

PARK ENVIRONMENTS AND YOUTH PHYSICAL ACTIVITY: EXPOLRING THE  
INFLUENCE OF PROXIMITY AND FEATURES ACROSS KANSAS CITY, MISSOURI

by

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## ABSTRACT

**Background:** With the dramatic increase in childhood obesity rates over the last three decades, parks can offer an accessible and affordable population-level solution to the important issue of youth physical inactivity. The primary purpose of this study was to examine the association of park proximity and park features with nearby youth achieving recommended levels of physical activity.

**Methods:** This community-based study was conducted in Kansas City, Missouri. Valid physical activity data were obtained for 191 youth via a parent proxy survey with an overall response rate of 27.4%. Geographic information systems (GIS) were used to create three measures of park proximity within 1 mile of children's homes. Detailed park characteristic information for all parks within 1 mile of the youth (n=146 parks) was obtained via observational audits. Binary logistic regression analyses were used to examine the relationship between each park proximity and park characteristic variable and the likelihood of youth meeting physical activity recommendations, while controlling individual and neighborhood level covariates.

**Results:** All youth and female youth who had a park within one-half mile of home were more likely to achieve physical activity recommendations than those with no parks nearby. Likewise, all youth and male youth with three or more parks within 1 mile were significantly more likely to achieve physical activity recommendations than those with only 1 park. Further, youth that had a park with a playground within one-half mile or a baseball field within 1 mile of their home were more likely to achieve physical activity recommendations. Finally, having a park with particular amenities within 1 mile from home (transit stops, traffic signals, picnic tables, grills, trash cans, shade, and roads through the park) was also associated with greater odds of achieving physical activity recommendations.

**Conclusions:** Parks are valuable community resources that can play an important role in the battle against rising rates of obesity and chronic disease in youth across the country. Better understanding the ways in which these settings are associated with physical activity among children can inform future research and environmental and policy changes that can promote the health and well-being of generations to come.

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## LIST OF ABBREVIATIONS

### ABBREVIATIONS

BMI

CDC

CPAT

GIS

KCMO

KCMO PARD

NHANES

PA

RWJF ALR

USDHHS

YRBSS

### TERMS

Body Mass Index

Centers for Disease Control

Community Park Audit Tool

Geographic Information Systems

Kansas City Missouri

Kansas City Missouri Parks and Recreation Department

National Health and Nutrition Examination Survey

Physical Activity

Robert Wood Johnson Foundation Active Living Research

United States Department of Health and Human Services

Youth Risk Behavior Surveillance System

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# *Chapter 1*

## INTRODUCTION

### Background and Significance

In the past 30 years, childhood obesity has tripled, creating an enormous concern among public health officials (National Center for Chronic Disease Prevention and Health Promotion, 2010a). Obesity prevalence among children aged six to eleven years and adolescents aged twelve to nineteen years has increased 13.1% from 1980 to 2008 (NCCDPHP, 2010a; National Center for Health Statistics, 2004). The 2007 nationwide Youth Risk Behavior Surveillance System (YRBSS) found that approximately 16% of high school students were overweight, and 13% of students were obese (Eaton et al., 2008) while the 2007-2008 National Health and Nutrition Examination Survey (NHANES) estimated that 17% of children were obese (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010). According to the U.S. Surgeon General, today approximately 12.5 million children are currently overweight (US Department of Health and Human Services, 2009).

Childhood obesity trends are an important concern for public health officials. Studies show that children who are overweight are 70% more likely to be overweight or obese as adults (Ferraro, Thorpe, & Wilkinson, 2003; NCCDPHP, 2010a), and children who became obese by age 8 are more likely to be severely obese as adults (Freedman, Khan, Dietz, Srinivasan, & Berenson, 2001). Childhood obesity is significantly associated with increased risk for numerous health concerns such as high blood pressure, diabetes, high cholesterol, heart disease, depression, poor health status, and premature mortality (Franks et al., 2010; NCCDPHP, 2010a; Yeung, Zhang, Buck Louis, Willett, & Hu, 2010).

## Physical Activity

Being physically active can significantly reduce the risk of obesity and obesity-related chronic diseases (NCCDPHP, 2010a; USDHHS, 2009). Physical activity (PA) recommendations from the 2008 PA Guidelines for Americans specify that children and adolescents should acquire 60 minutes or more of moderate to vigorous aerobic activity everyday and participate in muscle and bone strengthening activities at least three days a week (USDHHS, 2009). However, the 2007 YRBSS indicated that only about one third (34.6%) of students in grades 9-12 met recommended levels of PA. Additionally, 24.9% of students stated they did not achieve these recommended amounts on even one day of the week (Eaton et al., 2008).

Youth PA disparities exist by sex, race, and age (Eaton et al., 2008). Statistics show that boys (43.7%) are more likely than girls (25.6%) to achieve recommended levels of PA. Additionally, differences exist amongst racial/ethnic groups with both Black and Hispanic youth achieving less PA than White children. Moreover, PA trends indicate that participation in PA decreases as children get older (Eaton et al., 2008; NCCDPHP, 2010b). A recent study found an overall decrease in participation of PA of youth aged 12-13 over the last five years (Belanger, Gray-Donald, O'Loughlin, Paradis, & Hanley, 2009), while a review of temporal trends in PA supported a general decreasing tendency in youth PA with age (Knuth & Hallal, 2009).

## An Ecological Approach

Due to the substantial increase in childhood obesity rates and the decline of participation in PA over the past few decades, research paradigms have refocused from narrow individual or biological based concepts to a more broad approach, encompassing both social and environmental factors related to obesity and PA (Ferreira, van der Horst, Wendel-Vos, Kremers, van Lenthe, & Brug, 2007). However, researchers have only recently begun to investigate physical environmental

correlates as possible mechanisms that can facilitate or hinder youth PA (Sallis & Glanz, 2006). A current review of environmental correlates of PA in youth found that time spent outdoors was a consistent positive determinant of child PA levels (Ferreira et al., 2007). Furthermore, despite general declining trends in PA participation, research suggests that leisure time PA appears to be increasing over time (Knuth & Hallal, 2009).

Many neighborhood environmental variables can affect leisure time PA. This has been especially apparent in children due to increased susceptibility to environmental mobility barriers and consistent concerns regarding parental and youth perceptions of safety, proximity, and access (Veitch, Salmon, & Ball, 2010). Neighborhood environmental factors thought to influence childhood PA and/or obesity levels include socioeconomic deprivation, inadequate housing, safety concerns, lack of street lights or sidewalks, land use diversity, street connectivity, residential density, and access to parks, playgrounds, and recreational facilities to name a few (Davison & Lawson, 2006; Ferreira et al., 2007; Kligerman, Sallis, Ryan, Frank, & Nader, 2007; Roemmich et al., 2006; Singh, Siahpush, & Kogan, 2010).

### Parks and Physical Activity

Within social ecological PA research and promotion, parks have been viewed as potential settings for PA that can have a positive impact on public health (Bedimo-Rung, Mowen, & Cohen, 2005) due to their relatively low cost and ability to reach a large number of youth (Moody et al., 2004). Sallis and Glanz (2006) concluded that to reduce or prevent childhood obesity, children need access to places where they can be physically active. Research indicates that the most important places are outdoors in neighborhoods, public parks, and commercial facilities (Sallis & Glanz, 2006). Indeed, a review of physical environment literature concluded that multiple studies demonstrated a positive association between children's PA and public recreational infrastructure

including school yards, playgrounds, and open space parks (Davison & Lawson, 2006). Another study found that having a recreational or open space within 1 km of home was the strongest variable across age groups related to increased walking amongst youth (Frank, Kerr, Chapman, & Sallis, 2007). Epstein et al. (2006) examined substituting PA behavior for sedentary behavior (screen time) and found that greater access to parks was associated with increased PA when screen time was limited (Epstein et al., 2006).

A variety of park variables, including proximity, size, access, features, condition, and safety, have been shown to be associated with youth PA participation. For example, Roemmich et al. (2006) found that a greater proportion of park area within a half mile a youth's residence was associated with increased levels of child PA (Roemmich et al., 2006), while another study found that park area was positively related to children's park usage (Loukaitou-Sideris & Sideris, 2010). Timperio and colleagues (2004) concluded that perceptions regarding existence of nearby parks were associated with increased youth PA. Scott et al. (2007) also found that perceived ease of access to recreational facilities (e.g., playing fields, tennis courts, etc) was positively correlated with increased PA among adolescent girls. Another study of adolescent girls found that a greater number of nearby parks was associated with increased levels of PA (Norman et al., 2006). However, in contrast, qualitative studies of places that children play found that parents were willing to drive to parks farther away if they had appealing qualities or features (Tucker, Gilliland, & Irwin, 2007; Veitch et al., 2006). Park access also may be associated with youth park-based PA, possibly due to mobility barriers that children face. For example, parents may have concerns in letting their child access a park if it is too far from home or if they have to cross a busy intersection to get there (Veitch et al., 2006). Overall, research indicates that both proximity and access augment nearby youth PA.

Proximity and access are not the only park related variables that can facilitate PA. Within parks, research shows that specific programs, features, and quality are associated with PA. Amongst urban youth, perceptions of park access, quality, and utilization by friends were significant determinants for park-based PA (Ries et al., 2009). Potwarka, Kaczynski, & Flack (2008) found that children with a playground within 1 km of their home were significantly associated with a healthier weight status, while Cohen et al. (2006) concluded that adolescent girls were more likely to participate in moderate to vigorous PA if they lived near more parks, especially parks with amenities that encourage walking. Another study found that active recreation facilities, sports programs, presence of natural features, and good maintenance and cleanliness were the most important factors attracting children to parks (Loukaitou-Sideris & Sideris, 2010).

Additionally, both parent and child safety concerns present a barrier to youth PA. One study of Mexican-American girls found that violent crime could be a significant barrier to outdoor PA (Gomez, Johnson, Selva, & Sallis, 2004), while another found that having access to a safe park was positively correlated with regular PA among adolescents in urban areas (Babey, Hastert, Yu, & Brown, 2008). However, a recent study found no association between objective or perceived neighborhood crime and park-based PA in adolescents (Ries et al., 2009).

#### Disparities in Park Utilization

Research indicates that children do not utilize parks equally. Differences exist in sex and age for youth park-related PA. Studies indicate that boys are more likely to be physically active in parks than girls (Epstein et al., 2006; Moody et al., 2004). Additionally, while one study showed that playground equipment is equally reinforcing for younger boys and girls (Roemmich et al., 2006), another study indicated that playground equipment is mostly designed for toddlers and that middle school aged children found parks boring (Veitch et al., 2006).

Another significant issue in utilization of parks may be demographic and socioeconomic neighborhood disparities in access to environmental resources that facilitate PA. Specifically, disparities in availability and access to parks and recreation areas have been recognized as an important research endeavor (Taylor, Floyd, Whitt-Glover, & Brooks, 2007). Several studies have concluded that areas with higher minority and/or low income populations generally have fewer parks and recreation spaces (Estabrooks, Lee, & Gyurcsik, 2003; Moore, Diez Roux, Evenson, McGinn, & Brines, 2008; Powell, Slater, Chaloupka, & Harper, 2006). Additionally, several youth studies have examined neighborhood disparities in park accessibility and have reported similar trends (Babey, Hastert, & Brown, 2007; Gordon-Larsen, Nelson, Page, & Popkin, 2006).

#### Statement of the Problem

Overall, a growing body of evidence suggests that parks play an important role in youth PA. Relatively few studies have examined how parks influence youth PA. For example, Kaczynski and Henderson (2007) reviewed 50 park and recreation studies, but only 8 were focused on associations with youth PA. Moreover, parks can vary greatly in size, features, and condition, while environmental barriers (e.g., busy streets) can inhibit park use. Therefore, it is necessary to evaluate park and neighborhood determinants of PA. Despite prior research, few studies have comprehensively examined how attributes such as park proximity, access, features, quality, and the surrounding neighborhood are associated with youth PA levels.

#### Purpose of the Study

To enhance this important area of research, this study will involve detailed park audits and surveys of neighborhood residents surrounding each park in order to increase understanding of the relationship between parks and youth PA. The primary purpose of this study is to examine the association of park characteristics with the PA levels of nearby youth. Better understanding the

ways in which park and neighborhood characteristics are associated with PA among children can inform future research and environmental and policy changes aimed at improving the use of open spaces and reducing obesity amongst youth. Specifically, two related research questions will be explored:

1. Is park proximity associated with nearby youth achieving recommended levels of physical activity?
2. Which park features are associated with nearby youth achieving recommended levels of physical activity?

## *Chapter 2*

### REVIEW OF LITERATURE

#### Background

Increasing trends in childhood obesity combined with decreasing levels of PA have created an enormous concern for public health officials (NCCDPHP, 2010a; NCCDPHP, 2010b). Obese children are more likely to be obese as adults and have greater risk for numerous health issues including diabetes, heart disease, and premature mortality (Freedman et al., 2001; USDHHS, 2009). Sufficient PA can significantly reduce risk of childhood obesity. However, only about one third of today's youth are meeting recommended PA guidelines (Eaton et al., 2008). Moreover, national trends indicate an overall decrease in youth PA that worsens with age (Belanger et al., 2009; Eaton et al., 2008).

#### Environmental Correlates of Physical Activity

According to ecological approaches to active living, multiple social and physical environmental variables influence our decisions to participate in PA (Sallis et al., 2006). Although individual behavior modification is widely studied, there is limited explanatory power of individual approaches to increasing PA. Individual factors can explain only about 30% of the variance, while 70% of variance comes from other sources (Sallis, Owen, & Fisher, 2008). Built environment research is a fairly new concept, but has the potential to generate broader, more permanent effects (Sallis & Glanz, 2006). Therefore, PA research paradigms have recently refocused from individual attributes and behavioral-based interventions to a broad ecological approach encompassing both social and environmental factors (Ferreira et al., 2007).

Multiple neighborhood environmental variables are associated with childhood PA and hence obesity rates among youth. In a study of neighborhood socioeconomic and built environment



variables, Singh and colleagues (2010) examined data from the 2007 National Survey for Children's Health for 91, 642 children aged birth to seventeen years. They looked at the combinations of both social and physical environmental factors with childhood obesity rates and reported that children in neighborhoods lacking access to sidewalks, parks, playgrounds, and recreation centers were at 20-45% increased odds of overweight and obesity than children with such access (Singh et al., 2010). Furthermore, they found that these effects were greater for females and young children. Another study of ninety-eight White or Mexican American adolescents, median age 16.2 years, evaluated neighborhood characteristics and found similar results (Kligerman et al., 2007). Specifically, the authors evaluated neighborhood "walkability" correlates such as land use diversity, residential and commercial density, and street connectivity within a half mile radius and found a positive association with minutes of moderate to vigorous PA for White and Mexican American adolescents. However, this particular study did not find an association between environmental variables and body mass index, nor were specific recreation variables related to amount of PA (Kligerman et al., 2007). On the other hand, Roemmich et al. (2006) examined access to parks and recreational facilities and youth PA in 59 children aged four to seven years. In comparing objective accelerometer data from three weekdays and one weekend day with GIS measurements of neighborhood environmental variables, they found that both greater neighborhood park area and increased residential housing density were associated with increased child PA levels (Roemmich et al., 2006). Several other studies acknowledge that built environmental factors (e.g., urban sprawl, land use, public resources) can play an influential role in youth PA (Dunton, Kaplan, Wolch, Jerrett, & Reynolds, 2009; Galvez, Pearl, & Yen, 2010; Razani & Tester, 2010).

## Parks and Physical Activity

Within the broader built environment literature, parks are recognized as important influences on PA. In fact, in a summary of built environmental contributions to childhood obesity, Sallis and Glanz (2006) discuss strategies for environmental change stating that “strongest evidence links access to recreational facilities and programs with child and adolescent PA”. A Report on Recommendations of the Task Force on Community Preventive Services on increasing PA strongly recommends the creation of or enhanced access to places to be physically active (e.g., parks) (Centers for Disease Control and Prevention [CDC], 2001). Parks, specifically, have been acknowledged as important for promoting PA (Kaczynski & Henderson, 2007; Moody et al., 2004; Potwarka, Kaczynski, & Flack, 2008) and have enormous potential to improve the health of large populations (Mowen, Kaczynski, & Cohen, 2008).

The significance of park-related PA to overall public health was apparent to Bedimo-Rung and colleagues (2005), who suggested that benefits of park use include social, psychological, environmental, economic, and health dimensions. They discussed multiple correlates of park use relating to PA levels and summarized results with a model (Figure 1). This model forms a conceptual basis for studying neighborhood and specifically park characteristics related to PA. It identifies six conceptual areas and four geographic areas that are important to consider. Conceptual areas include features, condition, access, esthetics, safety, and policies. The four geographic areas include activity areas, supporting areas, overall park, and surrounding neighborhoods (Bedimo-Rung et al., 2005).

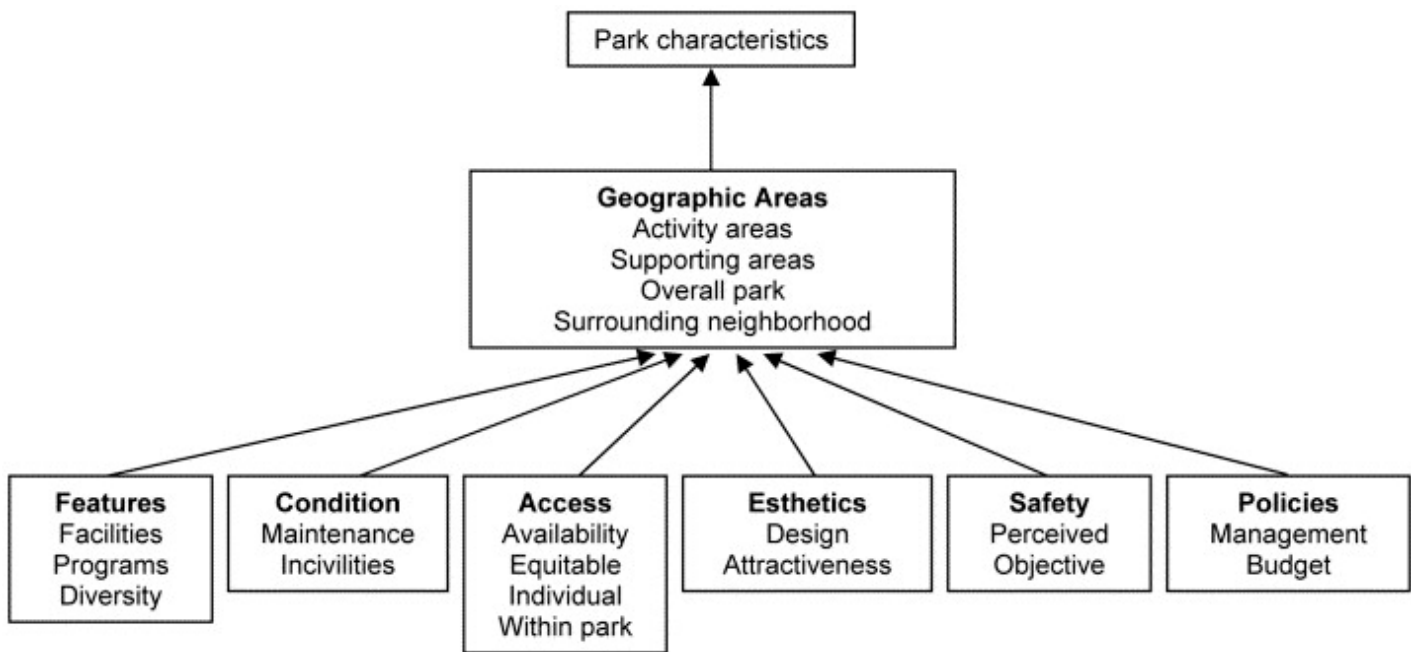


Figure 1. Environmental classification of park attributes. (Bedimo-Rung et al., 2005).

Another conceptual model identifying objective and subjective variables for youth park-based PA is shown in Figure 2. This model by Loukaitou-Sideris and Sideris (2010) divides characteristics into three categories: neighborhood characteristics (e.g., crime rates, population size and density, racial composition), park characteristics (e.g. park size, active recreation facilities, condition), and user characteristics/behavior (e.g., age, race/ethnicity). Although similar to the first model, Figure 2 explicitly focuses on youth PA, identifying specific characteristics to explore.

Indeed, several studies show a positive relationship between neighborhood park variables and youth PA. A review by Davison and Lawson (2006) of twenty-one studies explored the association of PA with recreational infrastructure in youth age three to eighteen. They found an overall positive association between recreational infrastructure (most commonly school yards, playgrounds, and open space parks) and children’s PA. A study by Moody and colleagues (2004) also explored the potential of parks to promote youth PA. Their survey of public park and recreation directors assessing PA programming for 3-17 year olds in San Diego County found that an average of 373 youths participated in recreation center-based PA for a given weekday. They

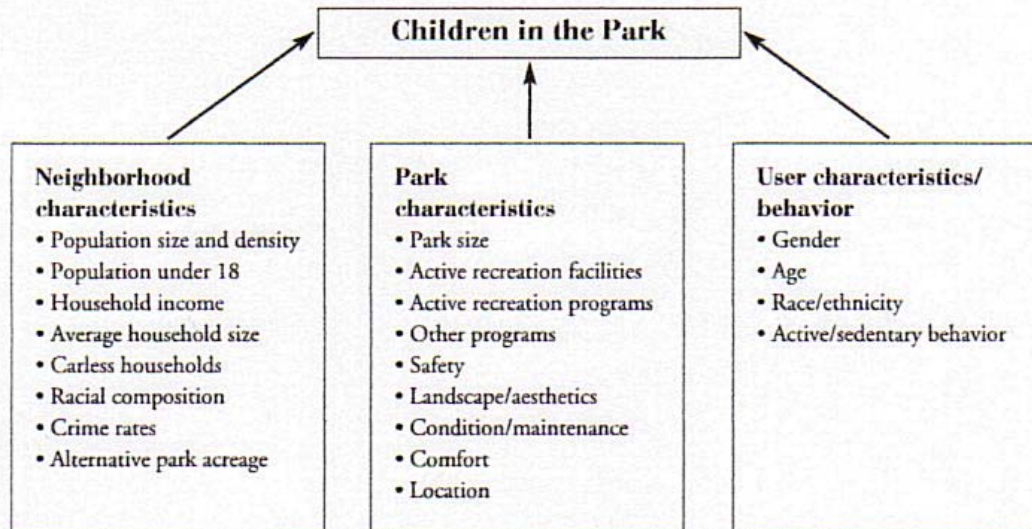


Figure 2. Conceptual model: Objective and Subjective Variables for Youth Park-Based Physical Activity (Loukaitou-Sideris & Sideris, 2010).

concluded that parks and recreation centers had the potential to positively impact PA for a large number of youth (Moody et al., 2004). The following sections explore various dimensions of parks that have been examined in relation to youth PA.

### *Park Proximity*

In examining park-related PA literature, park proximity consistently appears to be a major contributing factor. Kaczynski and Henderson (2007) reviewed 50 studies examining park and recreation correlates of PA, most including a measure of proximity. They found that 40 out of 50 studies indicated at least some positive correlations, and that proximity to parks was generally related to increased levels of PA (Kaczynski & Henderson, 2007). Roemmich et al. (2006) concur that proximity to parks has strong associations with PA, as they found that greater proportion of park area within ½ mile was associated with increased levels of youth PA. Another study examined travel diary data from over 3000 adolescents in Atlanta and found that having at least one recreation or open space within 1 km of home was the built environment aspect most related to

both frequency (at least once over two days) and duration (greater than .5 miles) of walking in youth (Frank et al., 2007).

The total number of parks was also strongly represented in the literature, likely due to its relationship with proximity. A study examining the relationship of both perceived and objectively measured number and proximity of parks found a positive association for youth PA (Scott, Evenson, Cohen, & Cox, 2007). Perceptions of 1,367 sixth grade girls along with GIS objectively measured PA sites within 1 mile of participants' homes indicated that the number and proximity of recreational facilities were associated with increased PA. Likewise, a study by Norman et al. (2006) used accelerometers to measure the PA of 799 adolescents, ages eleven to fifteen, and GIS to measure access to recreational variables within 1 mile of participants' homes. Their results indicated that number of parks and recreational facilities was positively associated with PA in girls.

#### *Park Features*

Research also indicates that within parks, the presence and quality of specific features, as well as factors such as cleanliness, and programming, can influence PA. Indeed, one prominent study among adults reported that the number of features in a park was more important than its size or distance from study participants (Kaczynski, Potwarka, & Saelens, 2008). Furthermore, park facilities were more important than amenities, and specifically park trails had the highest odds of predicting PA.

In youth, a study utilizing direct observation of 100 parks along with a survey of 897 children and 348 parents assessed variables that bring children to the park and had similar results (Loukaitou-Sideris & Sideris, 2010). The authors hypothesized that both objective and subjective variables affected youth park use. They found that playgrounds, including slides and swings, were utilized most often by girls, while boys most frequently reported using playing fields, including

soccer fields, basketball courts, and baseball or softball diamonds. Again, park area was found to be positively associated with park usage for youth (i.e., larger parks tended to attract more children). Overall, while middle school aged youth showed little interest in park-based PA, the most important factors related to park usage were active recreation facilities and sports programs, presence of natural features, and good maintenance and cleanliness (Loukaitou-Sideris & Sideris, 2010).

Other research indicates that different park variables can have different effects. A qualitative examination of perceptions among 78 parents found playgrounds and equipment to be important. However, they commented that those were mostly designed for younger children and that older children found parks “boring” due to a lack of engaging equipment making certain parks unappealing for parents with children of various ages (Veitch et al., 2006). Also, contrary to previous research on park proximity, parents in the study indicated a willingness to drive to parks farther away if they had desirable facilities. Similarly, another study by Tucker, Gilliland, and Irwin (2007) interviewed 82 parents at parks in Ontario regarding park utilization, proximity, and likes/dislikes. Approximately half of those interviewed traveled more than 4 km to a park of their choice, indicating that park location was not as important as amenities. The main reasons for choosing a park included water attractions, shade, swings, and cleanliness (Tucker et al., 2007).

A study by Cohen and colleagues (2006) used accelerometer data from 1556 sixth grade girls to examine associations of PA with park proximity, type and features. They found that girls who live within ½ mile of parks with playgrounds, basketball courts, multi-purpose rooms, walking paths, swimming areas, and tracks had higher amounts of PA. Additionally, park amenities such as streetlights, floodlights, shaded areas, and drinking fountains were related to increased PA in adolescent girls (Cohen et al., 2006). Potwarka and colleagues (2008) examined

the relationship between availability of thirteen specific park facilities in 52 parks with the body mass index of 108 children aged two to seventeen. Their findings indicated that park playgrounds within 1 km of the children's home were a significant predictor of being a healthy weight. Children who had such amenities nearby were five times more likely to have a healthy body mass index. However, no associations with children's weight status were found for park proximity variables – distance to the closest park, number of parks within 1 km, or amount of park area within 1 km (Potwarka et al., 2008).

#### *Park and Neighborhood Safety*

Other studies have explored the extent to which perceived and objectively measured park and neighborhood safety may present barriers to youth PA. A study by Gomez and colleagues (2004) examined density of neighborhood violent crimes, distance to the nearest open play space, and outdoor PA in 177 mostly Mexican American seventh graders. Their results indicated that violent crimes presented a significant barrier to outdoor play for Mexican American girls (Gomez et al., 2004). Similarly, a study by Babey et al. (2008) of 4010 California adolescents, ages 12 to 17 examined the relationship between PA and access to a safe park across various neighborhood and socioeconomic status variables. Their findings indicate that among urban youth, access to a safe park was positively associated with regular PA (Babey et al., 2008).

However, a study by Ries and colleagues (2009) of 329 adolescents in Baltimore found no associations between objective or perceived neighborhood crime and park-based PA. Using a web based survey of students' perceptions, accelerometers, and GIS measures of park availability and crime, they found that the increased likelihood of adolescent park use was positively associated with perceptions of greater park availability, quality, and use by peers, but no associations were found for perceived or objectively measured crime (Ries et al., 2009).

## Summary

Both objective and subjective measures have evaluated parks and the neighborhoods surrounding parks, but the majority of studies are focused on adults. Limited research has evaluated neighborhood levels of PA in youth and the presence/condition of youth-specific park features (age-related play equipment or areas, parental support features, etc). Moreover, existing literature has reported mixed results. A review of environmental correlates of PA indicated that proximity to parks was generally associated with increased PA for adults, but that the relationship between parks and youth PA had been studied less often (Kaczynski & Henderson, 2007). Additional studies are needed to better understand park-related correlates of youth PA.

Overall, a growing and convincing body of evidence increasingly indicates that parks play a vital role in youth PA. However, the majority of studies to date have examined simple proximity to parks and more often have focused on adult populations (Kaczynski & Henderson, 2007). Parks can vary in size, features, and condition. According to several researchers, studies concerning parks “have generally by default considered all parks and playgrounds to have the same elements and qualities, despite the awareness that they may differ substantially on these characteristics” (Saelens et al., 2006). The research reviewed in this chapter indicates that park and neighborhood environmental variables can influence children’s use of parks. However, only a small number of studies have individually examined factors such as proximity, features, and access. Therefore, this study will examine the association between park environmental correlates and the PA of nearby youth. In particular, it will explore how park proximity and park features (e.g., facilities and amenities) are associated with nearby youth achieving recommended levels of PA.



### *Chapter 3*

## METHODOLOGY

This cross-sectional study involved three integrated components. The first component utilized geographic information system (GIS) technology to gather exposure data regarding the availability and size of parks in neighborhoods across Kansas City, Missouri. The second component included audits of 146 parks in order to gather exposure data on park attributes such as facilities, amenities, and condition. Lastly, a survey was mailed to randomly selected households in the neighborhoods surrounding each park to gather information about youth PA behavior as well as neighborhood perceptions and park use. The following sections describe the study setting, sampling and data collection, measures, and analyses.

### Study Setting

This study took place in Kansas City, Missouri (KCMO). The City of Kansas City, Missouri encompasses 318 square miles in Jackson, Clay, Cass, and Platte counties and is the largest city in Missouri with an estimated population of 475,830 (KCMO, 2009). KCMO forms the anchor for the Kansas City Metropolitan Area that spreads into Kansas and has an estimated population of close to 2 million. U.S. Census Data from 2000 indicate that 51.7% of the population is female while 48.3% are male. KCMO has abundant racial diversity with a mix of white (57.6%), black (31.2%), Hispanic (6.9%), other (3.2%), American Indian (1.2%), and Vietnamese (0.7%) residents. Approximately 2.4% of the population is of two or more ethnicities (City Data, 2009). KCMO has a wide age range of residents, with approximately 28% under the age of 20, 52% between 20-54 years old, and 20% being 55 years and older (U.S. Census Data, 2000). Specific to this study's target population, this translates into around 133,232 youth under the age of 20 in the

city of Kansas City, Missouri alone relying on local park and recreation services for PA opportunities.

The Kansas City Missouri Parks and Recreation Department (KCMO PARD) manages and maintains approximately 12,000 acres of parkland, including 219 parks, 132 miles of boulevards and parkways, 47 fountains, 87 ornamental structures, 10 community centers, 27 lakes, 38 miles of trails and bikeways, 105 tennis courts, five golf courses and four museums (KCMO PARD, 2009). The 219 parks are divided among three main regions - north, central, and south, as shown in Figure 3. KCMO

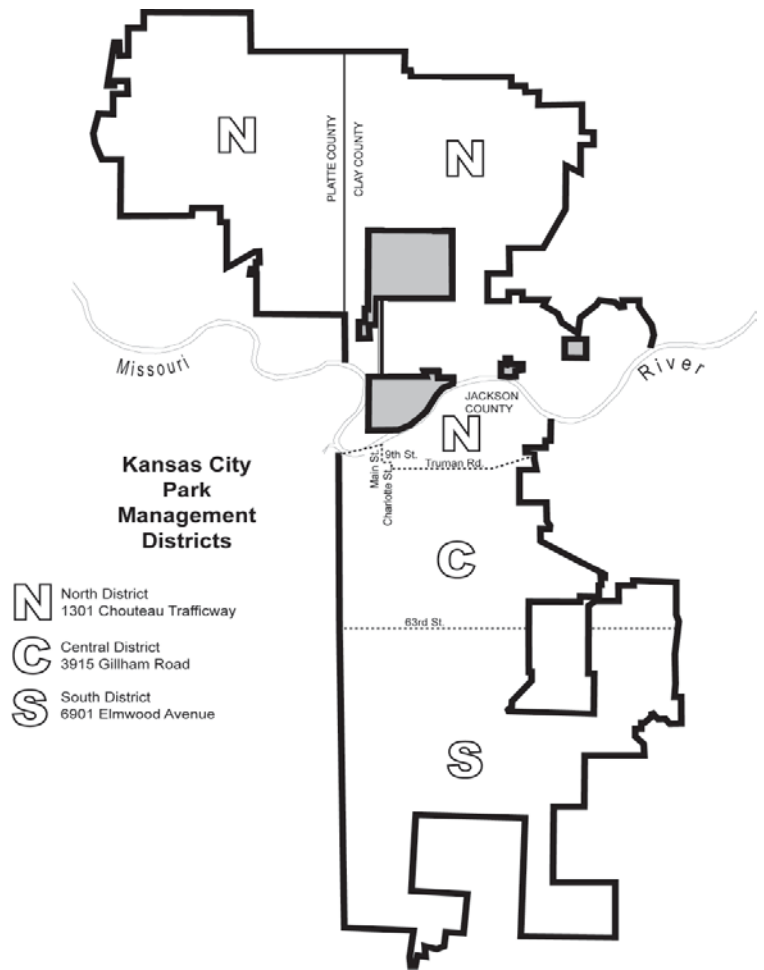


Figure 3. Map of KCMO Park Districts

PARD has received national recognition for its beautiful parks and is committed “to improving the quality of life by providing recreational, leisure and aesthetic opportunities for all residents, and by conserving and enhancing the environment” (KCMO PARD, 2009).

### Sampling and Data Collection

This study was conducted concurrently with a project funded by the Robert Wood Johnson Foundation’s Active Living Research (RWJF ALR) program to develop the Community Park Audit Tool (CPAT), a user-friendly measurement tool that enables diverse stakeholders to quickly and reliably audit community parks for their potential to promote youth PA (Kaczynski & Wilhelm

Stanis, 2009). A key component of the RWJF ALR study was to test the CPAT in a wide variety of parks with a diverse group of community stakeholders. The current study piggybacked on the RWJF project by surveying households living within ½ mile of that study's main parks in order to obtain information about youth PA behavior.

This study began with the 60 parks utilized in the RWJF ALR project that were selected to represent a diverse mix of quality, size, and features, as well as being geographically dispersed across Kansas City, Missouri. Given the multiple locations included in this study, a probability cluster sampling technique was used to identify the study sample. Specifically, the sampling frame of potential survey respondents was created by initially identifying all census blocks within ½ mile of each park. A random sample of approximately 66 addresses from each cluster of blocks was purchased from a market research company (Survey Sampling International). The final starting sample included a total of 3906 households.

Mail surveys have a number of benefits in that they can efficiently and economically collect data from a large number of people, offer anonymity to responders which may increase truthfulness in answering, and can be filled out at the convenience of the participant (Vaske, 2008). However, surveys have limitations such as low response rates. In a qualitative review, Harvey (1987) found that follow-ups, preliminary notification, stamped reply envelopes, and monetary incentives were important factors for increasing response rates. This study incorporated several of these strategies within a modified Dillman mailing protocol (Dillman, 2000), including four waves of survey mailings and a reminder postcard. The preliminary mailing included a cover letter (Appendix B), the full survey instrument (Appendix C), a prepaid return envelope that was coded to aid in response tracking, and a complimentary parks and recreation community center pass. The cover letter introduced the study and included an endorsement by the local government and

described the participant's eligibility to win one of ten \$50 prize incentives upon survey completion. Approximately one week later, a reminder post card was sent to all selected participants. After another 2 weeks, a second wave of surveys was mailed out to all non-responding addresses. After an additional 3 weeks, a third package with the same contents was mailed out. With response rates still somewhat low, a shortened version of the survey (that included pertinent youth-related questions) was mailed out a week later as part of the fourth wave protocol (Appendix D). In order to reduce possible discrepancies between exposure and outcome data, survey distribution and the majority of park audits were conducted simultaneously within a 30-60 day time period.

## Measures

### *Park Proximity*

As some research suggests, proximity to parks can be examined in multiple ways (Kaczynski & Henderson, 2007; Lachowycz & Jones, 2011). This study measured proximity with three variables: distance to the closest park, total number of parks, and total park acreage. A GIS shape file of the KC park system was initially obtained from the city of Kansas City, Missouri. GIS (ArcView 9.3) was utilized to calculate network distances to all of the parks within 1 mile of each household using the household address and the centroids of the parks. Network distance measures to an area centroid have been shown to be a more precise measure of park proximity than using Euclidian distances (Oh & Jeong, 2007; Lee & Moudon, 2008). All parks were visited (described further below) to determine that they were accessible and useable for physical activity. The shape file and the list of parks within 1 mile of each household was then edited to exclude non-useable parks. A variable was created to indicate whether the youth had a park within ¼ mile (yes/no), ½ mile (yes/no), and 1 mile (yes/no). As well, the total number of parks within ¼ mile, ½ mile, and 1

mile was calculated. Finally, the total number of acres of park space within ¼ mile, ½ mile, and 1 mile was also calculated. Total acreage for a park was included if the centroid of the park fell within the specified distance.

### *Park Characteristics*

All of the parks within 1 mile of study households (n=146 parks) were audited using the CPAT. Park audits of the original 60 parks were completed by pairs of community stakeholders as part of the RWJF ALR project. However, due to the dispersion of survey responses, an additional 86 parks were audited by two trained research assistants to ensure that all parks within 1 mile of respondents' homes were included (as suggested by Veitch et al., 2011). All auditors completed a CPAT training workshop, practiced auditing at least one park, and were given a CPAT guidebook for field use.

The CPAT is a comprehensive audit tool that is six pages long and contains four sections: park information, access and surrounding neighborhood, park activity areas, and park quality and safety (Appendix A). In field testing with pairs of community stakeholders, the CPAT demonstrated a very high degree of inter-rater reliability for the vast majority of the items in the tool (i.e., percent agreement between the two auditors exceeded 70%, with most items well above 80% or higher).

The CPAT provided in-depth information regarding the presence/absence of 14 park facilities (playgrounds, sports fields, baseball fields, swimming pools, splash pads, basketball courts, tennis courts, volleyball courts, trails, fitness stations, skate parks, dog parks, green spaces, and lakes) and 25 amenities (transit stops, car parking, bike racks, sidewalks, external trails, bike lanes, traffic signals, restrooms, drinking fountains, benches, picnic tables, picnic shelters, grills, trash cans, vending machines, shade, rules posted about animals, animal waste bags, lights, park monitored, emergency devices, threatening behaviors, neighborhood visibility, roads through the

park, and dangerous spots). The resulting data were then dichotomized into parks having or not having a specific feature. Park facility and amenity variables were then created for all youth indicating whether or not they had a park containing each feature within ½ mile and 1 mile of their home.

### *Survey of Neighborhood Residents*

Data from study participants were gathered via a survey that was 6 pages front and back in length that captured participant demographics, PA behavior, and neighborhood perceptions, among other information (Appendices C, D). The socio-demographic data collected included information to calculate parent and youth body mass index, race/ethnicity, gender, age, and income.

In another part of the survey, the adult respondent was asked to report youth PA data for one child (ages 3-17 and living at home) whose birthday was next in the calendar year. Previous studies have indicated that there is strong agreement between child-reported and proxy-reported moderate to vigorous PA information (Dowda et al., 2007; Sallis & Saelens, 2000; Welk, Corbin, & Dale, 2000). Youth PA participation was measured via a parental proxy survey question validated by Prochaska et al. (2001) asking the following: *Thinking about the child's moderate to vigorous physical activities, over the past 7 days, on how many days was this child moderately to vigorously active for a total of at least 60 minutes per day?* Resulting PA data were then dichotomized into meeting (five or more days per week) or not meeting (less than five days per week) national PA recommendations for youth (Prochaska et al., 2001).

Additionally, using data from the Kansas City, Missouri police department, neighborhood crime was measured by aggregating the total of nine different crimes (homicide, rape, robbery, aggravated assault, burglary, stealing, stolen auto, non-aggravated assault, and arson) for each census tract that contained a study household.

## Analyses

Numerous analyses were conducted to address the proposed research questions and to explore how park environments are related to youth PA. For the first research question, binary logistic regression was used to examine the association between all park proximity variables (closest park, number of parks, and total park acreage within ¼ mile, ½ mile, and 1 mile boundaries) and the odds of youth achieving recommended levels of PA. Regarding number of parks and park space proximity variables, multiple analyses were conducted to compare between subgroups (i.e., using both 0 parks within ½ mile and 1 park within ½ mile as the reference group). To address the second research question, binary logistic regression was used to determine the odds of youth meeting PA recommendations based on whether a youth had each park facility and amenity within ½ mile and 1 mile from home. All analyses controlled for gender, age, race, income, body mass index, and neighborhood crime. Findings were considered significant at  $p < .05$ .

## *Chapter 4*

### RESULTS

This chapter will present the study's findings regarding associations between park proximity and features and PA levels of youth. Initially, descriptive information is provided, including the survey response rate, sample distribution, sample characteristics, and youth PA participation. This section will then describe the results of analyses for each research question, including associations between proximity and features variables and the likelihood of youth meeting PA recommendations.

#### Response Rate and Distribution

As described in chapter three, a total of 3906 neighborhood and park surveys were mailed out across Kansas City, Missouri. Of those surveys, 649 were returned by the postal service as undeliverable. An additional eight surveys were returned blank. In total, 893 surveys were returned partially or fully completed. This resulted in an overall response rate of 27.4% ( $893/(3906-649)$ ). This response rate is comparable to the 21% reported by Tilt (2010) in another recent mail survey study about parks and neighborhood-based PA. Of the completed surveys, 229 respondents indicated that there was a child between the ages of three and seventeen living in the household. However, 38 surveys were missing youth PA data, leaving a total of 191 valid responses for the present analyses. These youth were distributed across 85 census tracts in Kansas City, Missouri for an average of 2.2 youth per tract and a median of 1.5 youth per tract. Because 42 of the 85 census tracts (49%) had only one youth, it was determined that multilevel modeling to account for clustering effects was not warranted.



## Sample Characteristics

In this study, the youth sample was fairly representative of the Kansas City population with respect to gender, race, and income. Table 1 provides information regarding characteristics of the youth in the sample. Of the 191 youth, there were similar numbers of males (49.5%) and females (50.5%), with three having no gender specified. These percentages reflect previously reported gender statistics for all of Kansas City, Missouri, where females comprise a slightly greater percentage (51.7%) of the population (U.S. Census Data, 2000). Children ages 3-5 years comprised 14.4% of the sample, adolescents ages 6-12 years accounted for 54.3%, and teens 13-17 years encompassed 31.4%. The mean age for the full youth sample was 10.36 years ( $SD = 4.00$ ), with 10.62 years ( $SD = 3.83$ ) for males and 10.19 years ( $SD = 4.13$ ) for females. The mean body mass index across all youth was 20.95 ( $SD 4.86$ ), with a total of 24.4% being obese ( $n=40$ ). This was slightly higher than nationwide statistics stating approximately 17% of children and adolescents aged 2-19 years are obese (CDC, 2011). There were a slightly higher percentage of males that were overweight (20.0%) as compared to females (11.9%), but a greater percentage of females were obese (27.4%) as compared to males (21.3%).

The pattern of racial and ethnic distribution was similar to that of the entire Kansas City, Missouri population (City Data, 2009). Approximately 8.6% of youth were of Hispanic origin, with the percentage for males (9.8%) slightly higher than females (7.4%). With respect to race, the majority of the youth sample was White (60.0%), followed by Black (26.5%), Asian (4.9%), Other (3.2%), American Indian/Alaska Native (1.6%), and 3.8% marking 2 or more races. When all non-White races (Black, Asian, American Indian/Alaska Native, and Other) were aggregated together, they comprised 36.2% of the youth sample.

*Table 1*  
*Descriptive Characteristics of Youth in Sample*

Youth Characteristics	Total		Male		Female	
	n	%	n	%	n	%
Total Sample	191	100.0%	93	49.5%	95	50.5%
Age (yrs)						
Child (3-5)	27	14.4%	12	13.0%	14	14.7%
Adolescent (6-12)	102	54.3%	51	55.4%	51	53.7%
Teen (13-17)	59	31.4%	29	31.5%	30	31.6%
Mean	10.36	(SD 4.00)	10.62	(SD 3.83)	10.2	(SD 4.13)
Body Mass Index						
Underweight	4	2.4%	3	3.8%	1	1.2%
Normal	94	57.3%	44	55.0%	50	59.5%
Overweight	26	15.9%	16	20.0%	10	11.9%
Obese	40	24.4%	17	21.3%	23	27.4%
Mean	20.95	(SD 4.86)	21.01	(SD 4.79)	20.9	(SD 4.96)
Ethnicity						
Hispanic	16	8.6%	9	9.8%	7	7.4%
Non-Hispanic	171	91.4%	83	90.2%	87	92.6%
Race						
American Indian/ Alaska Native	3	1.6%	3	3.3%	0	0.0%
Asian	9	4.9%	4	4.4%	5	5.4%
Black	49	26.5%	23	25.3%	26	28.0%
Native Hawaiian/ Pacific Islander	0	0.0%	0	0.0%	0	0.0%
White	111	60.0%	55	60.4%	56	60.2%
Other	6	3.2%	4	4.4%	2	2.2%
2 or more races	7	3.8%	2	2.2%	4	4.3%
White	111	60.0%	55	60.4%	56	60.2%
Non-White	67	36.2%	34	37.4%	33	35.5%
2 or more races	7	3.8%	2	2.2%	4	4.3%
Household Income						
< \$25,000	25	13.7%	12	13.3%	13	14.3%
\$25,000-\$74,999	82	45.1%	41	45.6%	40	44.0%
>\$75,000	75	41.2%	37	41.1%	38	41.8%

Note: Numbers in cells do not always sum to total because certain demographic data were missing for some youth.

In this study, youth were divided into three household income categories. Approximately 13.7% of the youth households fell into the low income category (less than \$25,000/year), 45.1% were moderate (\$25,000-\$74,999/year), and 41.2% had a high household income (greater than \$75,000/year). This distribution is similar to that of Kansas City, Missouri which has a median household income of \$39,230 and 14% of residents at or below the poverty line (U.S Census Data, 2000).

Adult survey respondents also indicated the number of days per week that the selected youth in the household was physically active for at least 60 minutes per day. These PA data were then dichotomized into meeting (five or more days per week) or not meeting (less than five days per week) national PA recommendations for youth. Table 2 shows that less than half of youth met recommendations (46.6%), with males (47.3%) having a slightly greater percentage than females (45.3%). These results are slightly higher than 2007 YRBSS statistics where only 34.6% of students met recommendations, but they are similar with respect to the gender differences (Eaton et al., 2008).

*Table 2*  
*Number of Youth Meeting Physical Activity Recommendations*

Physical Activity Level	Total		Male		Female	
	n	%	N	%	n	%
Meets PA Recommendations	89	46.6%	44	47.3%	43	45.3%
Does Not Meet PA Recommendations	102	53.4%	49	52.7%	52	54.7%

Note: Numbers do not always sum to total because certain demographic data were missing for some youth.

### Park Proximity

The first research question examined the association between park proximity and youth PA. Proximity was examined with three variables: distance to the closest park, total number of parks, and total park acreage. Table 3 depicts the descriptive proximity characteristics for the youth

sample. Approximately 13.1% had a park within a quarter mile, 39.3% were within a half mile of a park, and 78.5% had their closest park within one mile. Across all closest park categories, males showed slightly higher percentages than females indicating overall greater proximity.

*Table 3*  
*Park Proximity Descriptives*

Park Proximity Variable	Total		Male		Female	
	n	%	n	%	n	%
<b>Closest Park<sup>a</sup></b>						
¼ mile or less	25	13.1%	14	15.1%	10	10.5%
½ mile or less	75	39.3%	43	46.2%	31	32.6%
1 mile or less	150	78.5%	78	83.9%	69	72.6%
<b>Number of Parks</b>						
½ mile - 0 parks	115	60.2%	50	53.8%	63	66.3%
½ mile - 1 park	57	29.8%	32	34.4%	24	25.3%
½ mile - 2 or more parks	19	9.9%	11	11.8%	8	8.4%
1 mile - 0 parks	41	21.5%	15	16.1%	26	27.4%
1 mile - 1 park	50	26.2%	25	26.9%	24	25.3%
1 mile - 2 parks	42	22.0%	21	22.6%	20	21.1%
1 mile - 3 or more parks	58	30.4%	32	34.4%	25	26.3%
<b>Park Space</b>						
¼ mile - 0 acres	166	86.9%	79	84.9%	85	89.5%
¼ mile - 0.1- 4.9 acres	13	6.8%	7	7.5%	6	6.3%
¼ mile - 5 or more acres	12	6.3%	7	7.5%	4	4.2%
½ mile - 0 acres	115	60.2%	50	53.8%	63	66.3%
½ mile - 0.1- 9.9 acres	34	17.8%	20	21.5%	14	14.7%
½ mile - 10-19.9 acres	23	12.0%	13	14.0%	10	10.5%
½ mile - 20 or more acres	19	9.9%	10	10.8%	8	8.4%
1 mile - 0 acres	41	21.5%	15	16.1%	26	27.4%
1 mile - 0.1- 19.9 acres	55	28.8%	28	30.1%	26	27.4%
1 mile - 20-49.9 acres	52	27.2%	27	29.0%	23	24.2%
1 mile - 50 or more acres	43	22.5%	23	24.7%	20	21.1%

Note: numbers in cells do not always sum to total due to missing demographic data for some youth.

<sup>a</sup>41 youth in the sample did not have a park within 1 mile.

With respect to the total number of parks, ¼ mile, ½ mile, and 1 mile perimeters were explored. However, the data for the cut point of ¼ mile were redundant with the closest park within ¼ mile data presented above and therefore are not reported in the second section of Table 3. Over half the total sample (60.2%) had no parks within ½ mile, 29.8% had one park within ½ mile, and 9.9% had two or more parks. At the 1 mile cut point, only 41 youth (21.5%) did not have any parks, 26.2% had 1 park, 22.0% had 2 parks, and 30.4% had three or more parks. Again, females appeared less proximal to parks with a greater percentage having no park within a ½ mile (66.3%) or 1 mile (27.4%) versus males (53.8% and 16.1%, respectively). Additionally, there were fewer females having 1, 2, or 3 or more parks within ½ mile and 1 mile boundaries.

With regards to total park space, park acreage within ¼ mile, ½ mile and 1 mile perimeters was calculated. A majority of youth (86.9%) had no park acreage within ¼ mile of their homes, 6.8% had less than 5 acres, and 6.3% had 5 or more than acres (Table 3). At the ½ mile cut point, 60.2% of youth had no park acreage, 17.8% had less than 10 acres, 12% had 10-20 acres, and 9.9% had 20 or more acres. Within a one mile radius, youth were more evenly divided, with 21.5% having 0 acres, 28.8% having between 0 and 20 acres, 27.2% having 20-50 acres, and 22.5% having 50 or more acres of park space.

Binary logistic regression analyses were used to examine the relationship between each park proximity variable (independent variable) and the likelihood of youth meeting PA recommendations (dependent variable), while controlling for gender, age group, race category, income category, BMI, and census tract crime total. These analyses are shown in Table 4. For all analyses, the top group of each set was used as the reference group.

For proximity to the closest park, there were significant differences for all youth and female youth at the ½ mile cut point (Table 4). For the total sample, youth who had a park within

½ mile were two and a half times more likely to meet PA recommendations compared to those who had no parks within ½ mile (OR = 2.59, 95% CI = 1.24, 5.41). For female youth, those who had a park within ½ mile, were more than three times more likely to meet PA recommendations than those without a park (OR = 3.27, 95% CI = 1.08, 9.94).

With respect to the total number of parks, Table 4 shows that for all youth, those who had one park within ½ mile were over twice as likely to meet PA recommendations as those with no parks within ½ mile (OR = 2.29, 95% CI = 1.03, 5.09). However, youth with 2 or more parks within ½ mile were no more likely to meet recommendations than those with only 1 park (OR = 1.02, 95% CI = 0.24-4.39).

In the one mile analyses, youth who had 3 or more parks within one mile were almost four times more likely to meet PA recommendations as compared to those having no parks (OR = 3.85, 95% CI = 1.29, 11.52). When explored by gender, males with 3 or more parks within a mile were almost 15 times more likely to achieve PA recommendations as those who had no parks (OR = 14.73, 95% CI = 1.26, 172.65). When examining the full sample of youth who had at least one park within a mile, those who had 3 or more parks were almost five times more likely to achieve PA recommendations than those having only one park (OR = 4.79, 95% CI = 1.63, 14.04). Similarly, male youth with 3 or more parks were over 17 times more likely to achieve PA recommendations compared to those with only 1 park within a mile (OR = 17.45, 95% CI = 1.46, 208.01).

Finally, the total amount of park acreage was aggregated within ¼ mile, ½ mile, and 1 mile. As shown in the latter half of Table 4, only youth having between 10 and 20 acres of park

*Table 4*  
*Association of Park Proximity with Meeting Physical Activity Recommendations*

Park Proximity Analysis	Total			Male			Female		
	n	OR	95% CI	n	OR	95% CI	n	OR	95% CI
<b>Closest Park</b>									
0 parks	155	1.00		76	1.00		79	1.00	
¼ mile or less <sup>a</sup>	155	0.86	0.29-2.54	76	1.05	0.19-5.67	79	0.75	0.15-3.77
½ mile or less <sup>a</sup>	155	2.59*	1.24-5.41	76	2.22	0.68-7.23	79	3.27*	1.08-9.94
1 mile or less <sup>a</sup>	155	1.72	0.71-4.16	76	2.71	0.56-13.09	79	1.36	0.44-4.16
<b>Number of Parks</b>									
½ mile - 0 parks	155	1.00		76	1.00		79	1.00	
½ mile - 1 park	155	2.29*	1.03-5.09	76	2.19	0.60-8.04	79	2.89	0.92-9.14
½ mile - 2 or more parks	155	2.28	0.65-8.03	76	2.31	0.35-15.15	79	1.95	0.23-16.78
½ mile - 1 park	57			31	1.00		27	1.00	
½ mile - 2 or more parks	57	1.02	0.24-4.39	31	1.47	0.18-11.95	27	0.61	0.06-6.70
1 mile - 0 parks	155	1.00		76	1.00		79	1.00	
1 mile - 1 park	155	0.97	0.35-2.71	76	0.98	0.16-6.19	79	0.95	0.24-3.79
1 mile - 2 parks	155	1.76	0.59-5.22	76	4.98	0.66-37.66	79	1.04	0.25-4.30
1 mile - 3 or more parks	155	3.85*	1.29-11.52	76	14.73*	1.26-172.65	79	2.89	0.68-12.21
1 mile - 1 park	124	1.00		65	1.00		59	1.00	
1 mile - 2 parks	124	2.07	0.72-5.98	65	5.36	0.81-35.45	59	1.19	0.26-5.52
1 mile - 3 or more parks	124	4.79*	1.63-14.04	65	17.45*	1.46-208.01	59	3.62	0.78-16.94

\* p<.05

<sup>a</sup>The reference group for each closest park analysis is 0 parks within the specified distance.

*Table 4 (continued)*  
*Association of Park Proximity with Meeting Physical Activity Recommendations*

Park Proximity Analysis	Total			Male			Female		
	n	OR	95% CI	n	OR	95% CI	n	OR	95% CI
<b>Park Space</b>									
¼ mile - 0 acres	155	1.00		76	1.00		79	1.00	
¼ mile - 0.1-4.9 acres	155	0.66	0.14-3.08	76	0.53	0.03-8.12	79	1.47	0.16-13.65
¼ mile - 5 or more acres	155	0.96	0.22-4.19	76	1.76	0.16-19.50	79	0.37	0.03-4.26
¼ mile - 0.1-4.9 acres	23	1.00		13	1.00		10	1.00	
¼ mile - 5 or more acres	23	1.66	0.29-9.69	13	16.00	0.72-354.80	10	0.46	0.02-8.99
½ mile - 0 acres	155	1.00		76	1.00		79	1.00	
½ mile - 0.1-9.9 acres	155	1.78	0.66-4.85	76	1.21	0.24-6.08	79	2.74	0.59-12.67
½ mile - 10-19.9 acres	155	3.52*	1.09-11.36	76	4.11	0.68-24.97	79	5.69	0.63-51.42
½ mile - 20 or more acres	155	3.33	0.90-12.35	76	2.55	0.24-27.45	79	2.96	0.55-16.10
½ mile - 0.1-9.9 acres	57	1.00		31	1.00		26	1.00	
½ mile - 10-19.99 acres	57	2.07	0.40-10.61	31	1.35	0.14-13.05	26	1.94	0.05-70.53
½ mile - 20 or more acres	57	1.70	0.31-9.49	31	2.65	0.11-61.82	26	0.58	0.04-8.93
1 mile - 0 acres	155	1.00		76	1.00		79	1.00	
1 mile - 0.1-19.9 acres	155	1.10	0.41-2.99	76	1.51	0.27-8.48	79	1.03	0.28-3.82
1 mile - 20-49.9 acres	155	2.24	0.79-6.37	76	4.24	0.67-26.6	79	1.69	0.43-6.61
1 mile - 50 or more acres	155	2.68	0.88-8.17	76	5.69	0.66-48.85	79	1.60	0.37-6.95
1 mile - 0.1-9.9 acres	124	1.00		65	1.00		59	1.00	
1 mile - 20-49.9 acres	124	2.26	0.88-5.82	65	2.58	0.60-11.05	59	2.08	0.50-8.64
1 mile - 50 or more acres	124	2.94*	1.04-8.29	65	3.65	0.56-23.68	59	1.74	0.40-7.53

\* p<.05.



space within a ½ mile were significantly more likely to achieve PA recommendations than those having no acreage (OR = 3.52, 95% CI = 1.09, 11.36). However, when examining only those youth with at least some park space within one mile, youth with more than 50 acres were almost 3 times more likely to achieve PA recommendations than those having less than 10 acres (OR = 2.94, 95% CI = 1.04, 8.29).

### Park Features

Trained auditors completed the CPAT for a total of 146 parks in Kansas City, Missouri, capturing in-depth park characteristic information. The second research question examined the association between park features and youth PA. As described in chapter three, features were divided into 14 facilities and 25 amenities. Due to the fact that some features were observed infrequently in parks and were uncommon within ½ mile or 1 mile (let alone ¼ mile), even amongst the full sample of youth, the impact of having a feature was only explored for ½ mile and 1 mile cut points. Further, due to reduced sample sizes, the descriptive data and the binary logistic regression analyses that follow are not disaggregated by gender.

Table 5 depicts the availability of all park facilities for youth in the sample. With respect to facilities, the total sample had the greatest percentages of youth within a ½ mile of green spaces (39.3%), playgrounds (32.6%), and baseball fields (25.8%), while no youth had volleyball courts, fitness stations, skate parks, or dog parks within a park within ½ mile from home. At the 1 mile boundary, a majority of youth had at least one green space (79.8%) or a playground (71.9%), over half had a trail (58.4%), while few had a skate park (7.9%), volleyball court (5.6%), fitness stations (5.6%), or a dog park (3.4%).

With regard to amenities within a ½ mile, Table 6 shows youth frequently had parks that offered car parking (42.7%), traffic signals (36.0%), and sidewalks (34.8%), while very few

youth had parks that contained threatening behavior (3.4%), bike lanes (2.2%), bike racks (2.2%), or vending machines (1.1%). No youth had a park within a ½ mile containing an emergency device. At the 1 mile boundary, a majority of youth had parks with car parking (77.5%), trash cans (75.3%), and traffic signals (73.0%), while amenities such as bike racks (5.6%), vending machines (2.2%), and emergency devices (2.2%) remained sparse.

*Table 5*  
*Availability of Park Facilities within*  
*½ Mile and 1 Mile of Sample Youth*

Park Facilities Variable	Total			
	½ Mile		1 Mile	
	n	%	n	%
Green Space	35	39.3%	71	79.8%
Playground	29	32.6%	64	71.9%
Baseball Field	23	25.8%	50	56.2%
Trail	18	20.2%	52	58.4%
Basketball Court	16	18.0%	38	42.7%
Tennis Court	9	10.1%	32	36.0%
Sports Field	6	6.7%	22	25.8%
Swimming Pool	4	4.5%	9	10.1%
Lake	3	3.4%	18	20.2%
Splash Pad	2	2.2%	10	11.2%
Skate Park	0	0.0%	7	7.9%
Volleyball Court	0	0.0%	5	5.6%
Fitness Station	0	0.0%	5	5.6%
Dog Park	0	0.0%	3	3.4%

Note: Percentages represent those who had a feature within ½ mile or 1 mile.

*Table 6*  
*Availability of Park Amenities within*  
*½ Mile and 1 Mile of Sample Youth*

Park Amenities Variable	Total			
	½ Mile		1 Mile	
	n	%	n	%
Car Parking	38	42.7%	69	77.5%
Traffic Signal	32	36.0%	65	73.0%
Sidewalk	31	34.8%	62	69.7%
Trash Cans	30	33.7%	67	75.3%
Benches	29	32.6%	65	73.0%
Picnic Table	29	32.6%	63	70.8%
Neighborhood Visible	23	25.8%	61	68.5%
Lights	22	24.7%	48	53.9%
Grill	20	22.5%	55	61.8%
Transit Stop	20	22.5%	42	47.2%
Shade	17	19.1%	52	58.4%
Drinking Fountain	17	19.1%	43	48.3%
Picnic Shelter	11	12.4%	36	40.4%
Roads Through Park	9	10.1%	33	37.1%
Restroom	8	9.0%	35	39.3%
External Trail	7	7.9%	25	28.1%
Park Monitored	7	7.9%	19	21.3%
Dangerous Spots	6	6.7%	36	40.4%
Rule Posted-Animals	6	6.7%	28	31.5%
Animal Waste Bags	6	6.7%	24	27.0%
Threatening Behavior	3	3.4%	10	11.2%
Bike Lane	2	2.2%	6	6.7%
Bike Rack	2	2.2%	5	5.6%
Vending	1	1.1%	2	2.2%
Emergency Device	0	0.0%	2	2.2%

Note: Percentages represent those who had a feature within ½ mile or 1 mile.

Table 7 shows the association of youth having park facilities within a ½ mile and 1 mile and the odds of meeting PA recommendations, while controlling for gender, age group, race category, BMI category and tract crime total. For all facilities and amenities analyses, the

reference group was youth who did not have a park with the facility or amenity within ½ mile or 1 mile.

The majority of facilities examined displayed a positive relationship with youth meeting PA recommendations at both the ½ mile and 1 mile boundary, with several reaching statistical significance (Table 7). For the entire youth sample, those who had a park offering a playground within ½ mile were two and a half times more likely to meet PA recommendations than those without a playground (OR = 2.51, 95% CI = 1.11, 5.65), while youth who had a park with a

*Table 7*  
*Association of Park Facilities with Meeting Physical Activity Recommendations*

Park Facilities	½ Mile		1 Mile	
	OR	95% CI	OR	95% CI
Playground	2.51*	1.11-5.65	2.07	0.94-4.57
Sports Field	2.89	0.27-31.27	1.25	0.51-3.06
Baseball Field	2.52	0.96-6.60	2.88*	1.33-6.26
Swimming Pool	1.79	0.28-11.30	1.58	0.49-5.13
Splash Pad	n/a	n/a	1.44	0.43-4.81
Basketball Court	1.20	0.45-3.17	1.88	0.88-4.03
Tennis Court	0.68	0.21-2.16	1.33	0.63-2.81
Volleyball Court	n/a	n/a	2.49	0.42-14.97
Trail	1.27	0.54-3.00	2.05	0.99-4.23
Fitness Station	n/a	n/a	4.14	0.42-40.56
Skate Park	n/a	n/a	3.05	0.52-17.90
Dog Park	n/a	n/a	4.08	0.31-54.41
Green Space	1.26	0.60-2.64	1.72	0.71-4.16
Lake	0.59	0.09-3.78	1.14	0.46-2.85

\* p < .05.

For all analyses, the reference group was youth who did not have the park feature within ½ mile or 1 mile.

n/a indicates no features at the specified distance.

baseball field within 1 mile were almost 3 times as likely to meet PA recommendations (OR = 2.88, 95% CI = 1.33, 6.26). As well, it should be noted that although the association did not quite

reach statistical significance (OR = 2.05, 95% CI = 0.99, 4.23), youth having a park containing a trail within 1 mile displayed an increased likelihood of meeting PA recommendations.

With respect to amenities, Table 8 shows the association of youth having the 25 amenities within ½ mile and 1 mile and the odds of meeting PA recommendations.

*Table 8*  
*Association of Park Amenities with Meeting Physical Activity Recommendations*

Park Amenities	½ Mile		1 Mile	
	OR	95% CI	OR	95% CI
Transit Stop	1.38	0.56-3.37	2.17*	1.02-4.63
Car Parking	1.39	0.67-2.87	1.51	0.65-3.52
Bike Rack	n/a	n/a	0.46	0.10-2.05
Sidewalk	1.42	0.66-3.04	1.92	0.90-4.10
External Trail	0.51	0.13-1.96	0.9	0.42-1.93
Bike Lane	n/a	n/a	0.51	0.13-1.96
Traffic Signal	2.11	0.95-4.67	2.65*	1.19-5.92
Restroom	0.84	0.22-3.22	1.28	0.59-2.77
Drinking Fountain	1.01	0.40-2.56	1.15	0.55-2.39
Benches	1.48	0.69-3.17	1.85	0.82-4.17
Picnic Table	1.91	0.84-4.32	2.47*	1.14-5.34
Picnic Shelter	1.44	0.50-4.14	1.73	0.82-3.68
Grill	1.65	0.64-4.23	2.77*	1.31-5.85
Trash Cans	1.68	0.78-3.63	2.40*	1.07-5.38
Vending	n/a	n/a	0.72	0.05-9.85
Shade	0.73	0.28-1.92	2.37*	1.15-4.87
Rule Posted-Animals	1.17	0.27-5.11	0.96	0.43-2.14
Animal Waste Bag	1.44	0.32-6.43	1.17	0.50-2.74
Lights	1.87	0.77-4.56	1.47	0.70-3.09
Park Monitored	0.76	0.17-3.45	0.82	0.34-1.97
Emergency Device	n/a	n/a	0.95	0.12-7.70
Threatening Behavior	n/a	n/a	1.46	0.42-5.09
Neighborhood Visible	0.98	0.41-2.38	1.63	0.78-3.43
Roads Through Park	2.01	0.55-7.41	3.09*	1.32-7.25
Dangerous Spots	0.34	0.09-1.34	1.22	0.59-2.54

\* p < .05;

For all analyses, the reference group was youth who did not have the park feature within ½ mile or 1 mile.

n/a indicates no features at the specified distance.

The results of binary logistic regression analyses indicated no statistical significance for any amenity at the ½ mile boundary. At the 1 mile boundary, however, several amenities exhibited statically significant positive associations with youth meeting PA recommendations. Youth were more than twice as likely to achieve PA recommendations if they were within 1 mile of a park that had transit stops (OR = 2.17, 95% CI = 1.02, 4.63), traffic signals (OR = 2.65, 95% CI = 1.19, 5.92), picnic tables (OR = 2.47, 95% CI = 1.14, 5.34), grills (OR = 2.77, 95% CI = 1.31, 5.85), trash cans (OR = 2.40, 95% CI = 1.07, 5.38), or shade (OR = 2.37, 95% CI = 1.15, 4.87). Youth were more than three times as likely to achieve PA recommendations if they were within 1 mile of a park that had roads through it (OR = 3.09, 95% CI = 1.32, 7.25).

## Chapter 5

### DISCUSSION

With the dramatic increase in childhood obesity rates over the last three decades, it is important to explore population level solutions to youth physical inactivity. Given their availability throughout communities, parks are an accessible and affordable resource for facilitating youth PA. A variety of park variables, including proximity, access, size, features, and condition can influence PA in parks. Therefore, it is necessary to evaluate park determinants of youth PA. The primary purpose of this study was to examine the association of park proximity and park features with the PA levels of nearby youth. Detailed park audits, GIS data, and household surveys were utilized to explore two overall research questions:

1. Is park proximity associated with nearby youth achieving recommended levels of physical activity?
2. Which park features are associated with nearby youth achieving recommended levels of physical activity?

#### Park Proximity and Youth Physical Activity

In this study, the relationship between park proximity and youth meeting PA recommendations was examined in three ways: distance to closest park, number of parks within ¼ mile, ½ mile and 1 mile, and total park acreage within ¼ mile, ½ mile and 1 mile. Findings for all three proximity variables agree with the majority of the literature that increased proximity to a park is positively related to youth PA. Indeed, a review of the literature by Kaczynski and Henderson (2007) found that in most, if not all of the studies, proximity to a park was generally a

positive correlate of PA. Additionally, a more recent review by Lachowycz and Jones (2011) showed that six out of 14 studies among children and teenagers reported positive associations of green space and PA.

With respect to distance to the closest park, all youth and females with their closest park within ½ mile or less were two to three times more likely to achieve PA recommendations than those without a park within 1 mile. This is similar to previous research that found increased park use, especially by children, if the park was within walking distance (McCormack, Rock, Toohey, & Hignell, 2010). Frank and colleagues (2007) also found that adolescents having at least one recreation or open space within 1 km of home was the neighborhood attribute most related to both frequency (at least once over two days) and duration (greater than .5 miles) of walking among youth. This may be due to increased objective or perceived park accessibility by the parent or the child. Parks that are more proximal may be actively commuted to more often. Additionally, parental perceptions of safety may be greater if a park is closer (i.e., shorter walking distances to the park may help parents feel “safer” letting their children actively commute or play there). For example, Veitch et al. (2010) found that parents had concerns in letting their child access a park if it was too far from home or if they have to cross a busy intersection to get there.

The second proximity variable explored the total number of parks within ½ mile and 1 mile of all sample youth. The results indicated that compared to having no parks, youth that had 1 park within a ½ mile or 3 or more parks within 1 mile were more likely to meet PA recommendations. When explored by gender, male youth who had a 3 or more parks within 1 mile as opposed to no parks were significantly more likely to achieve recommendations. When



comparing having 3 or more parks within 1 mile to only having 1 park, both total youth and male youth were significantly more likely to achieve PA recommendations.

Several studies agree with these findings that having a greater number of parks nearby can increase PA behavior. A study by Scott and colleagues (2007) examining the relationship of both perceived and objectively measured number and proximity of parks found that objectively measured PA sites within 1 mile of participants' homes was associated with increased PA among youth. This could be due to the increased likelihood of having specific features available (i.e., having several parks nearby may increase the chance of a child having a playground close to their home). Additionally, children may take a variety of routes throughout their neighborhood to access points of interest (e.g., school, friend's house, babysitter) and the increased odds of meeting PA recommendations may be due to greater ease of accessing a park in multiple directions (i.e., having a greater number of parks in a youth's neighborhood may lend itself to an increased likelihood of incorporating park-based PA into everyday activities). In contrast to our findings that males with a greater number of parks were more likely to achieve PA recommendations, Norman and colleagues (2006), when examining both parks *and* recreation facilities, found that the total number of resources was positively associated with PA in girls. However, these disparate findings could be due to gender-related differences in parental perceptions of safety, in that when taking into account only parks, parents may feel safer letting male youth play outside. For example, Gomez et al (2004) found that violent crimes presented a significant barrier to *outdoor* play specifically for Mexican American girls.

With respect to total park acreage within ½ mile and 1 mile, this study found that youth were more likely to achieve PA recommendations if they lived within ½ mile of 10-19.9 acres of park space compared to 0 park acres. Roemmich et al. (2006) concur that proximity to parks has

strong associations with PA, as they found that a greater proportion of park area within ½ mile was associated with increased levels of youth PA. Likewise, Loukaitou-Sideris and Sideris (2010) also noted that park area was found to be positively associated with park usage for all youth. When examining youth with at least some park space within 1 mile, this study found that youth with more than 50 acres within 1 mile were almost 3 times more likely to achieve PA recommendations. These results may reflect subconscious park choices by youth related to spatial characteristics (i.e., larger parks may attract more children because they are more visually appealing). A study by Boone-Heinonen et al. (2010) found that greater green space coverage was positively associated with youth reporting bouts of PA participation. Additionally, larger parks may offer a greater variety of facilities and amenities that appeal to youth populations.

#### Park Features and Youth Physical Activity

The relationship between park features and youth meeting PA recommendations was observed by evaluating the availability of 14 park facilities and 25 amenities within ½ mile and 1 mile boundaries. This study found that youth having a park with a playground within ½ mile of their home were two and a half times more likely to achieve PA recommendations. Youth with a baseball field within 1 mile of their home were almost three times more likely to achieve PA recommendations. Additionally, youth having a park containing a trail within 1 mile displayed an increased likelihood of meeting PA recommendations. Again, these results are reflective of the literature concerning park features. A qualitative examination of parents found playgrounds and equipment were important to youth PA (Veitch et al., 2006), while Potwarka and colleagues (2008) found that park playgrounds within 1 km of the children's home were a significant predictor of being a healthy weight. Cohen and colleagues (2006) found that girls who live within ½ mile of

parks with playgrounds had higher amounts of PA, while research by Floyd and colleagues (2008) shows that parks with playgrounds in diverse neighborhoods can be the site of high levels of PA.

This study's findings regarding baseball fields contrast with previous research. For example, a study by Cohen et al. (2007) found that baseball fields had lower percentages of time used than other park target areas. Likewise, Floyd and colleagues (2008) reported that ball diamonds had lower energy expenditure than activity areas such as playgrounds or basketball courts. Moreover, several studies found that park areas used for competitive team sports, such as baseball fields, were primarily used by males which could further reduce the total number of users (Cohen et al., 2007; Loukaitou-Sideris and Sideris, 2010). Though not directly tested in our study, the present results may be indicative of community sports leagues promoting use of baseball fields within parks, thereby increasing the odds that local youth meet PA recommendations. Additionally, the presence of a baseball field within a park may attract patrons for alternative forms of park-based PA.

With respect to trails, several studies of adults agree that parks with walking paths and trails are visited more often (Reed et al., 2008) and are more likely to lead to the park being used for PA (Kaczynski, Potwarka, & Saelens, 2008). This study is first to the author's knowledge that suggests that parks with trails may be important for *youth* PA as well. However, these results could simply reflect parental preferences for multi-use parks, as actual usage of park trails by youth was not recorded. In contrast to this study's findings, Veitch et al. (2011) found that children that had a walking path in the closest public open space actually spent more time using a computer, possibly reducing time spent being physically active.

The significance of specific park facilities could be because parks containing a variety of facilities and amenities support a myriad of users (Kaczynski et al., 2008; Giles-Corti et al.,

2005). McCormack et al. (2010) suggested that parks containing a variety of features supporting both structured and unstructured PA were important for encouraging park use. Additionally, park facility and amenity preferences may vary by age. Parents may look for parks with features that suit both children and adults, while differences may exist in youth of varying ages. Veitch et al. (2010) indicated that older children found parks “boring” due to a lack of engaging equipment making certain parks unappealing for parents with children of various ages. Furthermore, a wider variety of features may satisfy differences in gender or cultural-based preferences. Loukaitou-Sideris and Sideris (2010) found that playgrounds, including slides and swings, were most often utilized by girls, while boys most frequently reported using playing fields, including soccer fields, basketball courts, and baseball or softball diamonds. Timperio and colleagues (2008) also reported that certain features were important to PA among children, but that those varied by gender. They found that playgrounds were positively associated with PA for boys, while shade was positively associated with PA for girls. Finally, a study by Perry, Saelens, and Thompson (2010) showed that in addition to being male, being Latino was associated with higher use of court and field parks. This study supports the concept that parks containing a variety of facilities may contribute to increased PA in youth.

With respect to amenities, no significant relationships were observed at the ½ mile boundary. However, parks within 1 mile of the youths’ home that had transit stops, traffic signals, picnic tables, grills, trash cans, shade, and roads through the park were all associated with greater odds of youth achieving PA recommendations. The literature agrees that certain supporting amenities can affect PA levels. A review by McCormack and colleagues (2010) showed that both adults and children report amenities such as restrooms, water fountains, barbeques, picnic areas, seating, signage, and shade as all important within parks. Additionally,

Cohen et al. (2006) found that park amenities such as streetlights, floodlights, shaded areas, and drinking fountains were related to increased PA in adolescent girls, while Tucker and colleagues (2007) found that parents' main reasons for choosing a park included water attractions, shade, swings, and cleanliness.

Some studies suggest that parks that provide greater numbers of amenities may allow patrons to utilize parks for longer periods of time which may increase PA levels (Ries et al., 2008; McCormack et al., 2010). Significant supporting amenities in our study may be due to enhanced accessibility and safety (e.g., transit stops, traffic signals, roads through the park) as well as comfort variables (e.g., shade, picnic tables, grills, trash cans) that support park usage. Amenities that support passive types of activities such as shade or picnic tables for sitting may offer parents a relaxing option while letting their children play. Furthermore, parks that support both active and passive activities may lure a greater variety of patrons (even those not seeking PA) into incidentally being active by means of active transport to the park or to reach desired park features (i.e. walking to the park for a family cookout). For example, Tilt and colleagues (2010) found that adults with children in the household most frequently walked to parks compared to other destinations. In summary, a variety of park features are important to youth PA. Moreover, individual characteristics such as gender, age, and race may also influence preferences for different facilities or amenities within parks.

### Study Limitations and Strengths

Limitations to this study included a lower than expected response rate of 27.4%. However, this rate is comparable to the 21% reported by Tilt (2010) in another recent mail survey study about parks and neighborhood-based PA. A low response rate can lead to sampling bias if unequal nonresponse exists among the participants regarding exposure and/or outcome

variables. However, comparing successive survey waves is a common type of non-response extrapolation method where persons who responded to later waves are expected to be similar to nonrespondents due to increased stimulus (Armstrong & Overton, 1977). Chi-square analyses of all four waves of surveys in this study showed no significant differences between respondents to different waves for several youth variables, including gender, age, race, or meeting PA recommendations.

Additionally, the youth sample characteristics with respect to geographic distribution, age, ethnicity, and race appeared representative of the greater Kansas City, Missouri population, while body mass index and percentages of youth meeting PA recommendations were similar to nationwide data (CDC, 2011). Some studies suggest that lower response rates may yield similar if not more accurate measurements, and that lower response rates do not necessarily equal lower accuracy (Visser, Krosnick, Marquette and Curtin, 1996; Holbrook et al., 2005).

The smaller response rate paired with missing survey data for some covariates led to a smaller youth sample size for analysis than anticipated (n=155). This problem was exacerbated when exploring associations within the two separate gender groups. Further, the dispersion of youth across the city meant that multilevel modeling to determine prospective neighborhood level effects was not possible. However, significant results with smaller samples can be viewed as a stronger relationship, while the greater geographic distribution of youth in this study may enhance external validity.

Another possible limitation of this study is the inability to assume causality within results due to its cross-sectional design (i.e., inability to establish a temporal relationship between park characteristics and youth PA). However, Kaczynski and Mowen (2011) found that adults placing a greater importance on neighborhood open space were not any more likely to live near a park.

Further, even those persons who placed little importance on open space were more likely to engage in park-based PA when living near parks. These findings suggest that the relationship observed between parks and PA is not solely accounted for by self-selection, possibly increasing the ability to draw more definitive conclusions about causality. Nevertheless, longitudinal research examining the role of parks in promoting youth PA may provide invaluable insight and prove to be a worthwhile research endeavor. Finally, this study may be limited by a lack of direct measurement of youth PA. However, due to the range of ages explored in this study, use of a validated parental proxy survey measure (Prochaska et al., 2001) to assess youth PA was deemed appropriate.

A strength of this study was the inclusion of all parks within sample youths' neighborhoods, a limitation and future research suggestion noted in Veitch et al.'s (2011) study. Other studies have looked at individual proximity variables, such as a youth's closest park. However, with the inclusion of all parks within one mile, this study examined three different proximity variables: closest park, total number of parks, and total park acreage. Additionally, this study involved a large number of detailed park audits (n= 146), including in-depth information on the availability of 14 facilities and 25 amenities. Moreover, although not included in the present analyses, information regarding the usability and condition of all park facilities and amenities as well as overall park quality was collected. Finally, this study controlled for multiple individual and neighborhood level characteristics that are known to be related to PA such as gender, age, race, income, body mass index, and neighborhood crime.

#### Practical Implications and Suggestions for Future Research

This study highlights the need to inform policy makers about the importance of parks in providing opportunities for PA among youth. Parks and recreation agencies should consider ways

to provide youth with improved accessibility to parks, such as through increased size and number of neighborhood-based parks as well as enhancing accessibility variables such as transit stops or traffic signals on adjacent roads. Furthermore, our results indicate the importance of playgrounds, baseball fields, and trails as activity areas conducive to youth park-based PA. Implications for health promotion practice or research should consider how playgrounds, baseball fields, and trails located in parks might be designed, maintained, and promoted to encourage greater opportunities for youth PA. Supporting amenities such as shade, picnic tables, trash cans, and grills should also be taken into consideration when designing safe and attractive multi-use parks for all ages. Further, as this study only explored park-based facilities, future research should comprehensively examine youth's access to PA promoting features and amenities (i.e., school playgrounds) within their neighborhood.

Due to the findings that park features can be important to youth park-based PA, it is important to investigate beyond mere availability of features. A study by Colabianchi et al. (2009) reported that the quality of play spaces, specifically playgrounds, influences their use. Future research should account for overall park quality as well as the quality of individual park facilities and amenities. Moreover, similar to a recent study of specific playground attributes by Colabianchi et al. (2011), it may also be beneficial to examine the detailed design elements of certain key park features (e.g., slides vs. swings, colors, shade, etc.). Additionally, research suggests that differences exist in youth PA by age and race. Due to small sample sizes, we were unable to examine relationships according to age or race in the current study. Reduced sample sizes also prevented us from examining park features and amenities by gender. Future studies should evaluate park determinants of youth PA within various gender, age, and racial groups.



Due to dispersion of youth across the city, we were unable to utilize multilevel modeling to determine potential neighborhood level effects in this study. Future research should examine a larger number of youth within defined neighborhoods to determine possible neighborhood contributions (e.g., street connectivity, land use diversity, residential density, etc) that may impact youth PA levels.

Finally, youth demographic and socioeconomic disparities in availability and access to parks and recreation areas have been recognized as an important research endeavor (Taylor, Floyd, Whitt-Glover, & Brooks, 2007). Future research should further examine youth disparities in park availability, features, and quality within racially and socioeconomically diverse neighborhoods, and how these may influence PA of the youth therein.

### Conclusion

This study examined the association of park proximity and park features with the PA levels of nearby youth. The present findings support previous research indicating that parks are valuable community resources that can play an important role in the battle against rising rates of obesity and chronic disease in youth across the country (Bedimo-Rung et al., 2005; Sallis & Glanz, 2006; Kaczynski & Henderson, 2007; Potwarka, Kaczynski, & Flack, 2008; Mowen, Kaczynski, & Cohen, 2008). The results showed that both proximity and specific park facilities and amenities were positively associated with an increased likelihood of nearby youth achieving PA recommendations.

This study contributes to the literature in several ways. First, it examined proximity with three variables – closest park, total number of parks, and total park acreage. This method allowed inclusion of all parks within a 1 mile buffer to be included in analyses as opposed to only looking at a youth's closest park. Second, this study captured data for a wide variety of park facilities and

amenities. Finally, this study is one of only a few studies to date to specifically examine the association of attributes such as park proximity and features as they relate to youth PA.

Better understanding the ways in which park and neighborhood characteristics are associated with PA among children can inform future research and environmental and policy changes aimed at improving the use of open spaces and reducing obesity amongst youth. Investing in accessible, well-designed, and maintained parks can contribute to population-level youth PA promotion and can help to ensure the well-being of generations to come.

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## APPENDIX A

### Community Park Audit Tool (CPAT)



# COMMUNITY PARK AUDIT TOOL

## **Instructions**

Before you begin, review the brief training guide and audit tool and try to locate a map of the park. This is important to ensure each question and response option is clear when you are making your ratings. Then, go to the park and proceed with filling out this audit tool. The tool (6 pages) is divided into four sections that focus on different aspects of the park environment. Additional instructions are provided within each section.

## **Tips for Using the Community Park Audit Tool (CPAT)**

- Drive, bike, or walk around the park to get a feel for the contents and characteristics of the park and surrounding neighborhood.
- The CPAT is organized such that questions on similar topics are grouped into logical sections and the four sections are arranged in the order that you might encounter them during your audit. However, you may need to switch between sections or pages as you complete the park audit. Therefore, it is important to review and be familiar with all of the tool sections and questions before you begin your audit.
- It is also important that you check back through the full document (6 pages) when you are finished to ensure you have completed all the sections and questions.
- Space is provided at the end of each section (and some individual questions) where you can take notes or record comments as you complete your audit. The margins or back of each page (if copied single-sided) can also be used to take notes, but please be sure that all relevant information is transferred to appropriate places on the tool and that all questions are fully answered using the format provided.
- If you see anything during your audit that requires immediate attention, contact the local parks department.

## Section 1: Park Information

**Park Name:** \_\_\_\_\_ **Observer Name or ID:** \_\_\_\_\_

**Park Address/Location:** \_\_\_\_\_

**Were you able to locate a map for this park?**  No  Yes

**Was the park easy to find onsite?**  No  Somewhat  Yes

**Date (m/d/yr):** \_\_\_ / \_\_\_ / \_\_\_\_\_

**Approximate Temperature:** \_\_\_ °F **Weather:**  Clear  Partly Cloudy  Rain/Snow

**Start Time:** \_\_\_\_\_ am or pm (circle) **End Time:** \_\_\_\_\_ am or pm (circle) **Length of visit:** \_\_\_\_\_ min

Comments on Park Information:

## Section 2: Access and Surrounding Neighborhood

This section asks about factors related to accessing the park and about features of the neighborhood surrounding the park. Several questions include follow-up responses if you answered yes. After completing all questions, provide any additional comments in the space at the end of the section. **When thinking about the surrounding neighborhood, consider all areas that are visible from all sides of the park.**

When rating the access and surrounding neighborhood, please use the following definition:

- **Useable:** everything necessary for use is present and nothing prevents use (e.g., sidewalks are passable)

1. Can the park be **accessed for use?** (e.g., not locked/fenced, available for activity, etc.)  No  Yes
2. Are there **signs** that state the following (could be same sign)? *(check all that are present)*
  - Park name  Park hours  Park contact information  Park/facility rental information
  - Park rules  Park map  Rental equipment information  Event/program information
3. How many **points of entry** does the park have?  More than 5 (or park boundary is open)  2-5  Only 1
4. Is there a **public transit stop** within sight of the park?  No  Yes
5. What types of **parking** are available for the park? *(check all that are present)*
  - None  Parking Lot  On street parking  Bike rack(s)
6. Are there **sidewalks** on *any* roads adjacent to the park? (could be on opposite side of road)  No  Yes  
 If yes ... Are they useable?  All or most are useable  About half  None or few useable  
 If yes ... Are there **curb cuts and/or ramps** on *any* sidewalks bordering or entering the park?  No  Yes
7. Is there an external **trail or path** connected to the park?  No  Yes  
 If yes ... Is it useable?  No  Yes
8. Are there **bike routes** on *any* roads adjacent to the park? *(check all that are present)*
  - None  Marked lane  Designated route sign  Share the road signs/markers
9. Are there nearby **traffic signals** on *any* roads adjacent to the park? (e.g., crosswalk, stop light/sign)  No  Yes
10. What are the main **land use(s) around the park?** *(check all that apply)*
  - Residential  Commercial  Institutional (e.g., school)  Industrial (e.g., warehouse)  Natural
11. Which of the following **safety or appearance concerns** are present in the **neighborhood surrounding the park?** *(check all that are present in the surrounding neighborhood within sight on any side of the park)*
  - Inadequate lighting (e.g., absent or limited lighting on surrounding neighborhood streets)
  - Graffiti (e.g., markings or paintings that reduce the visual quality of the area)
  - Vandalism (e.g., damaged signs, vehicles, etc.)
  - Excessive litter (e.g., noticeable amounts of trash, broken glass, etc.)
  - Heavy traffic (e.g., steady flow of vehicles)
  - Excessive noise (e.g., noticeable sounds that are unpleasant or annoying)
  - Vacant or unfavorable buildings (e.g., abandoned houses, liquor store)
  - Poorly maintained properties (e.g., overgrown grass, broken windows)
  - Lack of eyes on the street (e.g., absence of people, no houses or store fronts)
  - Evidence of threatening persons or behaviors (e.g., gangs, alcohol/drug use)
  - Other \_\_\_\_\_

Comments on Access or Surrounding Neighborhood Issues:

### Section 3: Park Activity Areas

This section asks about the activity areas in the park. For each activity area type:

1. **First, indicate the number (#) that are present in the park** (if none, write "0").
2. Then, respond to several subsequent questions about **up to three** of those particular areas. If there are more than three areas for a specific activity area type, **rate the first three you encounter during the audit**. If there were no activity areas of that type present in the park, move on to the next type.
3. Finally, use the space provided to note any additional comments about each type of activity area.

When rating the activity areas, please use the following definitions:

- **Useable:** everything necessary for use is present (excluding portable equipment - rackets, balls, etc.) and nothing prevents use (e.g., are there nets up for tennis courts, goals for sport fields, are trails passable, etc.)
- **Good condition:** looks clean and maintained (e.g., minimal rust, graffiti, broken parts; even surface; etc.)

12. Activity Areas	# of Areas	Area 1	Area 2	Area 3
<b>a. Playground</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Distinct areas for different age groups		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Colorful equipment (i.e., 3+ colors)		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Shade cover for some (25%+) of the area		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Benches in/surrounding area		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Fence around area (i.e., half or more)		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Separation or distance from road		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				
<b>b. Sport Field (football/soccer)</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				
<b>c. Baseball Field</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				
<b>d. Swimming Pool</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				
<b>e. Splash Pad</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				
<b>f. Basketball Court</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				
<b>g. Tennis Court</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				

Activity Areas	# of Areas	Area 1	Area 2	Area 3
<b>h. Volleyball Court</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				
<b>i. Trail</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Connected to activity areas		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Distance markers/sign		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Benches along trail		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
What is the trail surface? <i>(check one)</i>		<input type="checkbox"/> Paved	<input type="checkbox"/> Paved	<input type="checkbox"/> Paved
		<input type="checkbox"/> Crushed stone	<input type="checkbox"/> Crushed stone	<input type="checkbox"/> Crushed stone
		<input type="checkbox"/> Dirt/mulch	<input type="checkbox"/> Dirt/mulch	<input type="checkbox"/> Dirt/mulch
Comments:				
<b>j. Fitness Equipment/Stations</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				
<b>k. Skate Park</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				
<b>l. Off-Leash Dog Park</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				
<b>m. Open/Green Space</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				
<b>n. Lake</b>	(# : _____)			
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Is there a designated swimming area?		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				
<b>o. Other</b> <i>(fill in a type description for each)</i>				
Useable		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Good condition		<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Comments:				
Comments on Park Activity Areas:				

## Section 4: Park Quality and Safety

This section asks about factors related to comfort and safety when using the park. Several questions include follow-up responses if you answered yes. After completing all questions, provide any additional comments in the space at the end.

When rating the quality and safety features of the park, please use the following definitions:

- **Useable:** everything necessary for use is present and nothing prevents use (e.g., can get into restrooms, drinking fountains work, etc.)
- **Good condition:** looks clean and maintained (e.g., minimal rust, graffiti, broken parts; etc.)

13. Are there public **restroom(s)** or **portable toilet(s)** at the park?  No  Yes

If yes ...

- Are the restroom(s) useable?  All or most are useable  About half  None or few are useable  
 Are they in good condition?  All or most in good condition  About half  None or few in good condition  
 Is there a family restroom?  No  Yes  
 Is there a baby change station in any restroom?  No  Yes

14. Are there **drinking fountain(s)** at the park?  No  Yes

If yes ...

- How many different fountains are there? (i.e., units, not spouts) \_\_\_\_\_  
 Are the fountains useable?  All or most are useable  About half  None or few are useable  
 Are they in good condition?  All or most in good condition  About half  None or few in good condition  
 Are they near activity areas?  All or most are near  About half  None or few are near

15. Are there **bench(es)** to sit on in the park?  No  Yes

If yes ...

- Are the benches useable?  All or most are useable  About half  None or few are useable  
 Are they in good condition?  All or most in good condition  About half  None or few in good condition

16. Are there **picnic table(s)** in the park?  No  Yes

If yes ...

- Are the tables useable?  All or most are useable  About half  None or few are useable  
 Are they in good condition?  All or most in good condition  About half  None or few in good condition  
 Is there a picnic shelter in the park?  No  Yes  
 Is there a grill or fire pit in the park?  No  Yes

17. Are there **trash cans** in the park?  No  Yes

If yes ...

- Are they overflowing with trash?  All or most overflowing  About half  None or few overflowing  
 Are they near activity areas?  All or most are near  About half  None or few are near  
 Are recycling containers provided?  No  Yes

18. Is there **food/vending machines** available in the park?  No  Yes

19. If the sun was directly overhead, how much of the park would be **shaded**?  <25%  25-75%  >75%

20. Are there **rules posted about animals** in the park? (e.g., dogs must be leashed)?  No  Yes

21. Is there a place to get **dog waste pick up bags** in the park?  No  Yes

If yes ... Are bags available at any of the locations?  No  Yes

22. Are there **lights** in the park? (not including neighborhood street lights)  No  Yes  
 If yes ...  
 How much of the park could be lit?  <25%  25-75%  >75%  
 Are the activity areas lit?  All or most are lit  About half  None or few are lit
23. Is the **park monitored**? (e.g., volunteer or paid staff, patrolled by police, cameras, etc.)  Unsure  Yes
24. Are there **any emergency devices** in the park? (e.g., phone, button, emergency directions)  No  Yes
25. Is there evidence of **threatening behavior or persons** in the park? (e.g., gangs, alcohol/drug use)  No  Yes
26. From the center of the park, how **visible is the surrounding neighborhood**?  Fully  Partially  Not at all
27. Are there **road(s)** of any type through the park?  No  Yes  
 If yes ... Are there traffic control mechanisms on the roads within the park? (e.g., crosswalk, stop light or sign, brick road, speed bumps, roundabouts)  No  Yes
28. Which of the following **park quality concerns** are present in the park? (*check all that are present*)
- Graffiti (e.g., markings or paintings that reduce the visual quality of the area)
  - Vandalism (e.g., damaged signs, buildings, equipment, etc.)
  - Excessive litter (e.g., noticeable amounts of trash, broken glass, etc.)
  - Excessive animal waste (e.g., noticeable amounts of dog waste)
  - Excessive noise (e.g., noticeable sounds that are unpleasant or annoying)
  - Poor maintenance (e.g., overgrown grass/weeds/bushes or lack of grass in green areas)
  - Other \_\_\_\_\_
29. What **aesthetic features** are present in the park? (*check all that are present*)
- Evidence of landscaping (e.g., flower beds, pruned bushes)
  - Artistic feature (e.g., statue, sculpture, gazebo, fountain)
  - Historical or educational feature (e.g., monument, nature display, educational signs, etc.)
  - Wooded area (e.g., thick woods or dense trees)
  - Trees throughout the park (e.g., scattered trees)
  - Water feature (e.g., lake, stream, pond)
  - Meadow (e.g., natural, tall grassy area)
  - Other \_\_\_\_\_
30. Are there any **dangerous spots** in the park? (e.g., abandoned building, pit/hole)  No  Yes

Comments on Park Quality and Safety Issues:

**Before finishing, please ensure you have answered all questions in the tool.**

## APPENDIX B

Kansas City Neighborhood and Park Survey Cover Letter



October 19, 2010

Dear Kansas City resident:

This letter is to introduce you to a project being conducted by researchers at Kansas State University and the University of Missouri in association with the Kansas City Parks and Recreation Department. We are interested in learning more about how neighborhood and park factors influence the opportunities Kansas City families have to be physically active. With your assistance, we can gain valuable knowledge about how to better design neighborhoods and parks in order to improve the health of our community.

Your household is one of a small number of households in Kansas City that has been randomly selected to take part in this project. To ensure that we gain a representative picture of Kansas City residents' opinions, it is important that we hear from as many selected households as possible. **Enclosed is a survey that we would like one adult in the household to complete and return at your earliest convenience.** Additionally, we are interested in learning more about factors contributing to youth physical activity. **Therefore, if applicable, please provide information for one child (3-17 years old) who is living at home.**

The survey will take approximately 20-25 minutes to complete and a pre-paid return envelope is enclosed for your convenience. To thank you for your time, **we have included a complimentary pass for any Kansas City Parks and Recreation community center.** Further, you can be entered to win **one of several \$50 gift certificates** to a restaurant or store of your choice and you may also receive a summary of the project results upon request (please see the enclosed blue insert to return in the envelope with your survey).

Information collected in this survey has the potential to inform important policy and planning decisions and we hope you will strongly consider participating in this exciting project. You may decline answering any survey questions that you do not wish to complete and all of the information you provide will be kept confidential. This study has been approved by the University Research Compliance Office at Kansas State University.

If you would like any further information about the study, please do not hesitate to get in touch with us. Thank you for your time and willingness to improve the health of your community.

Sincerely,

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## APPENDIX C

Kansas City Neighborhood and Park Survey (Full Version)

**KANSAS CITY  
NEIGHBORHOOD AND PARK SURVEY**



*Thank you for sharing your thoughts and opinions!*

# KANSAS CITY NEIGHBORHOOD AND PARK SURVEY

Thank you very much for your willingness to complete this survey. We are interested in learning more about how neighborhood and park factors influence the opportunities Kansas City families have to be physically active. Please read through and answer all questions in the survey.



## NEIGHBORHOOD PERCEPTIONS

1. How long have you lived at your current address? \_\_\_\_\_ years and \_\_\_\_\_ months

The next several questions ask about features of your neighborhood. For all questions, please think about your neighborhood as the area within a 10-15 minute walk from your home.

2. Please rate how important or unimportant each of the following reasons was in your decision to move to your current neighborhood.

	Very Unimportant	Unimportant	Neither	Important	Very Important
a. Affordability/value	1	2	3	4	5
b. Closeness to open space (e.g., parks)	1	2	3	4	5
c. Closeness to job or school	1	2	3	4	5
d. Closeness to public transportation	1	2	3	4	5
e. Desire for nearby shops or services	1	2	3	4	5
f. Ease of walking	1	2	3	4	5
g. Sense of community	1	2	3	4	5
h. Safety from crime	1	2	3	4	5
i. Quality of schools	1	2	3	4	5
j. Closeness to recreation facilities	1	2	3	4	5
k. Access to highways	1	2	3	4	5
l. Other (please specify): _____	1	2	3	4	5

3. The following questions ask about the relationships among the people that live in your neighborhood. Please indicate how much you agree or disagree with each statement.

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
a. People around my neighborhood are willing to help their neighbors.	1	2	3	4	5
b. This is a close knit neighborhood.	1	2	3	4	5
c. People in this neighborhood can be trusted.	1	2	3	4	5
d. People in this neighborhood generally don't get along with each other.	1	2	3	4	5
e. People in this neighborhood do not share the same values.	1	2	3	4	5

**4. What is the main type of housing in your neighborhood? (check only one)**

- Detached single-family housing
- Townhouses, row houses, apartments, or condos of 2-3 stories
- Mix of single-family residences and townhouses, row houses, apartments, or condos
- Apartments or condos of 4-12 stories
- Apartments or condos of more than 12 stories
- Don't know/Not sure

**5. Please tell us how much you agree or disagree with each of these statements about your neighborhood (remember to think about your neighborhood as the area within a 10-15 minute walk from your home).**

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
a. Many shops, stores, markets, or other places to buy things I need are within easy walking distance of my home.	1	2	3	4	DK
b. It is within a 10-15 minute walk to a transit stop (bus, train, trolley, tram) from my home.	1	2	3	4	DK
c. There are sidewalks on most of the streets in my neighborhood.	1	2	3	4	DK
d. The crime rate in my neighborhood makes it unsafe to go on walks at <u>night</u> .	1	2	3	4	DK
e. The crime rate in my neighborhood makes it unsafe to go on walks during the <u>day</u> .	1	2	3	4	DK
f. Our neighborhood streets have good lights at night.	1	2	3	4	DK
g. There are facilities to bicycle in or near my neighborhood, such as special lanes, separate paths or trails, shared use paths for cycles and pedestrians.	1	2	3	4	DK
h. My neighborhood has several free or low cost recreation facilities, such as parks, walking trails, bike paths, recreation centers, playgrounds, public swimming pools, etc.	1	2	3	4	DK
i. I see many people being physically active in my neighborhood doing things like walking, jogging, cycling, or playing sports and active games.	1	2	3	4	DK
j. There is so much traffic on the streets that it makes it difficult or unpleasant to walk in my neighborhood.	1	2	3	4	DK
k. There are many interesting things to look at while walking in my neighborhood.	1	2	3	4	DK
l. There is a safe park in my neighborhood.	1	2	3	4	DK
m. The speed of traffic on most nearby streets is usually slow (30 mph or less).	1	2	3	4	DK
n. Most drivers go faster than the posted speed limits in our neighborhood.	1	2	3	4	DK
o. There are many four-way intersections in my neighborhood.	1	2	3	4	DK
p. There are crosswalks and signals to help walkers cross busy streets in our neighborhood.	1	2	3	4	DK

## ADULT PHYSICAL ACTIVITY AND HEALTH

In this section, we would like to know about your participation in physical activities. Please use the following definitions when responding:

Moderate physical activities cause small increases in breathing or heart rate (e.g., brisk walking, gardening).

Vigorous physical activities cause large increases in breathing or heart rate (e.g., jogging, heavy lifting).

6. How many days per week (0-7) do you participate in physical activity at a moderate intensity level (causes small increases in breathing or heart rate) for at least 10 minutes at a time?

\_\_\_\_ days per week

Do not know

Do not do moderate activities

6b. On days when you do moderate intensity activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?

\_\_\_\_ (hours) : \_\_\_\_ (minutes) per day

Do not know

Not applicable

7. How many days per week (0-7) do you participate in physical activity at a vigorous intensity level (causes large increases in breathing or heart rate) for at least 10 minutes at a time?

\_\_\_\_ days per week

Do not know

Do not do vigorous activities

7b. On days when you do vigorous intensity activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?

\_\_\_\_(hours) : \_\_\_\_ (minutes) per day

Do not know

Not applicable

The next set of questions asks about how often and how many total minutes per week you walk in your neighborhood, first for transportation and then for recreation, health, or fitness.

8. In a usual week, how many times do you walk as a means of transport in your neighborhood, such as going to and from work, walking to shops, or to public transit?

\_\_\_\_ # of times in a usual week

9. In a usual week, please estimate the total time you spend walking as a means of transport in your neighborhood.

\_\_\_\_ (hours) : \_\_\_\_ (minutes) in a usual week

Do not know

Not applicable

10. In a usual week, how many times do you walk for recreation, health, or fitness in or around your neighborhood?

\_\_\_\_ # of times in a usual week

11. In a usual week, please estimate the total time you spend walking for recreation, health, or fitness in or around your neighborhood.

\_\_\_\_ (hours) : \_\_\_\_ (minutes) in a usual week

Do not know

Not applicable

12. Sometimes people encounter obstacles to being physically active. Please rate how confident you are that you could participate in physical activity if the following situations were to occur.

I am confident I could participate when:	Not at all Confident	Slightly Confident	Moderately Confident	Very Confident	Completely Confident
a. I am tired.	1	2	3	4	5
b. I am in a bad mood.	1	2	3	4	5
c. I feel I don't have the time.	1	2	3	4	5
d. I am on vacation.	1	2	3	4	5
e. It is raining or snowing.	1	2	3	4	5

13. Think about all the physical activity you do in a usual week (7 days). Please indicate the number of minutes of your activity that occurs in each of the following locations:

Park/Outdoor recreation area \_\_\_\_\_ (hours) : \_\_\_\_\_ (minutes) in a usual week  
 Fitness center \_\_\_\_\_ (hours) : \_\_\_\_\_ (minutes) in a usual week  
 Home (indoors or outdoors) \_\_\_\_\_ (hours) : \_\_\_\_\_ (minutes) in a usual week  
 Neighborhood streets/sidewalks \_\_\_\_\_ (hours) : \_\_\_\_\_ (minutes) in a usual week  
 School \_\_\_\_\_ (hours) : \_\_\_\_\_ (minutes) in a usual week  
 Work \_\_\_\_\_ (hours) : \_\_\_\_\_ (minutes) in a usual week  
 Other (please specify): \_\_\_\_\_ \_\_\_\_\_ (hours) : \_\_\_\_\_ (minutes) in a usual week

14. Over the past 30 days, on average, how many hours per day did you sit and watch TV or videos?

- Less than 1 hour     1 hour     2 hours     3 hours     4 hours     5 or more hours

15. Over the past 30 days, on average, how many hours per day did you use a computer or play computer games [outside of work]?

- Less than 1 hour     1 hour     2 hours     3 hours     4 hours     5 or more hours

16. Do you currently suffer from any of the following health concerns? (*check all that apply*)

- Heart problems (e.g., heart disease, heart attack, high blood pressure, etc.)  
 Cancer  
 Diabetes  
 Osteoporosis  
 Depression or other mental health concern  
 Asthma/allergies  
 Disability (*please describe*) \_\_\_\_\_  
 Other (*please list*) \_\_\_\_\_

17. Compared to other people your age, would you say your overall health is:

- Poor     Fair     Good     Very good     Excellent     Not sure

## PARK USAGE AND PERCEPTIONS

Please answer the following questions about park usage. By park, we mean a public park or outdoor recreation area in the community that is designed for active or passive use.

### 18. Within the last month (i.e., last 30 days), did you visit a park?

- No – skip to question 23       Yes – please answer the following questions

#### 18b. How many days in the last month (i.e., last 30 days) did you visit a park?

\_\_\_\_ days in the last month visited a park       Do not know

#### 18c. During your last park visit, how much time did you spend in the park?

\_\_\_\_ (hours) : \_\_\_\_ (minutes) during last park visit       Do not know

#### 18d. Of that time you said you spent in a park during your last park visit, how much time did you spend being physically active? By physically active we mean doing any physical movement rather than sitting (e.g., walking, biking).

\_\_\_\_ (hours) : \_\_\_\_ (minutes) being physically active during last park visit       Do not know

### 19. Who were you with on your last park visit? (check all that apply)

- Alone                       Friends                       Members of an organized group  
 Family                       Pet                               Other (please specify): \_\_\_\_\_

### 20. What activities did you do during your last park visit? (check all that apply)

- Walking/hiking               Picnicking                       Wildlife viewing (e.g., birdwatching)  
 Jogging/running               Relaxing                         Viewing/photographing nature  
 Biking                         Reading                         Sightseeing  
 Rollerblading                 Fishing                         Playing with kids  
 Group sports                 Tennis                         Swimming  
 Martial arts/Tai Chi         Yoga                             Other (please specify): \_\_\_\_\_

### 21. What facility areas did you use during your last park visit? (check all that apply)

- Trails                         Playground                       Football/Soccer Field  
 Basketball Court               Off-Leash Dog Park               Fitness Equipment/Stations  
 Baseball Field                 Lake/Beach                       Swimming Pool/Splash Pad  
 Tennis Court                 Skate Park                       Picnic Area  
 Volleyball Court               Open/Green Space               Other (please specify): \_\_\_\_\_

### 22. Which of the following best describes your activity level on your last park visit? (check only one)

- Mostly sitting  
 Mostly light activities (e.g., standing, walking, or strolling at a slow pace)  
 Mostly moderate activities (e.g., walking or biking at a moderate pace)  
 Mostly vigorous activities (e.g., jogging, soccer, basketball)  
 Don't know

23. Parks are places where people can potentially go to be physically active. When thinking about being active in a park, how important or unimportant is each of the following site attributes?

Site Attributes	Very Unimportant	Unimportant	Neither	Important	Very Important
a. Benches	1	2	3	4	5
b. Peacefulness/quiet	1	2	3	4	5
c. Feeling safe from crime	1	2	3	4	5
d. Feeling safe from injury	1	2	3	4	5
e. Easy to get there	1	2	3	4	5
f. Lighting	1	2	3	4	5
g. Drinking fountains	1	2	3	4	5
h. Restrooms	1	2	3	4	5
i. Parking	1	2	3	4	5
j. Cleanliness of park areas	1	2	3	4	5
k. Maintenance of park areas	1	2	3	4	5
l. Beauty	1	2	3	4	5
m. Close to home	1	2	3	4	5
n. Trash cans	1	2	3	4	5
o. Food/vending machines	1	2	3	4	5
p. Being near water	1	2	3	4	5
q. Close to public transit	1	2	3	4	5
r. Shade trees	1	2	3	4	5
s. Picnic area	1	2	3	4	5
t. Bike racks	1	2	3	4	5
u. Other (please specify): _____	1	2	3	4	5

24. How long would it take you to walk to your nearest park?

- 1-5 minutes    
 6-10 minutes    
 11-20 minutes    
 21-30 minutes    
 31+ minutes

25. The following questions ask about the parks in your neighborhood. Please indicate how much you agree or disagree with each statement.

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
a. Parks in my neighborhood are clean.	1	2	3	4	5
b. Parks in my neighborhood have facilities that I am interested in.	1	2	3	4	5
c. Parks in my neighborhood are used by many people.	1	2	3	4	5
d. Parks in my neighborhood are attractive.	1	2	3	4	5
e. Parks in my neighborhood are safe.	1	2	3	4	5
f. Parks in my neighborhood are well-maintained.	1	2	3	4	5
g. Parks in my neighborhood are a benefit to the people who live here.	1	2	3	4	5



26. Listed below are reasons some people do not participate in physical activity at a park at all or as often as they would like. Please tell us to what extent the following problems/concerns keep you from participating in physical activity at all or as often as you would like in a park, even if you have not used a park recently for physical activity.

Problems/Concerns	Not A Problem	A Minor Problem	A Moderate Problem	A Major Problem
a. No one to be physically active with	1	2	3	4
b. Fear of crime from other people in the park	1	2	3	4
c. Lack of scenic beauty	1	2	3	4
d. Poorly maintained park (e.g., excess trash, run down facilities)	1	2	3	4
e. Park is not designed for the activities I want to do	1	2	3	4
f. Personal safety concerns (e.g., fear of injury, poorly maintained equipment)	1	2	3	4
g. Personal health problems (e.g., difficulty walking)	1	2	3	4
h. Limited park hours	1	2	3	4
i. Parks are too far away from where I live	1	2	3	4
j. I am physically active elsewhere	1	2	3	4
k. Don't like to be physically active	1	2	3	4
l. Too many family obligations	1	2	3	4
m. Don't have enough time	1	2	3	4
n. Not in good enough shape	1	2	3	4
o. Friends/family don't have time	1	2	3	4
P. Lack information on physical activity opportunities at the park	1	2	3	4
q. Don't have enough physical energy	1	2	3	4
r. Friends/family prefer other activities	1	2	3	4
s. Lack transportation to the park	1	2	3	4
t. Fear of prejudice from others based on my race/ethnicity	1	2	3	4
u. Park is too crowded	1	2	3	4
v. Lack support from friends/family	1	2	3	4
w. Don't have the right skills	1	2	3	4
x. Don't feel welcome at the park	1	2	3	4
y. Self-conscious when physically active	1	2	3	4
z. Conflict with other park users	1	2	3	4
aa. Friends/family skill levels different than mine	1	2	3	4

27. Do you have any other comments or suggestions about Kansas City parks?



34. Thinking about the same child, please indicate all of the places that child has been physically active in the **last 30 days**. (check all that apply)

- Park/Outdoor recreation area
- Fitness center
- Home (indoors or outdoors)
- Neighborhood streets/sidewalks
- School
- Work
- Other (please specify): \_\_\_\_\_

35. In a usual week, how many days does this child walk or bike **to** school? \_\_\_\_\_ days  Not applicable

36. In a usual week, how many days does this child walk or bike **from** school? \_\_\_\_\_ days  Not applicable

37. Within the **last month** (i.e., last 30 days), did this child visit a park?

- No – skip to question 42
- Yes – please answer the following questions
- Do not know

37b. How many days in the **last month** (i.e., last 30 days) did this child visit a park?

\_\_\_\_\_ days in the last month visited a park  Do not know

38. When this child travels to a park, how does he or she **usually** get there? (check only one)

- Walk
- Bike
- Driven in a car
- Public transit
- Other \_\_\_\_\_

39. Which of the following best describes the child's activity level during the **last park visit**? (check only one)

- Mostly sitting
- Mostly light activities (standing, walking or strolling at a slow pace)
- Mostly moderate activities (walking at a moderate pace, playing tennis)
- Mostly vigorous activities (jogging, soccer, playing basketball)
- Cannot indicate because I was not with the child during the last park visit

40. What activities did the child do during the **last park visit**? (check all that apply)

- Cannot indicate because I was not with the child during the last park visit
- Walking/hiking
- Jogging/running
- Biking
- Rollerblading
- Group sports
- Martial arts/Tai Chi
- Picnicking
- Relaxing
- Reading
- Fishing
- Tennis
- Yoga
- Wildlife viewing (e.g., birdwatching)
- Viewing/photographing nature
- Sightseeing
- Playing with friends or parents
- Swimming
- Other (please specify): \_\_\_\_\_

41. What facility areas did the child use during the **last park visit**? (check all that apply)

- Cannot indicate because I was not with the child during the last park visit
- Trails
- Basketball Court
- Baseball Field
- Tennis Court
- Volleyball Court
- Playground
- Off-Leash Dog Park
- Lake
- Skate Park
- Open/Green Space
- Football/Soccer Field
- Fitness Equipment/Stations
- Swimming Pool/Splash Pad
- Picnic Area
- Other (please specify): \_\_\_\_\_

Please tell us a little bit more about this child. Please be assured that all information will be kept confidential. Once you have returned your survey, all specific address information will be kept separate from the answers you provide.

42. What is this child's gender?  Male  Female
43. What year was this child born? \_\_\_\_\_ year
44. What is this child's current height? \_\_\_\_\_ feet \_\_\_\_\_ inches
45. What is this child's current weight? \_\_\_\_\_ lbs
46. Is this child of Hispanic or Latino origin?  Yes  No
47. What racial category best describes this child? (*check all that apply*)
- |                                                           |                                                                    |
|-----------------------------------------------------------|--------------------------------------------------------------------|
| <input type="checkbox"/> American Indian or Alaska Native | <input type="checkbox"/> Native Hawaiian or Other Pacific Islander |
| <input type="checkbox"/> Asian                            | <input type="checkbox"/> White                                     |
| <input type="checkbox"/> Black                            | <input type="checkbox"/> Other ( <i>please specify</i> ): _____    |
48. Is this child eligible to receive school breakfast or lunch for free or at a reduced cost?
- Yes  No  Do not know

49. Is there any additional information you wish to provide about this child or his/her activities?



**Please turn to the back page to answer a few final questions about your household ...**

## HOUSEHOLD INFORMATION

Finally, please tell us a bit more about you and your household. All information will be kept confidential. Once you have returned your survey, all specific address information will be kept separate from the answers you provide.

50. What is your gender?       Male     Female
51. What year were you born?      \_\_\_\_\_ year
52. What is your current height?      \_\_\_\_\_ feet \_\_\_\_\_ inches
53. What is your current weight?      \_\_\_\_\_ lbs
54. Are you of Hispanic or Latino origin?     Yes     No
55. What racial category best describes you? *(check all that apply)*
- |                                                           |                                                                    |
|-----------------------------------------------------------|--------------------------------------------------------------------|
| <input type="checkbox"/> American Indian or Alaska Native | <input type="checkbox"/> Native Hawaiian or Other Pacific Islander |
| <input type="checkbox"/> Asian                            | <input type="checkbox"/> White                                     |
| <input type="checkbox"/> Black                            | <input type="checkbox"/> Other <i>(please specify)</i> _____       |
56. What is your current marital status? *(check only one)*
- |                                                |                                   |                                                         |
|------------------------------------------------|-----------------------------------|---------------------------------------------------------|
| <input type="checkbox"/> Single, never married | <input type="checkbox"/> Divorced | <input type="checkbox"/> Married                        |
| <input type="checkbox"/> Separated             | <input type="checkbox"/> Widowed  | <input type="checkbox"/> Living with a domestic partner |
57. What is the highest level of education you have completed? *(check only one)*
- |                                                |                                                  |                                                   |
|------------------------------------------------|--------------------------------------------------|---------------------------------------------------|
| <input type="checkbox"/> Less than high school | <input type="checkbox"/> Some college            | <input type="checkbox"/> Four year college degree |
| <input type="checkbox"/> High school/GED       | <input type="checkbox"/> Two-year college degree | <input type="checkbox"/> Advanced degree          |
58. What is your current work status? *(check only one option that indicates your primary role)*
- |                                             |                                                            |                                            |
|---------------------------------------------|------------------------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> Employed full-time | <input type="checkbox"/> Retired                           | <input type="checkbox"/> Full-time student |
| <input type="checkbox"/> Employed part-time | <input type="checkbox"/> Unemployed                        | <input type="checkbox"/> Part-time student |
| <input type="checkbox"/> Homemaker          | <input type="checkbox"/> On disability or other work leave | <input type="checkbox"/> Other _____       |
59. What is your annual household income before taxes? *(check only one)*
- |                                             |                                          |                                            |
|---------------------------------------------|------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> less than \$25,000 | <input type="checkbox"/> \$50,000-74,999 | <input type="checkbox"/> \$100,000-149,999 |
| <input type="checkbox"/> \$25,000-49,999    | <input type="checkbox"/> \$75,000-99,999 | <input type="checkbox"/> \$150,000 or more |
60. How many children under the age of 18 live in your household?      \_\_\_\_\_ # of children
61. How many total motor vehicles are owned by the members of your household? *(that are driven at least once per week)*      \_\_\_\_\_ # of vehicles
62. What is your five-digit zip code? \_\_\_\_\_ zip code

***You're done! Thank you very much for completing this survey.***

***Please return the survey in the white postage-paid envelope provided. Don't forget to fill out the enclosed blue card for a chance to win a prize and return it in the envelope with your survey!***

## APPENDIX D

Kansas City Neighborhood and Park Survey (Shortened Version)

# KANSAS CITY NEIGHBORHOOD AND PARK SURVEY

Thank you very much for your willingness to complete this short survey. We are interested in learning more about how neighborhood and park factors influence the opportunities Kansas City families have to be physically active. Please read through and answer all questions on the front and back of this page.



## ADULT ACTIVITIES AND INFLUENCES

In this section, we would like to know about your participation in physical activities. Please use the following definitions when responding:

Moderate physical activities cause small increases in breathing or heart rate (e.g., brisk walking, gardening).

Vigorous physical activities cause large increases in breathing or heart rate (e.g., jogging, heavy lifting).

1. How many days per week (0-7) do you participate in physical activity at a moderate intensity level (causes small increases in breathing or heart rate) for at least 10 minutes at a time?

\_\_\_ days per week

Do not know

Do not do moderate activities

1b. On days when you do moderate intensity activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?

\_\_\_ (hours) : \_\_\_ (minutes) per day

Do not know

Not applicable

2. How many days per week (0-7) do you participate in physical activity at a vigorous intensity level (causes large increases in breathing or heart rate) for at least 10 minutes at a time?

\_\_\_ days per week

Do not know

Do not do vigorous activities

2b. On days when you do vigorous intensity activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?

\_\_\_ (hours) : \_\_\_ (minutes) per day

Do not know

Not applicable

Please answer the following questions about park usage. By park, we mean a public park or outdoor recreation area in the community that is designed for active or passive use.

3. Within the last month (i.e., last 30 days), did you visit a park?

No – skip to question 4

Yes – please answer the following questions

3b. How many days in the last month (i.e., last 30 days) did you visit a park?

\_\_\_ days in the last month visited a park

Do not know

3c. During your last park visit, how much time did you spend in the park?

\_\_\_ (hours) : \_\_\_ (minutes) during last park visit

Do not know

3d. Of that time you said you spent in a park during your last park visit, how much time did you spend being physically active? By physically active, we mean doing any physical movement rather than sitting (e.g., walking, biking).

\_\_\_ (hours) : \_\_\_ (minutes) being physically active during last park visit

Do not know

## CHILD ACTIVITIES AND INFLUENCES

4. Are there any children (3-17 years old) currently living in your household?

No – Please skip to question 13 on the back page

Yes – Please continue at the top of the back page

For the following questions, please think about the child (3-17 years old) in your household that has the next upcoming birthday.

Please tell us about that child's physical activity participation. "MODERATE TO VIGOROUS PHYSICAL ACTIVITY" means activities that increase heartbeat or breathing, including brisk walking, swimming, biking, gardening, running or any other activity that causes increases in breathing and heart rate.

5. Thinking about the child's moderate to vigorous physical activities, over the past 7 days, on how many days was this child moderately to vigorously active for a total of at least 60 minutes per day?

\_\_\_\_\_ days in past 7 days  Do not know

6. Within the last month (i.e., last 30 days), did this child visit a park?

No – skip to question 7  Yes – please answer the following question  Do not know

- 6b. How many days in the last month (i.e., last 30 days) did this child visit a park?

\_\_\_\_\_ days in the last month visited a park  Do not know

#### HOUSEHOLD INFORMATION

Finally, please tell us a bit more about this child and yourself. Please be assured that all information will be kept confidential. Once you have returned your survey, all specific address information will be kept separate from the answers you provide.

##### *About the child...*

7. What is this child's gender?  Male  Female
8. What year was this child born? \_\_\_\_\_ year
9. What is this child's current height? \_\_\_\_\_ feet \_\_\_\_\_ inches
10. What is this child's current weight? \_\_\_\_\_ lbs
11. Is this child of Hispanic or Latino origin?  Yes  No
12. What racial category best describes this child? (*check all that apply*)
- American Indian or Alaska Native  Native Hawaiian or Other Pacific Islander
- Asian  White
- Black  Other (*please specify*): \_\_\_\_\_

##### *About you...*

13. What is your gender?  Male  Female
14. What year were you born? \_\_\_\_\_ year
15. What is your current height? \_\_\_\_\_ feet \_\_\_\_\_ inches
16. What is your current weight? \_\_\_\_\_ lbs
17. Are you of Hispanic or Latino origin?  Yes  No
18. What racial category best describes you? (*check all that apply*)
- American Indian or Alaska Native  Native Hawaiian or Other Pacific Islander
- Asian  White
- Black  Other (*please specify*) \_\_\_\_\_
19. What is your annual household income before taxes? (*check only one*)
- less than \$25,000  \$50,000-74,999  \$100,000-149,999
- \$25,000-49,999  \$75,000-99,999  \$150,000 or more

**Thank you very much for completing this survey. Please return in the envelope provided.**