

ACCESS TO PHYSICAL ACTIVITY IN LOW-INCOME COMMUNITIES AND  
COMMUNITIES OF COLOR

A Dissertation

by

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## ABSTRACT

Increasing access to physical activity opportunities is associated with positive change in youth physical activity behavior and many additional individual, social, economic and environmental benefits for the communities involved. This dissertation has three aims:

1. Identify examples and suggest best practices for increasing access to physical activity in low-income communities and communities of color. The method chosen is a systematic literature review into three databases. The use of an ecological framework for sustainable community-level health change, Active Living by Design, will guide the analysis.

2. Identify all facilities within Pasadena, TX that currently provide an opportunity for active recreation, sport, and other forms of physical activity, and display this information in an asset map. Geospatial analysis will be used to identify facilities and create the asset map. Additional information will be added to map from a facility level survey, described in aim three.

3. Determine facilitators and barriers, and other key issues, relevant to sharing facilities with the public for the purposes of active recreation, sport, and other forms of physical activity in Pasadena, TX. To elicit this information, an online survey will be distributed to the facility administrators of each respective location within Pasadena. Results will be gathered, analyzed, and disseminated to community partners.

In response to the first aim, only 13 cases demonstrate success in increasing access, suggesting that more can be done to address inequalities in physical activity opportunities. Of the existing efforts, few utilize crucial components to create a sustainable change in the community. For the second aim, findings from mapping all facilities in Pasadena, TX illustrate inadequate access to places for physical activity that were open, developed, and in good condition. Lastly,

for the third aim, there were trends in facilitators to shared-use showing a willingness and interest in sharing facility space with the community. Concerning barriers to shared-use, findings were similar to national studies in the types of challenges faced by facility administrators including staffing, liability and cost. Utilizing formal shared-use agreements may help address the barriers surrounding liability, misuse of facilities, insurance, and maintenance; concerns expressed by facility administrators.

## DEDICATION

To my mother, your sacrifice has let my light shine.

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# CHAPTER I

## INTRODUCTION

While obesity rates have remained fairly stable, it remains a health concern for youth and adolescents with 31.9% at or above the 85<sup>th</sup> percentile of the BMI-for-age growth charts (Ogden, Carroll, & Flegal, 2008; Wang, Monteiro, & Popkin, 2002). Obesity within adolescence is associated with a myriad of adverse health effects such as an increased risk for type 2 diabetes, elevated blood pressure, asthma, psychological disorders, and is likely to lead to adult obesity (Rubin et al., 2008; Scott et al., 2008; Wyatt, Winters, & Dubbert, 2006). Physical activity however, has an inverse relationship with BMI (Reichart, Menezes, Wells, Dumith, & Hallal, 2009). To confront the obesity epidemic and to receive all of the associated benefits of physical activity, national recommendations suggest children and youth ages 5-17 accumulate 60 minutes per day of at least moderate level intensity physical activity (Janssen & LeBlanc, 2010). However, as children get older, there is a negative trend with physical activity, especially for females (Belcher et al., 2010). Physical activity can also be predictive of adult physical activity behavior, making it crucial for early development of physical activity for youth and consistent levels as youth age (Telama et al., 2005).

The promotion of physical activity for youth can be complex as there are several barriers spanning across the ecological model of behavior; personal, social, and physical environmental factors (Sallis & Owen, 1998). In order to be successful, efforts to increase youth levels of physical activity must address factors at all levels (Baranowski, Anderson, & Carmack, 1998). A recommended approach by the Community Preventive Services Task Force is to increase access

to parks, green space, and a built environment conducive for physical activity (Bedimo-Rung, Mowen, & Cohen, 2005). Access to physical activity can be described as changes to local environments that create new opportunities for physical activity or reduce the cost of existing opportunities (Briss et al., 2000). Increasing access to physical activity opportunities is associated with positive change in youth physical activity behavior and many additional individual, social, economic and environmental benefits for the communities involved (Roemmich et al., 2006; Kahn et al., 2002).

Though access is an overall concern for the general population, it is especially problematic for ethnically diverse and low-income communities with lower levels of actual and perceived access to safe environments for physical activity (Powell, Slater, & Chaloupka, 2004; Wolch, Wilson, & Fehrenbach, 2005; Wilson, Kirtland, Ainsworth, & Addy, 2004). Many communities with a predominance of ethnic minority populations tend to be located in crowded urban areas where access to physical activity places such as parks and green spaces is limited (Williams & Collins, 2001). Other barriers include broken or uneven sidewalks, inadequate time in recess, high crime levels, and unsafe streets (Taylor & Lou, 2011). Over time, a lack of environmental supports for physical activity negatively alters low-income communities' perception of access to safe facilities and impacts physical activity levels (Wilson et al., 2004). In fact, several research studies have attributed differences in socioeconomic status, race and ethnicity, and built environment to be associated with differences in health outcomes (Gordon-Larsen, Nelson, Page, & Popkin, 2006; Gordon-Larsen, Adair, & Popkin, 2003; Mokdad, Ford, & Bowman, 2003). Though increasing access to physical activity is only a small step toward addressing the overall health disparities experienced by communities of color, it is an area of research that is highly

recommended by both the Robert-Wood Johnson Foundation and National Institutes of Health (Robert-Wood Johnson Foundation, 2004; U.S. Department of Health and Human Services, 2001).

Efforts to increase access can take various forms such as enhancements in the existing built environment, creation of new facilities, implementing bike and pedestrian plans, temporary street closures, sharing physical activity spaces, physical activity programs in the work, school, and church settings, vouchers for free or reduced access to exercise facilities, and physical activity related challenges (Centers for Disease Control and Prevention[CDC], 2012). Regardless of the method implemented, a crucial component is community engagement and participation in the process used (Israel, Schulz, Parker, & Becker, 1998; Minkler, Blackwell, Thompson, & Tamir, 2003; Goh et al., 2009). Community engagement involves community members at all stages of the research process and allows all partners involved to share the responsibility of addressing the health concern (Jones & Wells, 2007). Ultimately, programs with intentions to increase access for low-income and communities of color must involve the communities of interest to ensure that the community has a voice in, and is able to take advantage of the proposed and desired changes (Wallerstein & Duran, 2006).

While creating new spaces for physical activity is often unrealistic, shared-use of existing school and community sport and recreational facilities can be a cost effective solution to improving the likelihood underserved communities will be more physically active (Spengler, 2012a; Spengler, Connaughton & Carroll, 2011a). Facilities such as schools, public parks, and community recreation centers provide low or no cost opportunities for members of the community to be physically active. However, within many communities, these facilities do not

share their recreational space, or may limit the availability to the general public (Evenson, & McGinn, 2004; Evenson, Wen, Lee, Heinrich, & Eyler, 2010). Sharing physical activity spaces, a Healthy People 2020 objective, is one shared-use method where school recreational facilities are open to the community before, during and after school or work hours, as well as on weekends, holidays and over the summer (Office of Disease Prevention and Health Promotion, 2011). Another shared-use method is to enter into an informal arrangement or utilize a formal contract (shared or joint use agreement) between the facility and another entity including municipalities, nonprofits, or faith-based groups (Young et al., 2014). Identified barriers to shared-use of recreational spaces in lower-income communities and communities of color include liability concerns, insurance, cost of running activities and programs, staffing for maintenance and security, safety concerns, and maintenance costs and responsibilities (Spengler, Connaughton, & Maddock, 2011b; Spengler, Carroll, Connaughton, & Evenson, 2010). These barriers can be addressed at the local level through shared-use contracts or agreements or at the state level through policy and laws with attention to liability outside of normal operating hours (Spengler, 2012a; Spengler, Young, & Linton, 2007).

To date, there has not been a review of the literature regarding all types of efforts to increase access for low-income and ethnic minority youth. Additionally, descriptions of the process taken to engage with community partners in the efforts to increase access are seldom described in the professional literature. For many community-based programs, dissemination of research findings in peer-reviewed health journals is needed to share participatory approaches and their community impact (Bordeaux et al., 2007). This dissertation seeks to better our

understanding of the landscape, and develop a framework to guide lower-income communities and communities of color to improve access to physical activity.



## CHAPTER II

### INCREASING ACCESS TO PHYSICAL ACTIVITY WITHIN LOW-INCOME AND COMMUNITIES OF COLOR: A SYSTEMATIC REVIEW

Over two decades ago, the Centers for Disease Control and Prevention (CDC) established national recommendations for routine physical activity to ultimately enhance quality of life (Pate et al., 1995). In 2008, the Physical Activity Guidelines went beyond the individual level and listed “good access to parks and recreational facilities in neighborhoods” as a community strategy to increase physical activity (Physical Activity Guidelines Committee, 2008). Today, using an ecologic framework (from individual and interpersonal, to community, environments, and policies) is the standard to promote physical activity (Giles-Corti, Timperio, Bull, & Pikora, 2005b; Sallis, Owen, & Fisher, 2015). This approach moves beyond behavioral strategies to focus on environments and opportunities available for individuals to participate in activity. In fact, access to parks, green space, and a built environment conducive for physical activity is associated with many individual, social, economic and environmental benefits, with enhanced access listed as a recommendation by the Community Preventive Services Task Force in The Community Guide (Bedimo-Rung, Mowen, & Cohen, 2005; Kahn et al., 2002).

However, access is not equal across communities, with findings from recent studies showing both economic and racial disparities in access to parks and recreational facilities (Wolch, Wilson, & Fehrenbach, 2005; Abercrombie et al., 2008; Cutts, Darby, Boone, & Brewis, 2009; Wen, Zhang, Harris, Holt, & Croft, 2013). For many urban communities, physical

infrastructure for walking and availability of parks is sparse (Wolch, Byrne, & Newell, 2014). These communities also tend to be areas with predominantly ethnic minorities and residents of low socio-economic status whom historically have decreased levels of overall physical activity and higher risk for diabetes and heart disease (Dutton, Johnson, Whitehead, Bodenlos, & Brantley, 2005; Giles-Corti & Donovan, 2002; Sallis et al., 2011). An example from California demonstrates how insufficient access to physical activity locations including parks, is associated with lower levels of physical activity, and worse health outcomes for teenagers living in disadvantaged neighborhoods (Babey, Brown, & Hastert, 2005; Babey, Hastert, & Brown, 2007; Babey, Hastert, Yu, & Brown, 2008; Babey, Wolstein, Krumholz, Robertson, & Diamant, 2013). Similarly, reports of poor health behaviors and outcomes by African Americans living in public housing, was connected to a lack of awareness of local neighborhood opportunities for physical activity (Eugeni, Baxter, Mama, & Lee, 2011). Focusing efforts on access to physical activity in low-income areas and communities of color may be a promising first step to increase overall physical activity, but also address health disparities.

While several articles discuss the positive associations of access to parks and other recreational facilities for physical activity, few studies describe attempts to increase or enhance access (Abercrombie et al., 2008; Babey et al., 2005; Gomez et al., 2015). This review's purpose is to uncover best practices for increasing access to physical activity by examining efforts used within low-income areas and communities of color. Two questions guide this review (1) Are there existing examples of increasing access to physical activity for low-income areas and/or communities of color? (2) If so, what are the best methods? Although "access" can be broadly defined, this review will conceptualize "increased access" as changes to local environments that

create new opportunities for physical activity or reduce the cost of existing opportunities (e.g., creating walking trails, building exercise facilities, or providing access to existing nearby facilities; Briss et al., 2000).

The theoretical lens used for this study is from the Active Living by Design (ALbD) Community Action Model (Bussel, Leviton, & Orleans, 2009). The ALbD model has shown success in changing environments to be more suitable for physical activity across the United States (Bors et al., 2009). The Community Action Model is an ecological framework with multilevel strategies for increasing active living in communities. The most updated model highlights the importance of a community's context, defines six essential practices and utilizes a 3P approach to action (Partner, Prepare, and Progress). For purposes of this review, the main focus will be the six practices, because they describe how partnerships can guide and sustain meaningful change in a community. The six essential practices are detailed below.

1. Health Equity Focus: An intentional focus on reducing health disparities in communities by eliminating avoidable and unjust health inequities affected by social, economic, and environmental conditions.
2. Community Engagement: An intentional process of empowering adult and/or youth residents to authentically engage in and contribute to the planning and implementation of solutions within their own communities.
3. Facilitative Leadership: A capacity-building and management approach that shares power and influence among engaged partners in order to produce actions and outcomes that are generated by and best serve a group rather than one or two strong or vocal leaders.

4. Sustainable Thinking: A consideration of the social, environmental, and economic assets and opportunities that are necessary for successful and lasting community change.
5. Culture of Learning: Ingrained, ongoing opportunities in a community to improve effectiveness and impact through partnerships, continual assessment of initiatives, and collaborative sharing and learning.
6. Strategic Communication: A goal-driven method of communication that aligns messages and tactics with communities' priorities and audiences' values, recalibrates based on measurable results, and strives for an evolving dialogue.

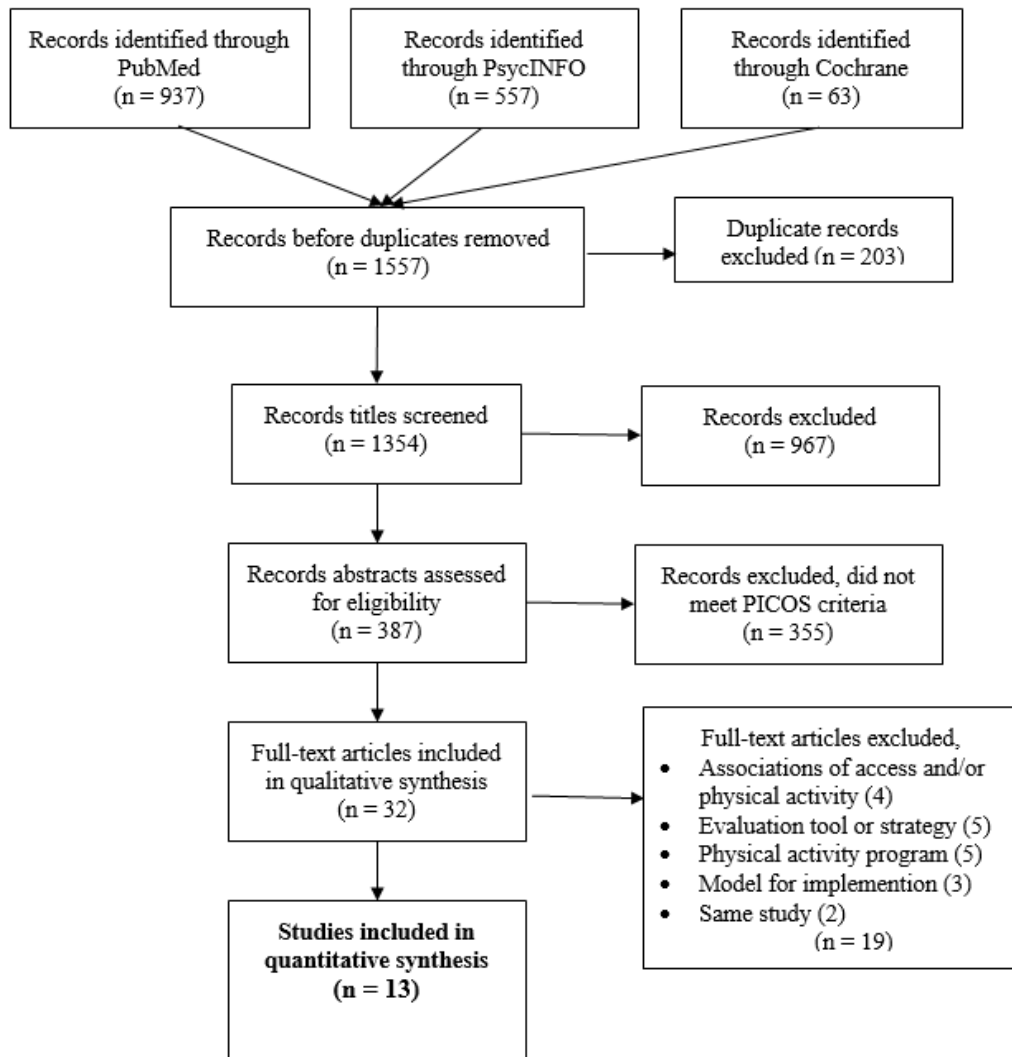
## **Methods**

A two-step process guided the literature search. In step one, three databases (PubMed, PsychINFO, and Cochrane Library) were searched using the Boolean connections and variations of the following key terms access, physical activity, ethnic groups, and socioeconomic factors, (a full list can be found in the appendix). The search retrieved a total of 1557 peer reviewed articles related to an increase in access to physical activity, spanning from 1992 until 2017. All reports were gathered and organized into EndNote X8.

Step two assessed articles by title, abstract, and then full text to determine whether the studies met the inclusion/exclusion criteria guided by the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines, (see Figure 1.1 of the flow diagram) (Moher, Liberati, Tetzlaff, & Altman, 2009). Inclusion and exclusion criteria were guided by PRISMA's Problem, Intervention, Comparison, Outcomes, and Setting (PICOS).

Studies met the inclusion criteria if they: directly addressed access to or opportunities for physical activity, included some variation of an intervention to promote physical activity, compared disparities or inequalities in access, included an outcome related to increased access to or to physical activity levels, and were set in the community. Reports were excluded if they did not have a variation of a physical activity outcome, reported associations of access to the built environment or benefits of physical activity without an intervention, provided only suggestions for a method to evaluate access or performed an assessment of access for one specified location, was a virtual program or only offered in the worksite, a physical activity intervention with sole purpose to assess changes in individual level behavior, described a future intervention, models for designing interventions, or was the same study spliced into multiple articles.

Figure 1.1: PRISMA Flow Diagram of literature search



After excluding articles based on titles, reports were transferred from EndNote to Excel 2016 version, where a review matrix (matrix is not included here for brevity, but can be supplied upon request) was used to abstract the remaining articles (Garrard, 2016). Abstractions included type of study, location of the study, community of interest, the approach used to increase access,

type of physical activity, and the funding sources. Additionally, included articles were categorized by the six essential practices outlined by the ecological framework, ALbD.

## **Results**

Among 1557 total articles, 13 publications made the final sample (Arredondo et al., 2013; Audrey, Wheeler, Mills, & Ben-Shlomo, 2012; Beaulac, Olavarria, & Kristjansson, 2010; Bopp, Fallon, & Marquez, 2011; Candib, Silva, Cashman, Ellstrom, & Mallett, 2008; Keith, Mi, Alexander, Kaiser, & de Groot, 2016; Maddock, Choy, Nett, McGurk, & Tamashiro, 2008; McDonald, Barth, & Steiner, 2013; McNeill & Emmons, 2012; Po'e et al., 2012; Schober, Zarate, & Fawcett, 2015; Speck, Hines-Martin, Stetson, & Looney, 2007; Wilson et al., 2015). Most studies were case reports, with three randomized control trials, two cross-sectional, and one cohort study. Several journals and funding sources comprised the final sample, see Table 1, and they were held mostly in the United States with one study in Canada and one in England.

All studies stated efforts to reach low-income areas and communities of color. Eleven studies specified a low-income or deprived area as the priority community. Six of the studies prioritized Latino, Hispanic, or a Spanish speaking population, and three prioritized an African American population. For the other studies, two focused on a multi-cultural population, one prioritized an Asian and Pacific Islanders' community, and the final study did not specify a priority ethnicity. For a list of the approaches used and the various physical activity outcomes, see Table 1.1.

Table 1.1: Overview of results indicating where studies were published, funding sources, the approaches and physical activity measured, and the 6 Essential Practices

Study	Journal	Funding	Physical Activity Measured	Type of Approach	6 Essential Practices						
					1	2	3	4	5	6	Total
Arredondo et al., 2013	Health Promotion Practice	City Funded, WalkSanDiego	Locality development by youth, <i>promotoras</i> , and community agencies	Park use, intent to use	✓	✓	✓	✓	✓	✓	6
Beulac et al., 2010	Health Promotion Practice	United Way Ottawa	Community-based dance program	Hip hop dance	✓	✓	✓	✓	✓		5
Bopp et al., 2011	American Journal Health Promotion	Sunflower Foundation of Kansas	Faith based health promotion including a walking contest, health fair, and educational information	Walk contest, awareness, knowledge	✓	✓	✓		✓	✓	5
Maddock et al., 2008	Preventing Chronic Disease	Tobacco Settlement, Healthy Hawaii Initiative	Joint use agreement of a recreational physical activity program	Participation, satisfaction, motivation, confidence	✓	✓	✓	✓	✓		5
Wilson et al., 2015	Annals of Behavioral Medicine	National Institutes of Diabetes	Walking program with a social marketing campaign and police patrol	Moderate Vigorous Physical Activity (MVPA), perception, access, walkers attended, trail use	✓	✓	✓	✓		✓	5
Audrey et al., 2012	Public Health	Government Funded	Free swim initiative	Total swims	✓		✓		✓	✓	4
Keith et al., 2016	Progress in Community Health Partnerships	Grant, Partnership, Donations	Community-based fitness center with a free physical activity instructor and classes	Physical activity behavior, self-efficacy, muscular strength, muscular flexibility	✓		✓	✓	✓		4
Schober et al., 2015	Progress in Community Health Partnerships	National Center on Minority Health and Health Disparities	Community-based soccer sessions through an academic - community partnership	Attend soccer sessions	✓	✓	✓		✓		4
Candib et al., 2008	Journal of Ambulatory Care Management	Raised Funds, Partnership	Community - clinical linkage to create open access to exercise referral and gym membership	Use Young Women's Christian Association (YWCA)	✓		✓		✓		3
Speck et al., 2007	Journal of Cardiovascular Nursing	National Institutes of Diabetes & Digestive & Kidney Disease	Activity opportunities at a community center	Steps, physical activity behavior, perceptions	✓			✓	✓		3
McDonald et al., 2013	American Journal of Preventive Medicine	Department of Transportation and Local Matching	Safe Routes to School program	Walking and biking	✓			✓			2
McNeill & Emmons, 2012	Preventing Chronic Disease	National Cancer Institute	Community maps to increase walking	Walking, perception, awareness	✓					✓	2
Po'e et al., 2012	Journal of Childhood Obesity	RWJF, Community Resource	Family centered programing at a community recreation center	Use of community recreation center, perception, access	✓			✓			2



In relation to the ecological framework utilized for this review, all of the studies reached the first essential practice, Health Equity, as it was one of the inclusion criteria. Overall, out of the 13 studies, only one met all six of the essential practices (Arredondo et al., 2013). Below the studies are categorized by the remaining ALbD essential practices (see Intro for full description of each practice, and Table 1 for reference to each study).

**Community Engagement:** Six studies included some level of community engagement to contribute to the planning and/or implementation of efforts. Two studies engaged youth to help in the planning stages (Beaulac et al., 2010), and to lead changes in the community including an effort led alongside *promotoras*, or community health workers, (Arredondo et al., 2013). Creation of a steering committee (Wilson et al., 2015), coalition (Schober et al., 2015), and workgroups (Bopp et al., 2011; Maddock et al., 2008) were also used to lead the access efforts and provide feedback along the way. The majority of the studies did not engage with the community, or did not state in their report how they engaged with the community at any stage of the effort.

**Facilitative Leadership:** Eight of the studies employed some level of capacity building amongst a group of partners ranging from academic entities, community-based organizations or centers, faith based organizations, local residents, and a medical center. These partnerships were instrumental in the design of the program, but were also used to leverage resources to create a sustained effort in the priority community.

**Sustainable Thinking:** Of the eight studies that utilized facilitative leadership, five included a plan for lasting community change. Examples of these plans were to pass a joint use policy (Maddock et al., 2008), generate enough funds to last up to 13 years (Keith et al., 2016), and to engage with local police and elected officials to receive long term buy in (Arredondo et

al., 2013; Wilson et al., 2015). Three other studies included ideas for sustainability, but did not describe efforts to guarantee long term success, such as a plan for how to receive local match of funds (McDonald et al., 2013; Speck et al., 2007) and utilizing an existing community-based resource (Po'e et al., 2012).

**Culture of Learning:** Though all studies provided some level of assessment of its efforts, the other components of this essential practice, such as collaborative sharing and learning, were only met by eight studies. The most common example amongst the eight is training for the community to lead the initiative and sustain through leadership post effort. Other unique forms of sharing and learning included a health fair designed and hosted by the community for the community (Bopp et al., 2011), and a *promotora* mentorship program (Arredondo et al., 2013).

**Strategic Communication:** This practice was the least employed of the six, with only five studies creating and delivering a strategic message as part of the effort and outside of the recruitment and program marketing materials. Two studies were a part of (Audrey et al., 2012), or created their own (Wilson et al., 2015), social marketing campaign. Communications via posters and flyers (Bopp et al., 2011) or presentations to city council and at a local park (Arredondo et al., 2013), were also delivered alongside the interventions. Lastly, a novel approach utilized a visual message through a community map (McNeill & Emmons, 2012).

## **Discussion**

In response to the first research question, ‘are there examples of access efforts?’ this review found 13 efforts to increase access to physical activity in low-income and communities of color. Most of the studies were case reports located in the United States using several different approaches such as changes in the built environment, implementation of a community-based

physical activity program, and creating partnerships to leverage resources. To answer the second research question, ‘what are the best methods to increase access?’ the six essential practices of the ALbD model were chosen as the evaluation framework. This review compared the 13 studies against the model and found that only one study met all six criteria, with only a few reaching more than two criteria at a time. Overall conclusions are twofold: (1) Only 13 cases demonstrate success in increasing access, suggesting that more can be done to address inequalities in physical activity opportunities (2) Of the existing efforts, few utilize crucial components to create a sustainable change in the community.

While all of the studies fit the definition for enhancing access to places or opportunities for physical activity through a multi-component strategy (Briss et al., 2000), the shortcomings illustrated by comparing them to ALbD essential practices, leave room for plenty of growth. A focus on health equity is almost inherent in designing an access initiative, yet more can be done to reach communities of color not described in any of the 13 studies. For example, only one study examined Asian and Pacific Islanders, an aggregated ethnic group comprising of thousands of unique population subsets, and one of the fastest growing ethnic categories in the United States (DeNavas-Walt, Proctor, & Smith, 2009). Equity was also not discussed extensively in regards to provision of resources, and how an access project may hope to target a certain community but will inevitably increase access for all. This dilemma speaks more towards the difference between equality, providing the same opportunities to everyone regardless of need, and equity, providing fair opportunities for those with the most need (Culyer & Wagstaff, 1993), and it was briefly mentioned by one study in the sample (Audrey et al., 2012).

Utilizing a participatory approach was seldom used in the 13 studies, let alone a process of community engagement from start of initiative to finish. Engaging the community and

receiving community insight is critical in strengthening interventions ability to have a successful change model (Buchanan, Miller, & Wallerstein, 2007). For many low-income communities and communities of color, building trust and developing partnership takes a lot of time but is a necessary step to receive access into the community and to see health behavior changes accepted or adopted (Wallerstein & Duran, 2006). Neglecting to engage with the community beforehand or imposing research initiatives, even if they are meant to enhance access and provide health opportunities, can break trust, shift relationships in the community, and may not be utilized (Sotero, 2006). Beyond the intervention impacts, the community engagement process has value for enhancing health, building solidarity, and empowering the individuals involved and their respective communities (Buchanan et al., 2007; Holden, Messeri, Evans, Crankshaw, & Ben-Davies, 2004; Wallerstein & Duran, 2006)

Similarly, for those studies that did not employ a form of facilitative leadership and a culture of learning, they may leave the community with an inability to maintain some of the access efforts due to a lack of community capacity (Shediac-Rizkallah & Bone, 1998). For many of the priority communities, a lack of access to physical activity can be related to a lack of community capacity, wherein training and leadership opportunities would address this issue (Chaskin, 2001). As physical activity guidelines, recommendations, and models are evolving to include the environment and policy, our models for change must evolve as well to include community engagement and political buy in. Future research should take into consideration an ecological framework, such as the ALbD, to guide the creation and implementation of an access effort in order to create sustainable change.

## CHAPTER III

### GEOSPATIAL ASSET MAPPING OF PHYSICAL ACTIVITY SPACES IN PASADENA, TX

With many U.S. adults not meeting physical activity guidelines, reducing barriers to physical activity is needed to make exercise an easy and convenient choice (Bedimo-Rung, Mowen, & Cohen, 2005). Physical activity performed in places in the community such as parks or other play spaces is often accessible and low or no cost to the resident (Godbey & Mowen, 2003). Increases in overall physical activity levels among adults and children have been found when there is greater access to parks and recreational facilities (Roux et al., 2007; Wolch, Byrne, & Newell, 2014; Timperio, Salmon, Telford, & Crawford, 2005). The quality of these locations is connected to the amount of users in a given place (Giles-Corti et al., 2005a). Having good quality, design, and management of facilities is integral to how the space impacts residents (Beck, 2009). Especially since proximity to green spaces and a built environment suitable for physical activity alone has a positive impact on health (Sallis, Floyd, Rodríguez, & Saelens, 2012; Roemmich et al., 2006). Living near parks or places usable for physical activity, and having nearby recreation and/or sport programming is likely to reduce the risk of being overweight or obese among children (Wolch et al., 2011).

Additionally, however, parks and other physical activity spaces are used more when they offer programming or have sport and/or recreational features that attract people (Cohen et al., 2009a). Experts have speculated that a lack of programs and infrastructure in lower-income neighborhood parks may be one reason that these parks are used less often than parks in neighborhoods where incomes are higher (Cohen et al., 2012). To better understand this issue, studies have been conducted that address the impact of programming. Researchers have found

that facility-specific programming and classes can encourage participation and engagement from a broader demographic, including individuals who would not normally use a park or other recreation facility (Cohen et al., 2009b). Types of facilities commonly used to promote physical activity at the community level include parks, schools, community centers, and faith based organizations.

While many children receive the majority of their physical activity in the school setting, such as through recess, physical education, or active transport, many schools do not provide enough opportunities for children to be able to meet the national 60 minutes a day guidelines (Pate et al., 2006). Nationally, few schools fully implement physical education for all grades in the school for the entire year (Lee, Burgeson, Fulton, & Spain, 2007). Activity levels also drop during the summer months and weekends when children do not have the access to their school's physical activity facilities and structured exercise time, and during seasons with extreme temperatures (Tucker & Gilliland, 2007). Ultimately, youth need additional settings in which to be active outside of the school day to maintain an active lifestyle.

Outside of the school setting, other resources in the inner city communities such as parks can be a common place for physical activity after school hours (McCormack, Rock, Toohey, & Hignell, 2010). In lower-income and ethnic minority communities, recreation venues often do not have adequate amenities or infrastructure, are poor in condition, are associated as a common meeting place for criminal activity, and may not be accessible for families. Also, the number of parks may be insufficient to serve urban populations (Cohen et al., 2011; Gordon-Larsen, Nelson, Page, & Popkin, 2006; Powell, Slater, & Chaloupka, 2004; Wolch, Wilson, & Fehrenback, 2005; Scott & Jackson, 1996). Within the state of Texas, there is a lack of safe places for physical activity with only about 53% of youth having access to parks or playgrounds,

community centers, and sidewalks or walking paths in their neighborhood (Centers for Disease Control and Prevention [CDC], 2015). To overcome the barriers to access to physical activity within the community, and the shortcoming of many schools in meeting the physical activity needs of students during the school day, a first step is to examine all potential locations for physical activity, including schools, parks, churches, and community centers, outside of regular school hours.

To improve promotion efforts around access to physical activity, existing resources need to be identified and communicated. To this end, there must be a process for identifying all of the existing resources within an area (Brownson, Hoehner, Day, Forsyth, & Sallis, 2009). Using a strengths-based approach, community assessments of resources, or assets, encourages community participation in the health development process (Morgan & Ziglio, 2007). For example, ‘asset mapping’ displays features of the built environment to illustrate community needs and encourage communities to make positive changes to the built environment (Santilli, Carroll-Scott, Wong, & Ickovics, 2011). Particularly for the promotion of physical activity, asset mapping involves the identification of physical activity locations, programs, and resources. Through engagement with community stakeholders, the purpose of this study was to identify all facilities within priority zip codes in the city of Pasadena, TX that have the potential to offer active recreation, sport, and other forms of physical activity, and display this information in an asset map. A geospatial map was created, and refined with information on facility type and quality derived from a survey of facility administrators within the community. The use of Geographic Information System (GIS) technology has been used successfully in studies to assess levels of accessibility and distributional equity (Nicholls, 2001) and as a method to display physical activity resources within a community (Wilson, Kirtland, Ainsworth, & Addy, 2004).

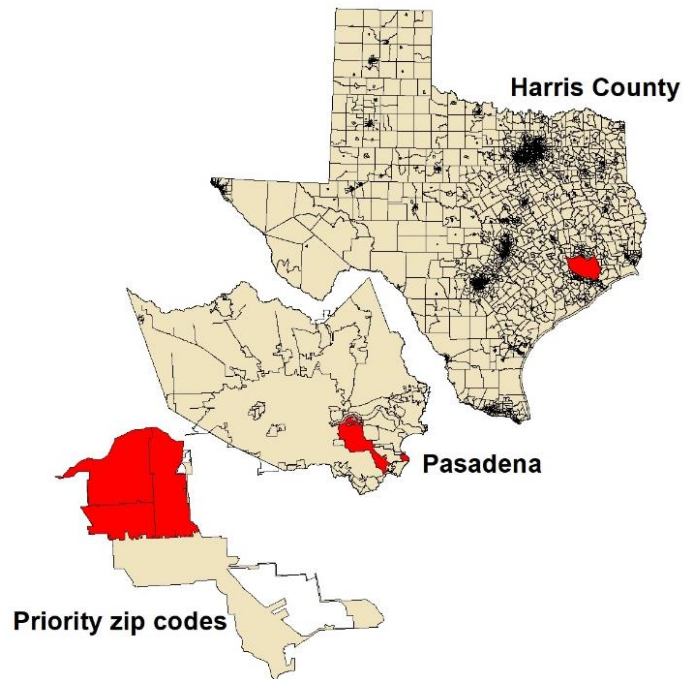
## **Methods**

### *Partnership and Setting*

This project was inspired from conversations held at a town hall on May 26, 2016, held by the Clinton Health Matters Initiative (CHMI) Access to Sports Coalition in Houston TX. Meeting attendees and project leaders discussed the need for the creation of an asset map of physical activity resources as a starting point for the promotion of physical activity for youth within the community. Through an assessment of community needs within the greater Houston Metropolitan area, the Clinton Health Matters Initiative identified the city of Pasadena, see Figure 2.1, as a target location given the lower socio-economic status, lower attainment of higher education, and a high population of ethnic minority families.



Figure 2.1: Priority zip codes in Northern Pasadena, TX



Local community partners in Pasadena, including the Healthy Living Matters (HLM) Coalition were contacted to discuss the project focus. After discussions with the HLM Coalition, three priority zip codes along the Northern portion of Pasadena (77506, 77502, and 77503) were utilized to focus efforts in areas of highest need when compared to other areas within Pasadena, and to align with other community led health efforts. A list of all facilities with the potential for offering active recreation, sport, and other forms of physical activity was created and vetted with community partners including CHMI, HLM, and a Houston representative from the YMCA. The list included all schools within the Pasadena Independent School District, park facilities within

Pasadena Parks and Recreation, churches within Pasadena, two community organizations, a local business, and a community health center.

### *Mapping Process*

Once the list of potential sites was created, data points were identified, converted into geocodes, and mapped using ArcGIS. Geospatial information was gathered for locations with the potential for offering active recreation, sport, or other forms of physical activity, including parks and recreation facilities, schools, faith-based organizations, businesses, and health facilities within the priority zip codes. Analysis in ArcGIS included joining of publicly available shape files including Census population data, Census blocks, road networks, and zip code boundaries, and buffer analyses around each facility within the priority zip codes.

All potential facilities with physical activity space were given quarter mile radial buffers around each facility, as this distance is used by national nonprofit organizations including the Trust for Public Land, to define access to a park, and is walkable for children, youth, and their families (Wolch, Wilson, & Fehrenbach, 2005; Regional Plan Association, 1997). The quarter mile buffer layer demonstrates areas where facilities are available, and areas that are lacking facilities, or have “gaps” in access. Next, we combined the facility locations identified as points, and the potential reach for each of the locations reflected by the buffer analysis, within the three priority zip codes. Revisions also included adding relevant results from a self-report community survey of facility administrators. This survey was conducted by the lead author simultaneous to this project, and received Institutional Review Board approval from Texas A&M University. Results added included the types of amenities existing at each facility location, whether or not the facility is purposed and equipped with infrastructure for active recreation, sport, or other forms of physical activity (developed), was open to the general public (open), and the condition

of the facility (condition). Facility condition was rated by facility administrators choosing from a 5 point Likert scale (extremely bad, somewhat bad, neither, somewhat good, extremely good) for each amenity (Rung, Mowen, Broyles, & Gustat, 2011). A facility was indicated as “good” if at least one of the amenities at the facility was reported to be somewhat good or in extremely good condition.

The final step in the process resulted in a series of map revisions based on meetings and conversations with project stakeholders, CHMI, HLM, and additional community partners including Harris County Public Health, and MD Anderson. A layer was added to determine population density within the three priority zip codes and whether facilities were within reach of highly dense areas, and locating a potential site for a school park remodel. Population density was found by using US Census 2010 data at the Census Block level to determine population per square mile.

## **Results**

Through collaboration with community partners and project stakeholders, and with information from a community level survey, a geospatial map was created to display spaces with the potential for physical activity within priority zip codes in Pasadena, TX. A total of 53 facilities, see Figure 2.2, were identified within the priority zip codes, including 30 parks, 25 schools, 9 faith-based organizations, and 4 others (a business, a non-profit healthcare center, and two community-based organizations). Overall, between all of the facilities, there were a total of 131 amenities. Playgrounds, outdoor basketball courts, and ball fields were the most common types. Some facilities had multiple amenities at their location, including many of the parks and

schools. Additionally, respondents noted other types of amenities where activity took place such as parking lots, grassy areas, classrooms, and other indoor areas.

When adding the quarter mile buffers as seen in Figure 2.3, facility clusters appeared along Southmore Ave., one of the main streets within a priority zip code. The top portion of the map has been removed as this area is an old refinery with no current population and does not have census data available. Beyond this main cluster, there are several visible gaps where there is not access to at least one facility within the quarter mile range. When assessing facility to facility access, sixteen of the 25 schools in Pasadena had at least one park within a half mile, and eighteen of the 25 schools had at least one other recreational facility of any type within a half mile.

Figure 2.2: All potential facilities by sector type within priority zip codes

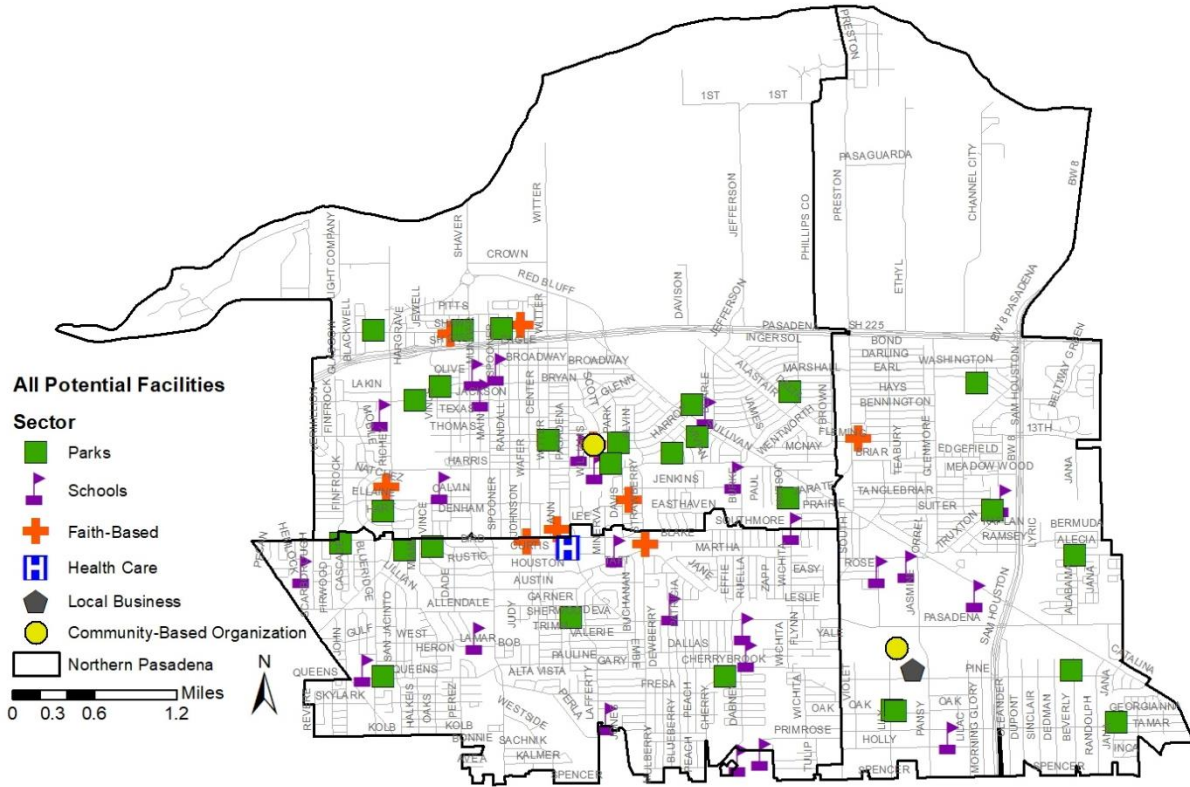
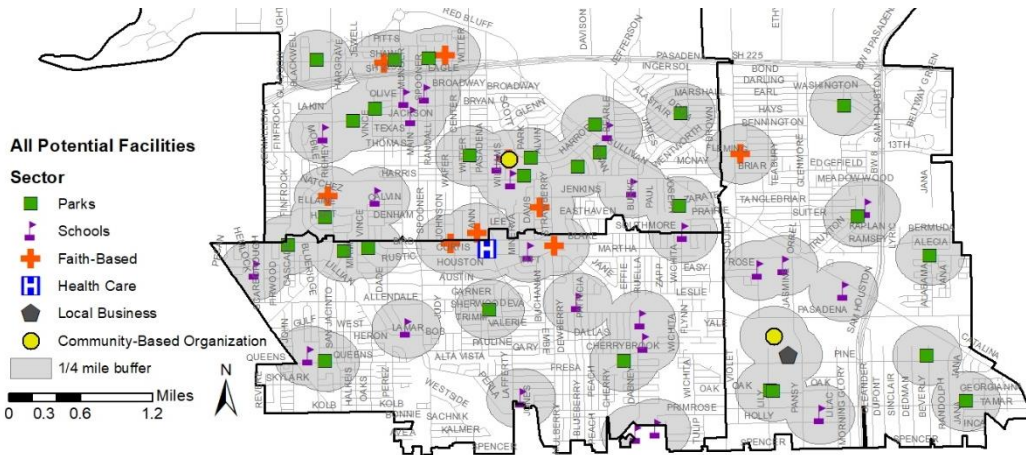
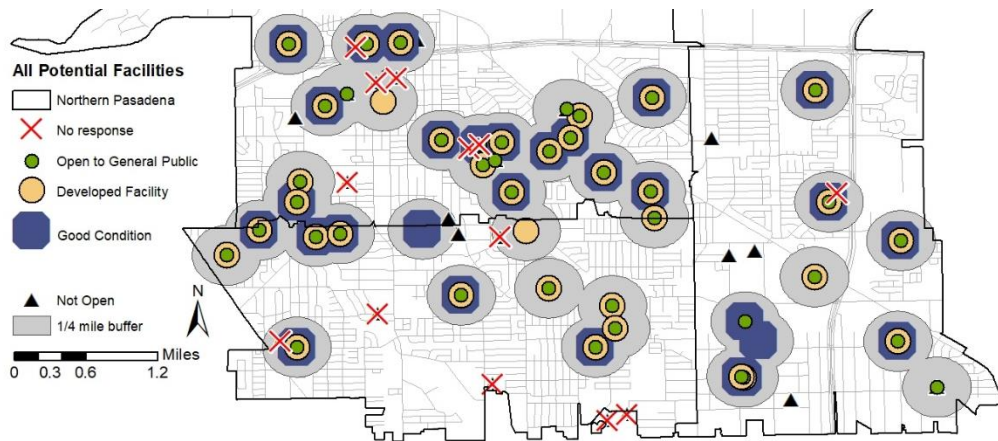


Figure 2.3: Quarter mile buffers surrounding all facilities in priority zip codes



When adding survey data to the map (see Figure 2.4), we were able to demonstrate 102 of the 131 amenities were open to the general public, with all playgrounds and almost all outdoor basketball courts and fields open to the public. Amenities that were not open to the public included many of the jogging paths, gyms, and aquatic facilities. Facilities were identified as having developed infrastructure if they had at least one amenity purposed for active recreation, sport, or other form of physical activity. A total of 37 of the 53 facilities were found to have developed infrastructure. Conditions of the facility was determined to be “good” if at least one amenity was reported to be in somewhat or extremely good condition by respondent of the community survey of facility level administrators. A total of 28 of the 53 facilities were found to be in good condition. The other 25 facilities had no amenities that were considered “good”.

Figure 2.4: All facilities in the priority zip codes open, developed, and in good condition

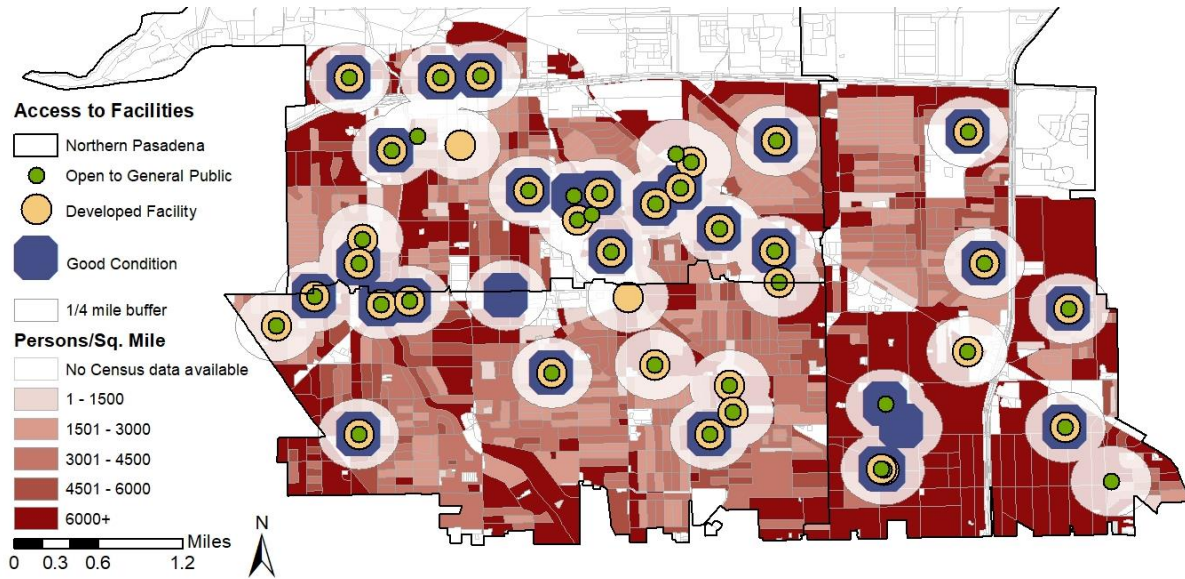


When adding population density to the buffers, gaps in access are displayed within the southeast quadrant of the map where a higher concentration of people live and have limited access to facilities (see Figure 2.5). In addition to the primary place where access is limited to a large number of people, several others areas on the map have a high percentage of people living there and a lack of access to at least one facility. After adding in the layer describing whether or not the facility is open to the public, developed and in good condition, the map revealed a discrepancy between areas of high population density and access to facilities (see Figure 2.6).

Figure 2.5: Comparison of population per census block with quarter mile buffers



Figure 2.6: Quarter mile access to facilities compared with population per census block



## Discussion

Mapping the facilities in Pasadena illustrating only those that were open, developed, and in good condition shows inadequate access to places for physical activity. While all potential facilities may seem to reach most of the residents, taking away facilities' that are not open to the public substantially reduces the amount of reach the facilities have into the community. While it cannot be shown as causal, the low levels of physical activity and high levels of childhood obesity within Northern Pasadena may be linked to the lack of availability to be active in places where residents live (Roux et al., 2007). This finding is similar to those of national studies linking a lack of access to low levels of physical activity, and higher rates of obesity (Cutts,



Darby, Boone, & Brewis, 2009; Wolch et al., 2011). Addressing the lack of access must be central in the fight against childhood obesity and improvement of children's health.

This is the only known study utilizing mapping that investigates access to physical activity spaces and sharing of facilities in a lower-income community. The process of working with community partners to create an asset map of physical activity locations helped us to identify all of the potential locations where people have access to physical activity spaces within the Pasadena area. This process highlighted areas where facilities were needed, where facilities should be opened for use by the general public, and where the quality and condition of facilities were in need of improvement if access to areas with developed infrastructure was to be improved. Discussions with the community allowed for additional layers to be considered such as population density, which helped to aid our understanding of where the need for access to quality facilities is of greatest need.

Further understanding the shared use of physical activity spaces between organizations can help fill gaps to access within the asset map. For example, schools or churches lacking developed infrastructure can partner with parks to provide physical activity programming on park property. Shared use of facilities within Pasadena would be beneficial whether sharing physical activity space (a Healthy People 2020 objective), or by simply opening up the space to the community before, during and after school or work hours, as well as on weekends, holidays and over the summer (Office of Disease Prevention and Health Promotion, 2011), or by entering into shared or joint use agreements between facilities or other partnerships (Young et al., 2014). Facilities that are open to the public, with developed infrastructure and in good condition would be the most ideal candidates for sharing with other facilities through partnerships. Also, with most of the facilities open being outside, this map identifies, consistent with the literature, the

need to share and open indoor facilities as it gets very hot and humid in Pasadena over the summer months (Tucker & Gilliland, 2007).

For those facilities that are not the most ideal, a next step would be to advocate for improvements in infrastructure and quality. Within Houston, there has been support to increase youth access to sport and places to be active, including programs such as CHMI's Access to Sport, and the SPARK School Park Program, which assists public schools in developing their recreational space to become community assets (n.d.). Utilizing programs such as SPARK, and mobilizing other community programs provides the needed opportunities to remodel or enhance all facilities within the Pasadena area that are not in "good" condition. While the map provides a representation of access to places to be active, it does not account for roads or walking paths. Adding street connectivity to the map may hint at further limitations of reach to the community as there are major roads and highways that separate the community from many of these facilities (Giles-Corti et al., 2005a; Huston, Evenson, Bors, & Gizlice 2003).

A study limitation was that a few facilities, predominantly churches, did not provide information on whether or not they were open to the general public. However, due to the number of facilities with amenities in poor condition, it is unlikely that these missing facilities would substantially impact the issue of access relevant to the overall asset map. Also, the condition of facilities was self-reported through the community survey. Future efforts should consider facility audits to assess condition and quality of the physical activity spaces. In conclusion, the creation of an asset map of physical activity spaces in Pasadena provides a great community resource to facilities that can be used for physical activity. Future efforts to identify community assets for physical activity should include community partners and the inclusion of multiple types of facilities.

## CHAPTER IV

### AN EXAMINATION OF FACTORS ASSOCIATED WITH SHARED USE DECISIONS AMONG ADMINISTRATORS OF FACILITIES USED FOR RECREATION AND SPORT IN PASADENA, TX

Increasing access to physical activity opportunities is associated with positive changes in youth physical activity behavior and many additional individual, social, economic and environmental benefits for communities (Roemmich et al., 2006; Kahn et al., 2002). Increasing access to physical activity can be described as changes to local environments that create new opportunities for physical activity or reduce the cost of existing opportunities (Briss et al., 2000). However, communities of color and lower-income areas often have fewer locations, and limited access to places that can be used for physical activity (Wolch, Byrne, & Newell, 2014). Also, many communities have limited opportunities to provide physical activity programming because existing facilities do not share their recreational space, and/or may restrict availability to the general public (Evenson, & McGinn, 2004; Evenson, Wen, Lee, Heinrich, & Eyler, 2010).

One solution to this challenge is through the shared use of existing community spaces to provide opportunities for physical activity. Shared use refers to situations where schools or other entities open up their facilities during non-school or non-business hours for community use. Sharing physical activity spaces is an American Heart Association (AHA) recommended strategy to increase physical activity in the community setting (Young et al., 2014). Benefits of shared use include increased physical activity levels for the community, shared schools or facilities as a resource for the public, and increased levels of physical activity leading to potential improvement in children's academic performance (Farley et al., 2007; Young et al., 2014). A

survey of four geographic regions in the United States found that of all types of shared facilities, outdoor public facilities were more likely to be available to the community than indoor facilities (Evenson & McGinn, 2004). Nationally, challenges to opening facilities to the community include liability, insurance, safety, cost, staffing and maintenance (Spengler, 2012a). For low socioeconomic status communities and in communities of color, facilities are less likely to offer shared use than in higher income communities (Cox et al., 2011).

Another method to provide access is through a formal contract between the facility and another entity including municipalities, nonprofits, or faith-based groups and is called a shared-use agreement (Young et al., 2014). Shared-use agreements encourage physical activity by collaborating with organizations that offer organized, supervised activities, such as a sports league utilizing a community park (Spengler, 2012a). Barriers to implementing shared-use agreements are the facility costs, misuse, and liability concerns (Spengler, Ko, & Connaughton, 2012b). With these challenges in mind, the AHA recommends community-based research on shared-use to further investigate the process, outcomes, and the networks connecting partners in the community setting (Young et al., 2014). Over the last decade, national studies have found a lack of progress in the shared-use landscape, and missing community level assessments (Evenson et al., 2010; Evenson et al., 2004; Spengler, 2012a; Spengler, Connaughton, & Carroll, 2011a).

The purpose of this study was twofold. The first was to determine facilitators and barriers, and other key issues, relevant to sharing facilities with the public for the purposes of active recreation, sport, and other forms of physical activity in Pasadena, Texas. The second was to pair results with a prior study by the lead author, in order to identify facilities and facility characteristics within priority zip codes in the city of Pasadena that currently provide an

opportunity for active recreation, sport, and other forms of physical activity, and display this information in an asset map.

## **Methods**

### *Partners*

The research team from Texas A&M University's School of Public Health attended a town hall hosted by the Clinton Health Matters Initiative (CHMI) in Houston, Texas, where community input and perspective was solicited to the current state of shared use and existing physical activity networks and spaces within Houston. From this meeting, the team was encouraged to focus efforts on a smaller portion of the Houston area, Pasadena, due to the project's scope and community's need. After refining project goals, the team collaborated with community partners, CHMI, Healthy Living Matters (HLM), and the Harris County Public Health, via email and by phone over the next several months.

For the Houston area, CHMI's initiative is to increase access to sports for all youth in the greater Houston area, especially for ethnically diverse, and low-income youth. One of CHMI's stakeholders, Healthy Living Matters (HLM) – Pasadena, is a community coalition which has over 80 organization members ranging from MD Anderson and Catholic Health Initiatives (CHI) St. Luke's Health, to the City of Pasadena's Health Department, Parks and Recreation, School District, and faith-based organizations. HLM has similar goals to CHMI, with a focus on the reduction of childhood obesity through policy efforts and increased visibility. One of their main policy actions most relevant to our project goes by the name "PLAY" (not an acronym), which aims to promote safe, adequate, and appropriate physical activity for all children in Harris County.

Collaborative efforts among the research team and community partners, included the creation of a facility list for all locations with potential to support active recreation, sport, and other forms of physical activity, identification of facility administrators for each of the facilities on the list, and input on survey design and delivery. After the facility list was vetted, surveys were distributed to facility administrators. From their respective entities, community partners sent reminder emails, and encouraged survey participation during data collection. With the assistance of, and collaboration with community partners, administrators of the physical activity facilities associated with the asset map (see chapter three), were identified and surveyed.

### *Setting*

The target area for this study was the city of Pasadena which borders the city of Houston, Texas. Pasadena has approximately 36% of residents living below the federal poverty level, 57% racial or ethnic minority, 26% of people aged 25 and older with less than a high school degree, 77% of children are overweight or obese, and 77% of overall residents getting less than the recommended levels of physical activity (Harris County Public Health & Environmental Services [HCPHES], 2014). A recent effort to increase access to physical activity in Pasadena include documenting physical activity resources. Specifically, the Clinton Health Matters Initiative (CHMI) has identified access to physical activity as a target area to reduce preventable health outcomes recurrences, and has worked within the Houston area to develop an Access to Sports Coalition. CHMI's Coalition, Healthy Living Matters (HLM) – Pasadena, a community level coalition, is in support of implementing shared-use agreements or developing community-school partnerships.

While there is an escalation in efforts to increase access to physical activity, sport, and play in the Houston/Pasadena area such as CHMI and HLM, there is a lack of data surrounding

existing physical activity resources to support advocacy efforts and policy implementation. After discussions with community partners, three priority zip codes within the northern portion of Pasadena (77506, 77502, 77503) were set as the target area. This area has higher rates of childhood obesity, families living below the poverty line, greater ethnic diversity, and is consistently used as a target priority for community led initiatives (HCPHES, 2014). Only facilities within the geographic region of the three priority zip codes were included in this study.

### *Procedures*

In August 2016, a list of all facilities with the potential for active recreation, sport, and other forms of physical activity within three priority zip codes (77506, 77502, 77503) in Pasadena was created and vetted with community partners. The list included all schools within the Pasadena Independent School District, Pasadena Parks and Recreation park facilities, local churches, two community organizations, a local business, and a community health center. A self-report online survey was developed using Qualtrics, and administered to facility administrators at K-12 schools (n = 25) and parks (n = 30), church leaders (n = 10), community organizations (n = 2), a health care center, and a local business in October and November 2016. Facility administrators were the principals of the schools, the head of the Pasadena Parks and Recreation Department, lead pastors at each of the churches, and the directors of the other facilities. Some facility administrators, including the parks administrator, were responsible for more than one facility within the priority zip codes, and were asked to respond once to the survey. Surveying facility level administrators has been used in prior studies to understand key barriers to shared-use (Spengler, Connaughton, & Maddock, 2011a).

Survey items were derived from previously validated surveys (Spengler, Ko, & Connaughton, 2012b), reviewed by a panel of experts, and received Institutional Review Board

approval (IRB2016-0511D) from Texas A&M University. Survey items included demographics of the facility level administrator, description of the types of physical activity programs offered, communication, partnership, and level of sharing with other entities, and the facilitators and barriers to shared-use of each individual facility. Recruitment included first a contact attempt to facility administrators via email which contained the survey link, a follow up call the following week, and consecutive emails and calls for the second and third attempts. Survey results were collected, with results analyzed. Additionally, some results were linked to a geospatial map of the facilities, and shared with community partners for input before finalizing the map.

## **Results**

A total of 25 facility administrators responded to the survey to account for 53 of the 68 facilities (78%), and a response rate of 64% for facility administrators. Within each sector, responses accounted for all of the 30 parks, 13 of the 25 schools, 6 of the 9 churches, and all of the other 4 organizations. Common types of physical activity programs offered at the facilities included team and individual sports and practices (in parks), physical education classes, recess, and free play (in schools), and other activities such as youth group and ladies exercise classes (in churches), and boot camps (in other organizations).

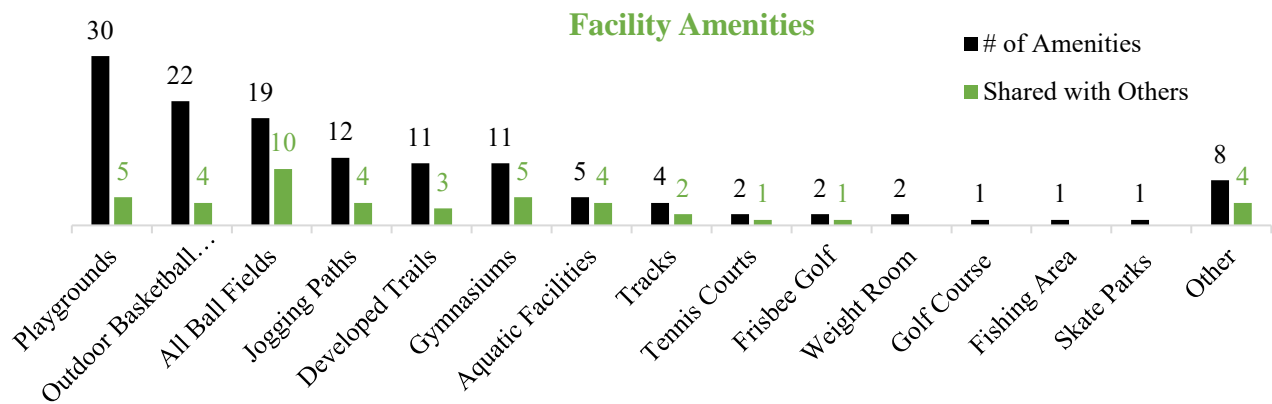
With regard to communication *between* organizations such as schools, churches, and parks about physical activity opportunities, 14% reported contact monthly, 29% quarterly, 29% yearly, and 29% never communicated at all. Specifically, four parks communicated daily, and five schools communicated with parks quarterly about providing opportunities for physical activity. In response to describing current relationships with other organizations, one facility



administrator responded that they collaborate (work side-by-side and actively pursue opportunities to work together) with at least one other organization in the priority zip codes, two responded with coordination (work side-by-side as separate organizations to achieve common program goals), two with cooperation (share information and work together when any opportunities arise), two with communication only (share information only when its advantageous), and the other responses were not linked or integrated with another organization regarding physical activity opportunities.

For shared use of space, 33% of amenities such as fields, courts, etc., were shared with other entities for the purpose of providing opportunities for physical activity, see Figure 3.1. When looking at the aggregate, all sectors shared some of their space, with ball fields, playgrounds, and gymnasiums reported as the most commonly shared amenities. Only parks reported that they had formal shared-use agreements (contracts) governing the shared use of the following amenities: ballfields, tennis courts and jogging paths. These agreements were with two high schools and three baseball/softball leagues. No park facilities were shared with faith-based organizations by formal agreement.

Figure 3.1: Type of facility amenities shared with others



The survey asked facility administrators to discuss facilitators and barriers when sharing their facility with the public or other entities by responding to two separate Likert scales. Each scale had several preselected items listed regarding shared-use with response options ranging from *not at all important* to *extremely important*. Table 3.1 displays facilitators and barriers with relation to the type of facility sector. Overall, the key facilitators to sharing facilities were building relationships and collaboration, service to the community, and improving health. For schools, churches and others, building relationships with families was the most important facilitator while public service was most important for parks. Overall, the most common barriers reported were cost, maintenance, staffing and prioritizing use with limited time, facilities and resources. The sectors differed in the most important barrier with parks reporting priority of use issues, schools reporting liability concerns, churches reporting staffing, and others indicating cost as the most important barrier. Once all survey data were collected and studied, results were shared with community stakeholders through a formal presentation with time for feedback regarding dissemination efforts and recommendations for future use.

Table 3.1: Self-report of facility administrators facilitators and barriers to shared-use

<i><b>Facilitators</b></i>			
Parks	Schools	Churches	Others
Public service	Building relationships with families	Building relationships with families	Building relationships with families
Revenue generation	Providing a clean, safe environment to be active	Providing a clean, safe environment to be active	Providing a clean, safe environment to be active
Meeting health and physical needs of the community	Meeting health and physical needs of the community	Improve community health	Building community support for financial incentives
<i><b>Barriers</b></i>			
Parks	Schools	Churches	Others
Priority of use issues	Liability concerns for supervised & unsupervised activities	Staffing - Security, supervision, maintenance - Programs/activities	Cost - Personnel - Running programs/activities
Limited hours of availability	Misuse and damage to park facilities	Insurance	Scope of maintenance responsibilities
Staffing - Security, supervision, maintenance - Programs/activities	Staffing - Security, supervision, maintenance	Cost - Maintenance	Cost - Maintenance

## **Discussion**

Overall, from the survey responses, several existing physical activity programs were offered across the organizations, demonstrating there are some opportunities to be active within the priority zip codes. Findings regarding communication and partnership reveal insufficient communication patterns, with at most a few organizations communicating monthly or less frequent, and only one organization reporting that they collaborate with another entity. While

there are physical activity programs, growth in communication and coordination of these efforts may help mobilize residents to participate in opportunities. In particular, communication must improve where opportunities for partnerships exist between organizations within walking distance. Consistent with the efforts around the Centers for Disease Control and Prevention's (CDC) Comprehensive School Physical Activity Program, strong coordination between all organizations in the priority zip codes can help youth participate in, and reach national guidelines for physical activity (Centers for Disease Control and Prevention [CDC], 2013).

Across sectors, respondents reported trends in facilitators to shared-use showing a willingness and interest in sharing facility space with the community. Aligned with many of the benefits of shared-use, respondents stated they would be encouraged to share their facility to meet the health needs of the community and to build better relationships with families. In efforts to promote shared-use, these motivating factors can be used as a communication tool to support efforts to solicit buy-in regarding the sharing of facilities, either informally or through a formal, contractual agreement. In regard to barriers to shared-use, this study mirrors national efforts in the types of challenges faced by facility administrators including staffing, liability and cost. As an example, results of this study support findings from national studies where liability was found to be an important and primary barrier to shared use for schools (Spengler et al., 2011a). Adding to the knowledge gained from the findings from national studies, this community assessment reveals sector level differences in the barriers faced by facilities within the priority zip codes. Attention to the sector differences will be crucial in creating a coordinated and connected network of partners, and addressing gaps in access and programming as can be indicated on a community asset map.

Utilizing formal shared-use agreements may help address the barriers surrounding liability, misuse of facilities, insurance, and maintenance; concerns expressed by facility administrators. For example, a sport organization may enter into an agreement with a school, stating they will take care of the field, or might take on the risk of liability, in exchange for use of the school facilities. These types of formal agreements set guidelines for use, and help address and relieve concerns among parties apart of the agreement (Young et al., 2014).

Written policies on shared use, though important, are not effective without communication and implementation. A Pasadena Independent School District policy, for example, states to allow community relations and non-school use of facilities (Pasadena ISD 101917). Though the policy exists, it is possible that not all the schools are aware of the policy, and for those that are aware, how to implement the policy for the purposes of shared-use. Also, community partners and organizations interested in physical activity promotion may not be aware that schools in Pasadena have the ability to enter into a shared-use agreement. Such partners might include professional sports team interested in offering camps and after school programs, as well as the Young Men's Christian Association (YMCA), which was recently forced to close its location within the priority zip codes. Additionally, past efforts involving shared-use agreements have primarily targeted schools, and churches and other organizations have not participated. To promote shared-use for these particular facilities in the priority zip codes, additional education and awareness efforts must be carried out by community partners.

To help schools who may also have a cost barrier, the Joint Use Cost Calculator, developed by 21<sup>st</sup> Century School Fund and University of California-Berkeley's Center for Cities and Schools, allows schools to determine the cost of ownership of all of its facilities and grounds and enables schools to develop a fee structure for community use based on cost of ownership

(Filardo, Vincent, Allen, & Franklin, 2010). While developing a fee structure is only a part of the process to enter into a shared-use agreement, it will allow community organizations to negotiate for the utilization of school facility space. Similarly, these formulas and processes can be utilized for churches and other organizations who expressed cost as one of their main barriers to shared-use.

The strategic utilization of the community asset map from chapter three may also assist strategies to promote the sharing of physical activity spaces. The primary author of this paper has created a map that serves to locate facilities that are currently open to the general public and in good condition. While there may be facilities whose barriers to shared-use cannot be addressed, there are several other facilities that can be used as a setting for organizations interested in providing physical activity programs in Pasadena. The Pasadena Parks and Recreation Department hosts “pop-up parks” where a location is set to offer free physical activity programming to the community in areas of need. Using the map will help to locate areas that have at least one available facility, and would benefit from additional programming to serve residents within the area.

Unique to this study as compared to national studies conducted on shared-use is the investigation of faith-based organizations and their respective facilities. In the last 10 years, physical activity interventions in faith-based organizations have increased, and have been fairly successful at improving health (Tristão Parra, Porfirio, Arredondo, & Atallah, 2017; Lancaster et al., 2014). The CDC has suggested faith-based organizations as settings to promote physical activity, and the National Physical Activity Plan dedicates a section to faith-based settings (CDC, 2011; National Physical Activity Plan Alliance, 2016). Interestingly, several respondents from faith based organizations mentioned the confusion or lack of fit for participating in this study due

to their affiliation as a church. When probed further to determine the level of physical activity programming and facility space available for physical activity, many of these organizations were not only equipped with amenities that could be used for the purposes of physical activity, but also offered physical activity programming, and were interested in being a part of the shared-use network. These facilities hold great potential for serving the physical activity needs of people in the community and within the priority zip codes.

The study had several limitations. First, while church participation is listed as a strength of the study, a limitation is that we were not able to secure participation from all the churches, with speculation, and confirmation from one respondent that churches may have opted out due to feeling of lack of fit or relevance to the study. Another limitation was that there were a few organizations that were not included on our list that study participants reported in the survey. These were two Spanish-language churches, and the City of Pasadena who was a stakeholder in the study but was not considered a participant despite the city offering programs and having some facility space.

This research will inform ongoing efforts to promote access to physical activity through the identification of facilitators and barriers to shared use and communication of this information, to facility administrators and interested stakeholder groups within Pasadena in efforts to increase shared use of space, and encourage shared-use agreements. Understanding the reasons for not opening or sharing space can be used as a starting point in negotiating use and developing contractual arrangements for sharing space. Also, promotional efforts can be enhanced by understanding the motivating factors behind sharing physical activity spaces with the public. This study is the first of its kind to address shared use at the community level, and can

serve as a blueprint, in conjunction with asset mapping, to guide future efforts around promoting and increasing access to physical activity spaces within communities.



## CHAPTER V

### CONCLUSIONS

This work adds to the growing research base surrounding access to physical activity by examining methods employed to increase access, outlining a process to map access in a community setting, and providing community level suggestions to address facilitators and barriers to shared-use. To better understand the landscape and develop a framework, the overall study implemented a three-step process involving community engagement, identification of resources, and assessing shared-use of existing space.

The first step is to create a collaborative partnership with community entities or a local community coalition. Through the literature review and both studies within Pasadena, using a community process was crucial in understanding and defining access. The second step is to scan the existing resources for physical activity within a geographic setting, and illustrate through an asset map. This second step provides the community a resource and also highlights any areas that may be a potential starting point or area of most need. To expand the reach of existing resources throughout the community, a third step would be to do an assessment of the facilities' conditions, sharing practices, and facilitators and barriers to shared-use. The assessment within Pasadena provided clear directions towards strategies to increase shared-use. Once this initial three-step process has been conducted, one of the proven methods to increase access discovered through the systematic review could be utilized. Lastly, using an ecological framework such as the ALbD community action model and the six essential practices to create sustainable community change would enhance any approach taken.

Lessons learned from this work include the finding of a limited number of articles within the literature review, suggesting more can be done to address inequalities in physical activity opportunities. Mapping the facilities in Pasadena provides a great community resource but illustrates inadequate access to places for physical activity in spaces that are open, developed, and in good condition. From the survey, the trends in facilitators to shared-use show a willingness and interest in sharing facility space within Pasadena. Utilizing formal shared-use agreements may help address the barriers and concerns expressed by facility administrators.

Limitations of this work include differences in the approaches used within the literature review, with 13 diverse methods to increase access. In the asset mapping study, though the maps were vetted with community partners, and presented to the community coalition, community resident input was not gathered to ensure readability of the project maps. For the survey, the main concern was small community level sample size of three zip codes. Even though the sample was small, results are exploratory and informative. Another concern was self-report bias, as many of the administrators reported positively regarding the conditions of their facilities. When talking to the churches over the phone or through email, many church stakeholders did not feel that they could contribute to the study even though their church held exercise classes or some form of physical activity for its members.

Future efforts can be derived from this work to increase access to physical activity in low-income communities and communities of color. When mapping access to physical activity in a particular community, efforts should consider facility audits to assess condition and quality of the physical activity spaces, and should include community partners during the process. Also, efforts should utilize an ecological framework, such as the ALbD, to create sustainable community change. Findings from the survey can serve as a blueprint, in conjunction with the lessons learned

from asset mapping, to guide future efforts around promoting and increasing access to physical activity spaces in a community setting.

The three papers employed a community-based, multi-modal approach to map and better understand opportunities for physical activity within lower-income communities and communities of color, and the related facility level facilitators and barriers to providing access for opportunities. Since the negative correlation between access to a safe built environment is tied strongly to prevalence of obesity and other non-communicable diseases, increasing access has positive implications for shifting health disparities of disadvantaged populations, and should continue to be a priority in community health research (Gordon-Larsen et al., 2006). Further studies are needed to refine research protocol for understanding access and shared-use at the community level through the combined use of geospatial mapping and surveys, and more long term qualitative research to understand the key components of success for access efforts aimed at improving physical activity.

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APPENDIX

Search Terms	Database	Results	Year frame
(((access) OR opportunities)) AND ((exercise[MeSH Terms] OR "physical activity" OR "sports and recreational facilities"[MeSH Terms])) AND (("low income population" OR "poverty areas"[MeSH Terms] OR "ethnic groups"[MeSH Terms] OR "cultural diversity"[MeSH Terms] OR "socioeconomic factors"[MeSH Terms] OR "communities of color"))	Pubmed	937	All available
Access OR opportunities Exercise (mesh) OR leisure activities (mesh) OR sports and recreational facilities (mesh) Low income population OR socioeconomic factors (mesh) OR communities of color OR ethnic groups (mesh) OR cultural diversity	Cochrane Library	63	All available
Access OR opportunities Exercise OR "physical activity" OR "leisure activities" OR "sports and recreational facilities" OR play OR sport "Low income populations" OR "socioeconomic factors" OR "communities of color" OR "ethnic groups" OR "cultural diversity" OR "poverty areas"	PsycINFO	557	All available