American locations simply left less time to talk about other matters. We can clearly say that social environment characteristics appear to have greater salience or priority, relative to physical characteristics among those we talked to in Mexican American locations. However, we cannot say that, given a longer interview or specific prompts about physical and social characteristics, there would not be a more even distribution.

Finally, as in any research, there is potential for bias based on the backgrounds and perspectives of the research team. Research design, data collection, analysis, and manuscript writing were carried out by a multi-disciplinary team that included both non-Hispanic white and Mexican American faculty, students, and community organization staff, including some with family connections to neighborhoods in the study. In order to minimize the potential bias from any one perspective, care was taken to include multiple perspectives in every stage of the research presented in this paper.

5. Conclusion

In both research and practice, walkable places continue to be thought of largely from a physical environment perspective, despite a growing body of research highlighting the important role of the social environment. In the context of Mexican American areas of Tucson Arizona, we see evidence that standard approaches to improving walkability would likely not address key barriers or leverage existing community strengths. Even in places where physical improvements such as infrastructure are needed to address safety and comfort related deficiencies, such investment should be viewed in the context of the social environment and implemented as part of a more holistic approach. These findings suggest that, at least in this context, community-based transportation programs like Safe Routes to School, open streets events (e.g. ciclovia), organized neighborhood walking groups, and broader efforts aimed at non-transportation specific community development, upkeep and maintenance, and community-oriented placemaking strategies may be especially important as strategies for facilitating walking and physical activity. These more holistic approaches require cross-disciplinary and cross-sector collaboration, which the fields of public health and planning are well-equipped to facilitate.

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