

AN EMPIRICAL STUDY OF COMMUNITY AND FAMILY INTERVENTIONS TO  
PROMOTE PHYSICAL ACTIVITY AMONG LATINO YOUTH

BY

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## Abstract

Physical inactivity contributes to risks for chronic disease and premature death (World Health Organization, 2010). Community coalitions play an important role in addressing and preventing chronic diseases (Butterfoss, Goodman, & Wandersman, 1993). This dissertation examines two intervention efforts related to the Latino Health for All Coalition's action plan, using an ecological perspective (McLeroy, Bibeau, Steckler, & Glanz, 1988).

The first study involved a universal intervention to promote physical activity among Latino boys and girls (age 5-15) in Kansas City by offering structured soccer sessions consisting of soccer drills and informal games. These structured soccer sessions were promoted through an informal, flyer-based campaign. An empirical case study design and related measures were used to answer four questions: 1) How effective was the campaign in attracting overweight and obese Latino youth? (involved analysis of a paper-and-pencil survey by parents of participating youth), 2) How frequently did participants attend? (involved analysis of weekly attendance records), 3) How much moderate-to-vigorous physical activity did participants accumulate during these informal soccer sessions? (involved the use of Actigraph accelerometers), and 4) How satisfied were parents and youth with these physical activity opportunities? (involved analysis of a paper-and-pencil survey at the concluding session).

Results show that 74 youth attended at least one of the weekly soccer sessions (90.5% Hispanic/Latino, 43.2% overweight or obese). On average, youth attended 4.2 sessions; there was no difference in attendance rate by gender ( $t(40)=2.08$ ,  $p=0.48$ ) or body mass index category [ $F(2, 49) = 0.16$ ,  $p = 0.85$ ]. A convenience sample of 12 participants accumulated 18.8 to 22.2 minutes of moderate-to-vigorous physical activity during a single soccer session. Both children and parents expressed high levels of satisfaction with the structured soccer sessions. In

conclusion, these structured soccer sessions enabled a diverse group of Latino children and youth to accumulate about a third of their daily requirement of physical activity, in an enjoyable way.

The second study examined a targeted family-based intervention to promote physical activity in home settings. It involved Latino children (3 boys, 2 girls), ages 5 to 7. The intervention occurred during the summer (June – August). Parents were taught to set weekly physical activity goals for their children, develop weekly behavioral contracts, and reinforce short bouts of physical activity. Children wore Actigraph accelerometers during waking hours to monitor changes in physical activity levels. The U.S. Department of Health and Human Services guidelines for physical activity were reviewed with parents, followed by weekly accelerometer feedback on their child’s physical activity level. A multiple baseline design was used to examine the effects of the intervention on daily levels of moderate-to-vigorous physical activity.

The intervention resulted in large changes in physical activity for one participant and minimal increases in daily levels of moderate-to-vigorous physical activity for three of the remaining four participants. Factors that explain the variance in initial increase in physical activity (e.g., the home and neighborhood environment) were explored. Parents were able to implement most intervention components well, with the exception of their ability to consistently reinforce 10-minute bouts of physical activity. Finally parents expressed high levels of satisfaction with the intervention. Targeted interventions that train parents to set goals and develop behavioral contracts show promise for increasing the physical activity levels of children. Future research is needed to determine the longer-term effects of such interventions. Finally, this dissertation study provides an initial assessment of the Latino Health for All Coalition using preliminary measures of process outcomes (e.g., partners engaged, interventions developed). The coalition’s effects were explored across all ecological levels—individual, family, organizational,

community—posed by McLeroy et al. (1988). Health-based community coalitions can play an important role in assuring the prevention of chronic diseases for all groups within the community.

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Physical inactivity presents a worldwide health threat that leads to chronic disease and premature mortality in the United States, and globally (World Health Organization, 2010). Children should accumulate 60 minutes of moderate-to-vigorous of physical activity every day (U.S. Department of Health and Human Services, 2008). Moderate-to-vigorous physical activity is the equivalent of brisk walking to running; children should get a combination of aerobic activity (e.g., running) and muscle and bone strengthening activity (e.g., hopscotch, pushups). However, recent data from the National Health and Nutrition Examination Survey (NHANES) show that only 42% of youth ages 6 to 11 meet this guideline, and only 8% of youth ages 12 to 15 meet it (Centers for Disease Control and Prevention, 2010b). The result of this inactivity has contributed to children and youth being overweight/or obese (Ebbeling, Pawlak, & Ludwig, 2002), having diabetes (Cali & Caprio, 2008), and experiencing metabolic syndrome (Weiss et al., 2004). Further, the Institute of Medicine (2007) has cited a significant under investment in addressing childhood obesity and related chronic diseases compared to other public health issues such as infectious disease.

Although children and adolescents do not typically develop chronic diseases, such as diabetes or cardiovascular diseases, regular physical activity has been linked to positive health outcomes in adult years (U.S. Department of Health and Human Services, 2008). Certain ethnic and racial minorities face a higher prevalence of chronic diseases. Braveman (2006) cites multiple definitions of health disparities, but poses a brief definition of, “Health disparities/inequalities are potentially avoidable differences in health (or in health risks that policy can influence) between groups of people who are more and less advantaged socially; these differences systematically place socially disadvantaged groups at further disadvantage on health” (p. 180). For example, Mexican American adults are two times more likely than non-Hispanic

white adults to have been diagnosed with diabetes, and 1.6 times as likely to die from diabetes (U.S. Department of Health and Human Services, 2009). Health disparities like these can pose a serious threat to population-wide health, as Latinos are a growing segment of the population, estimated to be over 48 million – 15.8% of the population in the United States (U.S. Census Bureau, n.d.-b). This calls for efforts to promote physical activity and health that focus on changing environmental conditions for Hispanic and Latino populations (Centers for Disease Control and Prevention, 2010a)

Children face a variety of barriers to getting the physical activity they need to stay healthy. Some of these barriers relate to individual-level factors. For example, gender is related to physical activity, as girls tend to be less active than boys (Strauss, Rodzilsky, Burack, & Colin, 2001). Family-level factors such as inactive parents also seem to play a role in physical inactivity among children and youth (Saelens & Kerr, 2008). On the neighborhood level, a lack of structured opportunities negatively affects physical activity among children. One neighborhood-level factor related to physical activity is access to facilities. Gordon-Larsen, Nelson, Page, & Popkin (2006) analyzed neighborhood data of over 42,000 adolescents, finding that fewer facilities available for physical activity was associated with lower levels of physical activity as well as an increased likelihood of obesity.

Physical activity is a complex behavior that is affected by a variety of factors at multiple levels. McLeroy, Bibeau, Steckler, and Glanz (1988) posed an ecological model of intervention that considers both individual and social/environmental factors. These factors included: 1) Intrapersonal factors, 2) Interpersonal processes and primary groups, 3) Institutional factors, 4) Community factors, and 5) Public policy. This ecological model posits the importance of environmental change to affect the behavior of individuals, and that individuals can operate on



their environments to facilitate change. Table 1 provides the definition of each level as well as physical activity-specific examples.

Table 1

*Ecological Levels for Intervention, Definitions, and Physical Activity Application*

Ecological Level	Definition	Physical Activity Example
1. Intrapersonal factors	“Characteristics of the individual such as knowledge, attitudes, behavior, self-concept, skills, etc.” (p. 355).	Individual physical activity behaviors (e.g., engagement in walking, soccer)
2. Interpersonal processes and primary groups	“Formal and informal social network and social support systems” (p. 355).	The family (i.e., their support for physical activity)
3. Institutional factors	“Social institutions with organizational characteristics, and formal (and informal) rules and regulations for operation” (p. 355).	Opportunities in school to be active at recess
4. Community factors	“Relationships among organizations, institutions, and informal networks within defined boundaries” (p. 355).	Other children to be active with (mediating structures) A multi-sector coalition that promotes physical activity (relationship among organizations) Controlling if an initiative to open a new park is placed on the public agenda (community as power)
5. Public policy	“Local, state, and national laws and policies” (p. 355).	Local law requiring a walkable community

Numerous intervention studies have been conducted to increase physical activity and reduce risk for obesity and other health conditions, across these ecological levels. For example, Trevino et al. (2004) addressed intrapersonal factors – primarily knowledge about physical activity and its consequences – by offering over 3,000 elementary students a 50-session health education curriculum. Neumark-Sztainer, Story, Hannan, and Rex (2003) also addressed intrapersonal factors by offering bi-weekly social support classes (along with other intervention components) to high-school aged girls to address self/body image.

To address interpersonal processes and primary groups, programs have been offered to families such as healthy lifestyle interventions. Barkin, Gesell, Poe, & Ip (2011) aimed to address family-level factors by offering parent-child dyads behavior modification via a counselor trained in motivational interviewing, to affect both attitudes and behavior related to physical activity. Other interventions at the interpersonal/primary groups-level have used home and community-based physical activity curricula for mothers and daughters to exercise together (Ransdell et al., 2003), as well as family-based walking programs (Rooney, Gritt, Havens, Mathiason, & Clough, 2005).

Institutional factors have been addressed by creating physical activity opportunities in school-based settings (Haerens, De Bourdeaudhuij, Maes, Cardon, & Deforche, 2007), during Sunday school church services (Trost, Tang, & Loprinzi, 2009), and during community activities such as Girl Scouts (Rosenkranz, Behrens, & Dzewaltowski, 2010). Addressing community factors has been done in multiple ways as well. For example, Weintraub et al. (2008) addressed mediating structures through the creation of coed soccer teams for obese children. McNeil, Wilson, Siever, Ronca, and Mah (2009) addressed relationships among families and organizations through an intervention in which an outreach worker helped parents identify opportunities in the community for their children (aged 3 to 5) to be physically active through recreational sports and other types of physical activities.

Public policy to promote physical activity has largely involved community-level and street-level urban design. The Centers for Disease Control and Prevention has recommended policy and environmental strategies, such as connected streets with sidewalks, as ways to promote physical activity (Heath et al., 2006). However, these strategies do not target children and youth specifically. Most policies that target youth have been those to promote physical

activity in school settings through physical education or changes to physical education (Haerens et al., 2007).

Studies that examine physical activity in applied settings typically use combinations of measurement approaches including motion sensors such as pedometers and accelerometers, self-report measures such as the 7-day physical activity recall interviews (Sallis, Buono, Roby, Micale, & Nelson, 1993), or the product of physical activity (e.g., changes in fitness, changes in physiology such as Body Mass Index). In terms of measuring the physical activity in applied (also known as free-living) settings, each measurement approach has strengths and weaknesses. For example, measurement of physical activity via accelerometers has been shown to be a valid and reliable measure (Rowlands, 2007). However, it provides no information about the context or the type of physical activity done. Self-report measures are subject to forgetting and bias, however, validated self-report measures provide important detail about the actual activity such as type, setting, etc. In combination, an objective measure could detect changes in physical activity (and the corresponding intensity) and a self-report or self-monitoring measure could provide more context about the physical activity and the setting in which it occurs.

Among large child and adolescent intervention studies, increases in physical activity are often small. For example, the Haerens et al. (2007) study involved implementing an intervention in fifteen schools that involved increasing school opportunities for physical activity (both during and after school) and the provision of computerized physical activity advice for participants. Some participants also received parental support, involving meetings with parents to increase home-based physical activity, as well as physical activity information sent home. A subsample of participants wore accelerometers for 6 days (four weekdays and 2 weekend days). Results show small (but statistically significant) differences existed among the intervention and control groups. Physical activity of moderate-to-vigorous intensity significantly increased in the “intervention + parental

support” group (N = 66) by 3.9 minutes per day as compared to a significant decrease of 6.7 minutes per day in the control group (N = 67).

Another large physical activity study - the Girls’ health Enrichment Multi-site Studies (GEMS) involved the implementation of obesity prevention interventions in collaboration among four research centers (Obarzanek & Pratt, 2003). Effects of different interventions on physical activity were also minimal. Two of the four centers (Stanford University and the University of Memphis) tested interventions to prevent excessive weight gain in African American girls from 8 to 10 years old, using a clinical trial approach among large groups (approximately 300 girls in each study). Stanford’s intervention, led by Robinson et al. (2010), was an after-school dance program and home-based intervention to reduce time with television-based activities (the control group received information-based health education). The Memphis intervention, led by Klesges, et al. (2010), involved the provision of group behavioral counseling (control participants received self-esteem and social efficacy counseling).

Body mass index was the main outcome measure in both studies, while change in physical activity was a secondary measure. In the Stanford GEMS study, Robinson et al. (2010) found no statistically significant difference in BMI change per year (intervention group - control group) with a 0.04 adjusted difference in change per year (95% CI, -0.18 to 0.27). Similarly in the Memphis GEMS the change in BMI per year was not significantly different at a 0.09 adjusted difference in change per year (95% CI, -0.40 to 0.58). For physical activity, 3-day accelerometer measures were taken annually across the 2-year study period for both the Stanford GEMS and the Memphis GEMS study. For the Stanford GEMS study, results show the change in minutes per day of moderate-to-vigorous physical activity for the intervention group – control group was non-significant for both weekdays (0.41, CI = -1.26 to 2.07) and weekends (0.51, CI = 1.42 to 2.44). In the Memphis GEMS study, minutes per day of moderate-to-vigorous physical

activity was not significantly different for the intervention group (21.1 minutes/day) compared to the alternative intervention (20.2 minutes/day).

The Trial of Activity for Adolescent Girls (TAGG) involved a school and community intervention to increase moderate-to-vigorous physical activity (Webber et al., 2008). This study involved a cross sectional sample of girls in 6<sup>th</sup> grade (N = 1,721) in 2003, and 8<sup>th</sup> grade in 2005 (N = 3,504) and 2006 (N = 3,502) who came from six states. The intervention consisted of: a) school changes (six-lesson health education, physical education classes that promoted MVPA for 50% or more of the class), b) community changes (the development and promotion of physical activity programs before and after school), and c) social marketing promotions (school-wide messages to increase acceptance of physical activity). It also included a “program champions” component to help sustain physical activity opportunities and advocate for new opportunities after the two-year intervention period. Moderate-to-vigorous physical activity was measured objectively, using 7-day accelerometer measures among intervention schools and control school (who received no intervention). After the two-year intervention there were no differences in moderate-to-vigorous physical activity among participants in intervention schools verses control schools. One year after the intervention, girls in the intervention schools (that had a “program champion”) were active for about 1.6 minutes more per day than girls in control schools.

These studies offer a variety of intervention approaches, in a variety of settings, to a diverse group of participants. However, these studies have typically yielded small or no changes in physical activity levels. While most studies site the use of a theory (e.g., the Social Cognitive Theory), they fail to provide information on the process of change, often providing a pre and post measure among an intervention group and a control group. Finally, many of these studies fail to

account for ecological variables (e.g., the home/family setting, the neighborhood setting) that may influence physical activity.

The present dissertation research study was conducted as a nested study within a larger research-community partnership involving the Latino Health for All Coalition (LHFA). The LHFA Coalition emerged in 2008 with support from a National Institutes of Health (National Center on Minority Health and Health Disparities) grant awarded to the University of Kansas Work Group for Community Health and Development in partnership with the University of Kansas Medical Center and El Centro, Inc. The LHFA Coalition's mission is to "reduce diabetes and cardiovascular disease among Latinos in Kansas City/Wyandotte County through a collaborative partnership to promote healthy nutrition, physical activity, and access to health services." The Coalition is made up of about 45 representatives from organizations in Kansas City that have a stake in Latino health. These individuals represent safety net clinics, youth organizations, translation service organizations, churches, and members of the local Hispanic media. Both studies in this dissertation come from the work of the dissertation's author to address physical activity as a "liaison" from the University of Kansas scientific team to the LHFA Coalition's physical activity action committee. As a "liaison" the author helped support coalition members who are promoting physical activity, as well as lead implementation and study of interventions to promote physical activity.

In November 2008, the Latino Health for All Coalition used a community-based participatory research approach (CBPR) to develop an action plan to guide the promotion of physical activity in Kansas City, Kansas (Minkler & Wallerstein, 2008). The physical activity committee identified seven priority strategies as part of its community action plan for increasing physical activity: 1) Modify community practices to increase access to facilities that will enable

community residents to be more physically active, 2) Implement Latin dance clubs/tournaments that will promote physical activity through dance, 3) Establish programs that educate community residents about physical activity (similar to the lay health advisor Promotoras model), 4) Establish programs that educate professionals about assuring physical activity in their patients, 5) Establish community conditions that enable residents to engage in regular forms of leisure physical activity, 6) Modify softball fields (and other public field space) to enable community residents to play soccer, and 7) Implement soccer tournaments that will promote physical activity.

This dissertation examines the effects of two intervention research studies grounded in the community-determined action plan. The first study explores a universal approach available to all youth at the community-level; it examines the effects of structured soccer sessions on physical activity on physical activity among Latino children and youth in Kansas City (ages 5 to 12). The second intervention study uses a targeted approach with obese youth at the family level. It followed up with obese youth identified in Study 1, with a home-based intervention to promote physical activity implemented by parents. It used goal-setting and reinforcement of unstructured physical activity implemented by parents with their obese child (age 5 to 7).

### **Study 1: Empirical Study of Physical Activity During Structured Soccer Sessions**

Numerous studies cite the relationship between environmental factors and physical activity. A review by Sallis, Prochaska, and Taylor (2000) of over 100 studies found that access to both facilities and programs that offered physical activity were related to higher levels of physical activity among youth. School and community sports also offer opportunities for structured physical activity for youth. Participation in sports has been associated with increased levels of physical activity among youth. Wickel and Eisenmann (2007) obtained an objective

measure of daily physical activity among 119 boys between 6 to 12 years of age. Days that involved participation in youth sports resulted in an accumulation of about 30 more minutes of physical activity per day, compared to non-sports days. Further, Trost et al., (1997) found that participation in community sports predicted levels of moderate or vigorous physical activity among 202 boys and girls in rural settings. Mirza et al., (2004) found that participation with one or more sports teams was inversely related to overweight among 309 Hispanic youth between the ages of 6 to 19.

However, participation in youth sports is not evenly distributed among children. Brustad, Vilhjalmsson, and Fonseca (2008) note the emphasis on competitive youth sports as well as the exclusion of youth who are less skilled in sports. Kien and Chiodo (2003) argue that competitive sports could be a negative experience for youth who possess fewer athletic skills. Availability of youth sports programs – especially in lower income, urban areas may be limited. For instance, Ewing, Gano-Overway, Branta, and Seefeldt (2002) report a disparity between youth sport opportunities in urban Detroit, compared to suburban Detroit. Approximately 10% of urban Detroit youth participate in organized sports, compared to over 75% of suburban Detroit youth. For urban youth who have opportunities to participate in organized sports, other barriers such as cost of equipment or participant fees make participation less likely.

Pate, Trost, Levin, and Dowda (2000) conducted one of the most comprehensive analyses of youth sports data from the Youth Risk Behavior Surveillance Survey. The analysis examined school and non-school sports participation among a national sample of 14,221 high school students. Results show that Hispanic youth in 9<sup>th</sup> – 12<sup>th</sup> grade participate less frequently in sports (52.5%) compared to white students (65.4%) or African American students (55.2%). Opportunities for structured sports activities could help address this disparity and ensure that



Latino youth can participate in school and community sports, engage in more physical activity, and obtain related health benefits.

The purpose of Study 1 was to examine the effects of a community-wide opportunity for physical activity that targeted Latino children through a flyer-based campaign. This involved offering structured opportunities for youth to be physically active through non-competitive soccer. Four research questions were examined:

1. How effective was the campaign in attracting overweight and obese Latino youth?
2. How frequently did participants attend these structured soccer sessions?
3. How much moderate-to-vigorous physical activity did participants accumulate during these structured soccer sessions?
4. How satisfied were youth and parents with these opportunities to be physically active?

## **Method**

### **Context**

As mentioned previously, one of the priority strategies of the physical activity committee of the Latino Health for All Coalition was to create opportunities for residents to play soccer as a way to be physically active (Implement soccer tournaments that will promote physical activity). The coalition's community action board approved this project to create structured soccer sessions, as well as funding for the project in the form of a small grant. These structured opportunities to play soccer were open to all interested youth in Kansas City, Kansas (and surrounding communities).

These structured opportunities to play soccer were promoted through a grassroots campaign, using a paper flyer, available in both English and Spanish. The flyer provided key information about these structured opportunities to play soccer, including time, location, and age

groups. This grassroots campaign involved distribution of the flyer throughout the community. Members of the Latino Health for All Coalition helped disseminate this information by passing out copies of the flyer, posting them on bulletin boards at their agencies, and forwarding this flyer as an e-mail attachment to their contacts. Approximately 450 copies of the flyer were provided to coalition members for distribution. Another 800 flyers were disseminated by a group of local volunteers, door-to-door in the Latino community. These volunteers were bilingual or Spanish speaking community residents. One public school district in Kansas City, Kansas also disseminated these flyers by sending a copy home with each child (along with other school notices). Approximately 1,400 flyers were provided to six local schools. The flyer was also printed in two local Hispanic newspapers that targeted the Latino community in Kansas City, Kansas and Missouri (Dos Mundos and Mi Raza). The English version of the flyer is available in Appendix A.

### **Participants**

Youth between the ages of 6 to 15 were invited to participate. These opportunities were open to both boys and girls. Although the intervention targeted Latino youth, these structured soccer sessions were open to youth of any race or ethnicity. Participation in soccer required the youth to have a parent (or legal guardian) register them. Participants were asked to contribute \$20.00 to participate (which covered liability insurance); if parents were unable to pay, youth were given scholarships to cover part or the entire fee. No participants were excluded due to financial constraints.

### **Setting**

These opportunities for structured soccer were made available on eight consecutive weeks from early June until late July. Sessions one through seven occurred at a public park in

Kansas City, Kansas on a weekday evening. This park was located in Wyandotte County, Kansas. According to the U.S. Census Bureau, Wyandotte County is 26.4% Hispanic/Latino (U.S. Census Bureau, 2010). An open field that was approximately 200 feet by 150 feet was used for each session. The final session occurred indoors at a local community center on a weekday evening. The community center gymnasium was used for the final session. This space was approximately 150 feet by 75 feet.

### **Measurement**

**Participant characteristics.** The first soccer session that a youth participant and his or her parent(s) or legal guardian(s) attended required the completion of a sign-up form. The sign-up form asked parents to provide basic information, including information about the child, the parent(s), and emergency contacts. Parents also received an informed consent statement (approved by the University of Kansas Institutional Review Board), and were asked to participate in the study by providing additional information. Parents who provided informed consent reported the child's height (in feet and inches) and weight (in pounds). A Health o Meter digital scale (Model # HDR743-41) and standard tape measure were available for parents who could not provide their child's height and weight. Parents were also asked how many days their child was physically active for 60 minutes or more during the past seven days; this question came from the Centers for Disease Control and Prevention's 2009 Youth Risk Behavioral Surveillance System (Centers for Disease Control and Prevention, 2010d). Finally, parents who provided informed consent were asked to indicate whether or not their child was of Hispanic or Latino origin; this question came from the 2010 U.S. Census (U.S. Census Bureau, n.d.-a). The informed consent and sign-up form was available English and Spanish; the English version of the

sign-up form is included in Appendix B. The information provided on the sign-up form enabled a characterization of who the grassroots campaign attracted to these structured soccer sessions.

**Participant attendance.** Each week participants checked in before the start of their age group's session. Participants brought their punch card to a study volunteer who punched the card, and marked the participant as present from a list that included the child's first name, last name, and photo. After the session began, a count was conducted to ensure that the number of participants who had checked in matched the number of participants who were actually present on the soccer field. If a discrepancy existed, attendance was taken again to ensure it reflected the participants who were present on the field.

**Physical activity during the session.** During session seven, a convenience sample ( $N = 6$ ) was selected from participants in each age group to obtain a cross-sectional estimate of the accumulation of moderate-to-vigorous physical activity during these structured soccer sessions. Session seven followed the same format as other sessions. After obtaining informed consent from parents (and verbal assent from children), a volunteer measured the participant's height (in feet and inches) and weight (in pounds), using the Centers for Disease Control and Prevention protocol for measuring height and weight accurately at home (Centers for Disease Control and Prevention, 2011c). This enabled a more precise calculation of BMI using the CDC's BMI Calculator for Child and Teen (Centers for Disease Control and Prevention, n.d.). Then, an ActiGraph accelerometer (Model # GT3X) was attached to the participants' hip using a belt clip. Accelerometers were set to record movement counts in 60 second intervals for the entirety of each participant's soccer session. Participants wore the accelerometer from start to end of their age group's session. Video data of session seven were also obtained. The session was recorded using an Insignia - 5.0MP High-Definition Digital Camcorder (Model # NS-DV720P). This

recording allowed accelerometer data to be analyzed by session condition: “drills,” “game,” and “other” conditions.

**Parent and child satisfaction.** Parents received a paper and pencil satisfaction survey at the conclusion of the final soccer session. Parents signed an additional informed consent form before completing the survey (available in English and Spanish). This survey enabled an assessment of child and parent satisfaction with these structured soccer sessions. The survey consisted of four items to assess child satisfaction. These four items were affirmative statements (e.g., “I learned soccer skills”). The child provided his or her level of agreement with each of the statements on a 1 to 5 scale (1 = “a little, 5 = “a lot”) with the assistance of their parent(s). The items assessed: a) child perception of soccer skills learned, b) Confidence in soccer skills, c) Enjoyment of these structured opportunities, and d) Desire to keep playing soccer. If more than one child participated from a family, parents were asked to have their oldest child respond to these items.

The satisfaction survey also consisted of three items to assess parent satisfaction. The first item asked parents to indicate their level of agreement (1 = disagree, 5 = agree) with the statement, “Latino Health for All Youth Soccer was good exercise for my child(ren).” The second item asked how likely they would be to have their child participate in these types of structured soccer sessions in the future (1 = Not likely, 5 = Very likely). The third item asked parents about their overall level of satisfaction with the soccer sessions (1 = dissatisfied, 5 = very satisfied). The satisfaction survey was available to parents in English and Spanish; the English version of the survey is included in Appendix C.

## **Intervention**

This structured youth soccer intervention consisted of soccer sessions (weekly, hour long sessions for youth to receive soccer instruction, perform soccer drills, and play practice games), social reinforcement, tangible reinforcement, and provision of information to parents. The components and elements of the intervention can be seen in Table 2. Sessions began with brief verbal instruction of a key soccer skill (e.g., dribbling, passing, defending) and often included demonstration of the skill. Then, sessions offered the chance for youth participants to practice the skill in a small group (typically three to seven) with a volunteer adult coach. After practicing the skills, youth were divided into teams for practice games; these games typically involved five to ten participants on each team and used a small, non-regulation playing field. Practice games provided continuous play; no score was kept. Participants took frequent breaks (typically three to four within the hour session) for water (they were given a water bottle with the Latino Health for All logo at the first session they attended). Sessions ended with a group huddle and review of skills learned. The program emphasized having fun with the game of soccer, and this was verbally re-iterated during the closing huddle.


Table 2

*Components and Elements of the Structured Soccer Intervention*

Component	Element(s)	Session(s) Provided
Soccer sessions	1. Soccer instruction 2. Soccer drills 3. Practice games	1 – 8
Social reinforcement	1. Adult encouragement 2. Parent recognition	1 – 8
Tangible reinforcement	1. Professional soccer game tickets 2. Medals	8
Information Provision	1. Physical activity resources (provided to parents)	8

The hour-long soccer sessions were divided by age group: 6 to 9 years old, 10 to 12 years old, and 13 to 15 years old. Each age group participated during a separate hour. Group size ranged from 10 to 30 participants. Sessions were facilitated by an experienced soccer instructor – the president of Kansas City, KS Soccer Association. Nine adult volunteers (7 males, 2 females) were certified by Kansas Youth Soccer and assisted the president at each weekly session (Kansas Youth Soccer, 2011). Seven of the nine adult volunteer coaches reported a Hispanic or Latino origin; four of the nine coaches reported previous experience coaching. Four of the coaches were parents to a child participating in the structured soccer sessions. Both the president and the coaches provided informal verbal encouragement throughout each session. Additionally, session four featured a visit from a Kansas City Wizards (professional soccer) player who participated in the session with the youth, providing informal verbal encouragement.

The intervention also included positive reinforcement for youth's participation in the soccer sessions. Each participant received a punch card at the first session he or she attended and was asked to bring the card to each session to be punched. The participant was informed that he or she would receive a free ticket to an upcoming Kansas City Wizards game, contingent upon attending six or more sessions. The punch card is displayed in Figure 1. During the final session, all participants were recognized by having their name called, receiving applause from parents and other participants, and receiving a medal for their participation. Finally, at the last session, parents received a list of additional local opportunities for their child to be involved in structured physical activities, such as youth sports teams. This list was provided in English and Spanish. An English version of these resources is included in Appendix D.

<b>Latino Health for All Youth Soccer</b> <b>Fútbol Juvenil - Salud para Todos los Latinos</b>		
Name/llamo: _____		
<b>1)</b>	<b>2)</b>	<b>3)</b>
<b>4)</b>	<b>5)</b>	<b>6) Free Ticket</b> <b>Entrada Gratuita</b> 

*Figure 1.* Punch card used to reinforce participant attendance.

### **Study Design and Analysis**

This study used an empirical case study design to examine the effects of the structured soccer sessions. A descriptive analysis of participant demographics involved calculating basic descriptive information including: a) gender, b) age, c) ethnic origin, d) Body Mass Index, e) number of days in which the participant met the daily physical activity recommendation, and f) previous soccer experience. Body Mass Index was calculated using the Centers for Disease Control and Prevention’s BMI Calculator for Child and Teen (Centers for Disease Control and Prevention, n.d.).

Attendance records were analyzed by calculating the average number of sessions attended for each participant. A two sample t-test was conducted to examine attendance rates by gender. A single factor Analysis of Variance was conducted to examine attendance rates by BMI category (“healthy weight,” “overweight,” and “obese”).

After session seven, data from accelerometers were downloaded and exported to Microsoft Excel for analysis. Metabolic equivalents (METs) represent standard units of energy expenditure that enable a comparison of effort across diverse types of physical activities. One MET represents energy expenditure at rest (Welk, 2002). A regression equation cited by



Freedson, Pober, and Janz (2005) was used to determine age-adjusted, movement count cut points that denote moderate to vigorous physical activity levels. The equation used to calculate accelerometer cut points (in counts per minute) was:  $\text{METs} = 2.757 + (0.0015 * \text{counts per minute}) - (0.08957 * \text{age (yr)}) - (0.000038 * \text{counts per minute} * \text{age (yr)})$ . Accelerometer cut points were calculated for each participant using a formula in Microsoft Excel.

## **Results**

The results of the study are organized by research question.

### **Question 1: How effective was the campaign at attracting overweight and obese Latino youth?**

Eighty-two youth participated in one or more sessions of soccer. Parents of 74 of the 82 youth (90.2%) provided informed consent at their first soccer session. These 74 youth came from 53 households.

Fifty-two boys (70.3%) and 22 girls (29.7%) participated. Thirty-nine participants (52.7%) were 6 to 9 years old at their first session. Twenty-two participants (29.7%) were 10 to 12 year old and 8 participants (10.8%) were 13 to 15 year old at their first session. Age was not reported or missing for 2 of the 74 participants. Three participants were either under the age of 6 or older than 15 at their first session. These youth were allowed to participate with the permission of their parents; they participated with the age group that they were closest to in age.

Although these soccer sessions were open to all youth, 90.5% of participants reported a Hispanic or Latino origin. “Mexican, Mexican American, or Chicano” represented the most common Hispanic/Latino origin reported (79.7%). These soccer sessions also targeted youth at risk for chronic conditions related to physical inactivity. Among the 59 parents who reported a height, weight, and birthday for their child, 18 (24.3%) were obese and 14 (18.9%) were

overweight at their first session attended. The majority of parents (71.6%) reported that their child was less physically active than recommended (i.e., less than 60 minutes per day, 7 times per week). Nearly half of the participants (48.6%) had never played a season of organized soccer before. Table 3 provides demographic information about the participants who attended at least one of the eight soccer sessions.

Table 3

*Demographics of Participants from the Structured Soccer Sessions (N = 74)*

Demographic	Frequency	Percent	Cumulative percent (For ratio data)
<b>Gender</b>			
Male	52	70.3	
Female	22	29.7	
<b>Age at Registration</b>			
Under 6 years old	2	2.7	2.7
6 to 9 years old	39	52.7	55.4
10 to 12 years old	22	29.7	85.1
13 to 15 years old	8	10.8	95.9
Over 15 years old	1	1.4	97.3
Not reported or missing	2	2.7	100.0
<b>Origin</b>			
Mexican, Mexican American, Chicano	59	79.7	
Another Hispanic, Latino, or Spanish origin	7	9.5	
Not of Hispanic, Latino or Spanish origin	6	8.1	
Multiple Hispanic, Latino or Spanish origin	1	1.4	
Not reported or missing	1	1.4	
<b>BMI category</b>			
Obese (BMI: 19.0 – 36.1)	18	24.3	
Overweight (BMI: 17.3 – 25.7)	14	18.9	
Healthy weight (BMI: 14.2 – 21.5)	20	27.0	
Underweight (BMI: 11.2 – 13.8)	7	9.5	
Not reported, missing, or undetermined <sup>a</sup>	15	20.3	
<b>Reported number of days meeting PA requirement</b>			

0 days	10	13.5	13.5
1 day	8	10.8	24.3
2 days	5	6.8	31.1
3 days	10	13.5	44.6
4 days	6	8.1	52.7
5 days	12	16.2	68.9
6 days	2	2.7	71.6
7 days	17	23.0	94.6
Not reported or missing	4	5.4	100.0
Previous seasons of soccer <sup>b</sup>			
0 season	36	48.6	48.6
1 season	9	12.2	60.8
2 seasons	11	14.9	75.5
3 seasons	5	6.8	82.5
4 seasons	1	1.4	83.9
5 seasons	2	2.7	86.6
6 seasons	2	2.7	89.3
7 seasons	1	1.4	90.7
8 seasons	1	1.4	92.1
Not reported or missing	6	8.1	100.2

*Note.* Percent and cumulative percent may not total 100 due to rounding.

<sup>a</sup> “Undetermined” BMI categories were those in which the parent reported height and weight of the child did not fit the Centers for Disease Control and Prevention growth curve.

<sup>b</sup> If parents reported their child’s prior seasons of soccer played in years, 1 year = 1 season.

## **Question 2: How frequently did participants attend these structured soccer sessions?**

On average, participants attended 4.2 of the 8 sessions (SD = 2.0). Twenty-two participants (29.7%) attended 6 or more sessions – the required number of sessions to receive a free ticket to the Wizards game. Seven of the 74 child participants (9.5%) attended only 1 session. Boys (N = 52) attended an average of 4.3 sessions, while girls (N = 22) attended an average of 3.9 sessions. A two-sample t-test showed no significant difference in the average number of sessions attended by boys vs. girls ( $t(40)=2.08, p=0.48$ ).

Attendance was also examined by body mass index (BMI) category. Among parents who reported the height, weight, and birthday of their child or adolescent (N = 52), 20 (38.5%) were

of a “healthy weight” (BMI = 14.2 – 21.5) according to the CDC’s BMI Calculator for Child and Teen, 14 (26.9%) were “overweight” (BMI =17.3 – 25.7), and 18 (34.6%) were “obese” (BMI = 19.0 – 36.1) [Underweight participants were excluded from this analysis]. Healthy weight children attended an average of 4.3 sessions (SD = 2.2), overweight children attended an average of 4.0 sessions (SD = 1.9), and obese children attended an average of 3.9 sessions (SD = 1.9). A single factor analysis of variance showed no significant difference in the average number of sessions attended among participants in the three BMI categories [ $F(2, 49) = 0.16, p = 0.85$ ].

**Question 3: How much moderate-to-vigorous physical activity did participants accumulate during these structured soccer opportunities?**

A convenience sample of twelve participants was selected from the two larger age groups to obtain a cross-sectional estimate of moderate-to-vigorous physical activity levels accumulated during a typical session (session seven). Six of the 16 participants present at session 7 were selected from the 6 to 9 year old age group (37.5%), and six of the 21 (28.6%) came from the 10 to 12 year old age group. No participants were selected from the 13 to 15 year old age group because of rain during their allotted hour in session seven. Among both groups (N = 12), five participants had BMI’s in the “healthy weight” range, 2 were in the “overweight” range, and 5 were in the “obese” range. Table 4 provides detailed demographics of participants’ gender and body mass index.

Table 4

*Demographics of Participants Selected to Assess the Intensity of Physical Activity During Soccer Session Seven (N = 12)*

	5 to 9 Years Old	10 to 12 Years Old	Total
Gender			
Male	4	3	7
Female	2	3	5

## Body Mass Index

“Healthy” (BMI = 16.0 – 18.9)	1	4	5
“Overweight” (BMI = 17.3 – 21.8)	1	1	2
“Obese” (BMI = 19.0 – 26.5)	4	1	5

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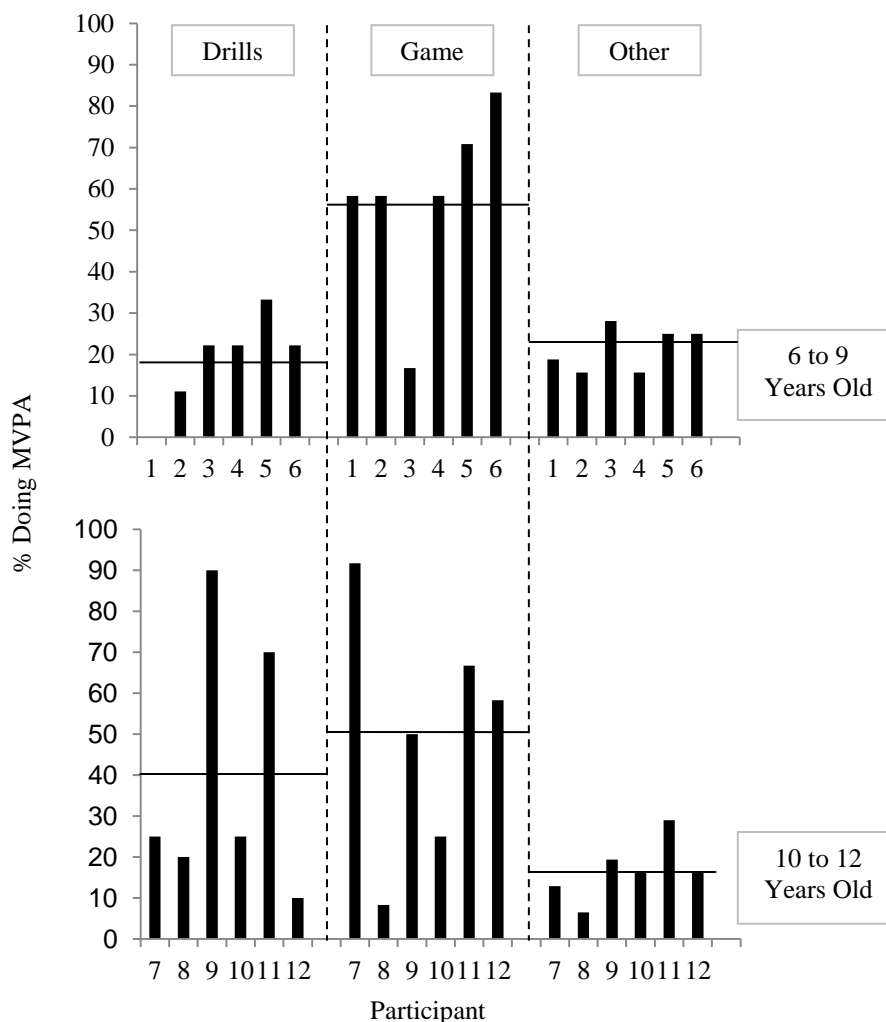
The video from the session was used to determine the duration of three conditions within the session: 1) drills, 2) practice games, and 3) other (i.e., instruction, water breaks, and the huddle at the end of the session). The 6 to 9 year old group’s session lasted 65 minutes; drills took approximately 9 minutes, the practice game lasted approximately 24 minutes, and other conditions took approximately 32 minutes. The 10-12 year old age group spent more time with drills (approximately 20 minutes), less time with games (approximately 12 minutes) and more time with instructions, breaks and the huddle (approximately 31 minutes). Participant accelerometer data enabled a determination of moderate (4 METs) to vigorous (7 METs) physical activity (MVPA) overall, and within specific conditions. Participants in the 6 to 9 year old group accumulated an average of 22.2 minutes of MVPA across the entire session. The 10 to 12 year old age group accumulated an average of 18.8 minutes of MVPA across the entire session. Across both groups, the practice game condition provided the highest percentage of time in MVPA (57.5% and 50.0%), followed by the drill condition (17.8% and 40.0%); the lowest percent of time spent in MVPA was the “other” condition (21.3% and 16.8%). Table 5 provides data by condition for both age groups.

Table 5

*Minutes of Moderate-to-Vigorous Physical Activity by Condition During Soccer Session Seven*

Session Phase	5 To 9 Years Old			10 to 12 Years Old		
	Minutes in Session Phase	Ave. Minutes of MVPA in Phase (N = 6)	Percent of Ave. Minutes of MVPA in Phase	Minutes in Session Phase	Ave. Minutes of MVPA in Phase (N = 6)	Percent of Ave. Minutes of MVPA in Phase
Drills	9	1.6	17.8	20	8.0	40.0
Game	24	13.8	57.5	12	6.0	50.0
Other (Instruction, Breaks, Huddle)	32	6.8	21.3	31	5.2	16.8
Total	65	22.2		63	18.8	

The accumulation of moderate-to-vigorous physical activity within each condition (drills, game, other) varied for individual children. For the 5 to 9 year old group, variation among individual children was limited. For the 10 to 12 year old group, variation was greater. For example, in the 10 to 12 year old age group, participant 8 was physically active at moderate-to-vigorous levels for 8.3% (1 minute) of the game condition, while participant 7 was active for 91.7% (11 minutes) of the game condition. Figure 2 shows percent of soccer condition spent doing moderate-to-vigorous physical activity (MVPA) by participant.



*Figure 2.* Percent of soccer condition spent doing moderate-to-vigorous physical activity (MVPA) by participants aged 5 to 9 ( $N = 6$ ) and 10 to 12 years old ( $N = 6$ ).

A Friedman test was conducted to evaluate differences in medians among percent of soccer session condition (drills, game, or other) spent doing moderate-to-vigorous physical activity. The test was significant  $\chi^2(2, N = 12) = 6.68, P < 0.5$ . Post hoc comparisons were conducted using a Wilcoxon Signed Ranks test. Results indicate the median percent of soccer session spent in the “game” condition was significantly greater than in the “other” condition ( $p < .05$ ). The “game” condition did not show significant differences when compared to the “drill” condition ( $p = .062$ ), nor the “drill” condition compared to “other” condition ( $p = .136$ ).

**Question 4: How satisfied were youth and parents with these structured opportunities to be physically active?**

After the last session of soccer, parents received a satisfaction survey. Parents from 24 families completed the survey. If more than one child per family participated in the soccer sessions, parents were instructed to have only their oldest child answer the items related to child satisfaction. Children from 33 families attended the eighth session and a satisfaction survey was completed by a parent from 26 of the 33 families present (78.8%).

Both children and parents expressed high levels of satisfaction with the structured soccer sessions. On average, children rated the four affirmative statements (e.g., “I had fun at soccer”) with a high level of agreement. Child ratings across the four affirmative statements were between 4.54 – 4.85 (1 = “a little,” 5 = “a lot”). Parents also expressed high levels of satisfaction. On average, parents ratings across the three items were between 4.89 – 4.96. Details on child and parent ratings can be seen in Table 6.

Table 6

*Structured Soccer Session Satisfaction Ratings*

Child survey item	Frequency				Mean	
	A little			A lot		
1. I learned soccer skills	1	0	3	2	20	4.54
2. I feel more confident in my soccer skills	1	0	1	6	18	4.54
3. I had fun at soccer	1	0	0	3	22	4.73
4. I want to keep playing soccer	1	0	0	0	25	4.85
Parent survey item						
5. I felt Latino Health for All Youth Soccer was good exercise for my child(ren)	(Disagree)				(Agree)	
	0	0	0	1	25	4.96
6. How likely are you to sign your child up for Latino Health for All Youth Soccer next year?	(Not Likely)				(Very Likely)	
	0	0	1	1	24	4.89
7. Overall, how satisfied are you with Latino Health for All Youth Soccer?	(Dissatisfied)				(Very Satisfied)	
	0	0	0	1	25	4.96



## Discussion

Consistent with community-determined priority strategy set by the Latino Health for All Coalition, these soccer sessions offered structured opportunities for youth to be physically active. They targeted youth from the Latino community – and succeeded in attracting over 74 youth – 90.6% of whom reported a Hispanic or Latino origin. The soccer sessions also succeeded by engaging children and youth who were overweight or obese. The 18 participants who were reported as obese (24.3%) was a higher proportion of obese youth than found in the general population. According to the 2007-2008 National Health and Nutrition Examination Survey (NHANES), 16.9% of children (between the ages of 2 to 19) in a national sample were obese (Centers for Disease Control and Prevention, 2010c).

These soccer sessions provided an opportunity for youth with different levels of soccer experience to be physically active. Numerous studies highlight the competitive nature of youth sports, and some hypothesize that physically inactive youth are less likely to participate in these types of activities. Nearly half of these children and youth had never participated in a season of soccer. On average, participants attended about half of the weekly soccer sessions. Attendance rates did not differ by gender or BMI category (obese, overweight, or healthy weight). This suggests that these sessions provided an opportunity that was inviting for a diverse group of youth, including those of unhealthy weight. The data from satisfaction surveys support this – satisfaction ratings among both children and parents were high.

This study has a few limitations. This empirical case study was “discovery oriented.” It examined the effects of the soccer sessions with a small number of participants for a relatively short period. It is uncertain if this program would have the same effects in a different geographic place, or if it targeted a different ethnic or racial group. Because of the high volume of

participants (especially in the 6 to 9 year old group) measurements related to BMI were provided via parent report. When parents could not report their child's height and weight, they were provided a scale and standard tape measure. Future studies that involve this intervention should obtain more accurate measures of BMI using more precise instrumentation to measure body composition, such as Bioelectrical Impedance Analysis. Because this study took place in a naturalistic setting (a local park) confounding variables, such as adverse weather (including heat and rain), and the availability of transportation may have influenced participation and attendance. Other important questions, such as contribution to change in fitness levels or body composition, were not examined in this study.

Despite the limitations, the results of this study offer promise for the promotion of physical activity among Hispanic/Latino children and youth. The intervention was not costly to facilitate – parents contributed \$20.00 per child to participate (or as much as they were able to contribute) to cover liability insurance for the Kansas City, KS Soccer Association. Certification for volunteer adult coaches (which were covered by a small grant from the Latino Health for All Coalition) cost \$35.00 per coach. The final session (held indoors at a community center to ensure it could happen in the event of adverse weather) cost \$80.00. The other costs incurred in these sessions (e.g., costs to copy the flyer, water bottles, medals) were minimal and were not directly incurred for facilitating the sessions. The implementation of this intervention in other settings would require a modest amount of space. Session 8 involved drills and games using a space of approximately 150 feet by 75 feet for a group of 28 participants.

Although the experimenter (a doctoral candidate) organized these sessions, implementing this program would not require extensive training or education. Ten consecutive sessions of structured soccer were offered again – indoors (at the same location session 8 was held in the

present study), the following winter/spring (January – March). A local resident, a bilingual Latina woman, was trained to organize these soccer sessions. She led the promotion of the soccer sessions (using a similar grassroots campaign, involving a flyer). The registration form revealed participant demographic data, similar to the first set of structured soccer sessions. Eighty-three participants attended at least one session of the replication –61 males (73.5%) and 22 females (26.5%); similar to the initial soccer sessions (70.3% male). The average age was 9.3 years during the summer sessions compared to 8.3 years of age during the initial winter/spring sessions. Many of these participants who attended the winter/spring sessions had not attended the summer sessions.

Participants in the replication soccer sessions received an identical satisfaction survey. Participants from thirteen families completed the survey on the last week of indoor soccer. Scores for the four child items were lower, but comparable. Across the 4 items children rated their satisfaction as 4.41 (vs. 4.67 for the summer sessions). Parents rated their satisfaction across the 3 parent items as 4.88 (vs. 4.94 for the summer sessions). Overall, the winter/spring sessions show similar participant demographics and satisfaction survey data. This suggests that a community facilitator can organize these soccer sessions with minimal training.

Local people – parents and other adults in the community – could also create structured opportunities for soccer. Results show that the game condition offered the highest proportion of moderate to vigorous physical activity during the initial summer sessions (50.0% to 57.5%). Adults with an interest in soccer could facilitate practice games with children in parks or other places in the community. Future efforts to promote physical activity among youth might train adults to create such occasions in public places and examine the types of results that community members obtain.

The partnership between the Kansas City, KS Soccer Association and the experimenter (and the Latino Health for All Coalition) offered opportunities to provide health education and health promotion. For example, many parents would watch these structured soccer sessions, rather than dropping their child off at the field. This offered opportunities to educate and promote physical activity with adults. During one of the sessions, all parents were provided with a pedometer and the American College of Sports Medicines brochure, “Selecting and effectively using a pedometer” (American College of Sports Medicine, 2005). The brochure was adapted and translated into Spanish. Other school and community youth sports programming could offer similar opportunities for health promotion and education among parents.

These structured opportunities for children and youth to engage in soccer provided a way to attract Latino children and youth to participate in group physical activity. Through collaboration, communities can improve opportunities for physical activities to youth of different fitness levels.

### **Study 2: Experimental Study of a Family Intervention to Promote Physical Activity Among Obese Children**

There are many environmental variables that affect the physical activity level of children, including parental support for physical activity. Although it is hard to determine the contribution of the family’s effect on physical activity, engaging parents is seen as a promising strategy to increase youth physical activity (O’Connor, Jago, & Baranowski, 2009). Beets, Cardinal, and Alderman (2010) cite several direct forms of involvement including: a) involvement (doing the activity, watching them), b) encouraging their child during physical activity, and c) instrumental support (e.g., providing equipment, transportation). There is evidence that family support contributes to physical activity (Saelens & Kerr, 2008). A study conducted by Cleland et al.

(2011), involving a sample of 440 Australian children between the ages of 5 and 12, found that objectively measured physical activity was affected by parental and family physical support for physical activity. Specifically, the child participant's physical activity level was affected by family participation in physical activity, praise for participating in physical activity, and other support including transportation, money and equipment for physical activity. The effect of parental support on physical activity is complex; many variables such as child age may determine the magnitude of effect parents can have on their child's physical activity level. For example, evidence suggests that for older adolescents, aspects of the built environment (e.g., access to facilities) may contribute more to physical activity levels than for younger children (Dunton, Kaplan, Wolch, Jerrett, & Reynolds, 2009).

Evidence for the effectiveness of home-based interventions to promote physical activity is emerging and not yet considered a "best practice." However, home-based interventions, such as home visiting, suggest the promise of this strategy for promotion of physical activity among young children (Wen et al., 2007). Findings from home-based interventions to promote physical activity among children suggest that they can be implemented effectively and are also satisfactory to parents (LaRowe, Wubben, Cronin, Vannatter, & Adams, 2007; Teufel et al., 1999). Evidence also suggests that some home-based interventions can yield as much of an increase in physical activity as community-based interventions (Ransdell et al., 2003).

One frequent component of home-based programs is the delivery of health information. Many parents report limited knowledge about physical activity. McGarvey et al. (2006) conducted focus groups with 24 mothers (and 1 father) of varied ethnicities, finding that they held a limited awareness of the relationship between physical activity and its effects on health. Atkinson, Billing, Desmond, Gold, and Tournas-Hardt (2007) used a telephone survey (N =

146) and focus groups to assess needs for nutrition and physical activity education among low-income women. Results showed that women expressed a lack of knowledge about physical activity guidelines. Evaluations of home-based programs that target both adolescents and adults have found increases in physical activity knowledge and awareness of the importance of physical activity (Kicklighter et al., 2007; Patrick et al., 2006; Salmon, Booth, Phongsavan, Murphy, & Timperio, 2007). However, knowledge is only one of the key components needed to affect health behavior with home-based interventions. Other key variables such as decreasing barriers to physical activity are not often addressed; yet, increases in actual activity are not assured with knowledge provision alone (Anand et al., 2007; Harvey-Berino & Rourke, 2003; Reilly et al., 2006). Delivery of health information would represent only one of the key components to an effective, home-based physical activity intervention.

Goal setting is a component of physical activity interventions that have worked well with adult populations. In a review of intervention studies targeting adults, Shilts, Horowitz, and Townsend (2004) found that in 13 of 23 studies used goal setting as an intervention component to increase physical activity and 8 of these 13 studies resulted in increased levels of physical activity. In adult intervention studies that have used pedometers, setting a step goal has been an important part of the intervention (Bravata et al., 2007). Although Shilts et al. (2004) cite the lack of evidence for the effectiveness of goal setting with children, the practice and conceptual literature offers some guidelines for using goal setting with children. Goals should be behavioral (e.g., walking) and focus on something achievable (e.g., walk for 30 minutes), rather than on an outcome (e.g., lose 5 pounds) (Ward-Begnoche & Speaker, 2006). Goals for children should also focus on the rewards of achieving it; this could be a focus on an intangible state (e.g., the

feelings associated with physical activity), or it could be a tangible reward (Martinek & Hellison, 1998).

The provision of feedback is another important component in physical activity interventions. Feedback has been used with interventions aimed at increasing physical activity among adults. In one such intervention, 194 sedentary adults received a report that provided details about their physical activity after an initial baseline assessment to determine progress made (Marcus et al., 1998). In other studies, patients set step goals and wore pedometers, enabling them to obtain feedback on the goals (i.e., steps taken) that they set (de Blok et al., 2006). Programs that involve assuring consequences for goals met also offer evidence as a promising intervention strategy. Behavioral contracting (also known as health contracts) have been useful as part of adult interventions that promote physical activity (Gerber, Bloom, & Ross, 2010; Haber & Rhodes, 2004). For children and adolescents, contingencies have been shown to increase levels of physical activity. Roemmich, Gurgol, and Epstein (2004) demonstrated this with 8 to 12 year old youth (BMI < 90<sup>th</sup> percentile) who visited a university setting. Intervention participants (N = 11) were given access to television contingent upon physical activity (control participants were given non-contingent access). Results showed a 24% increase in physical activity for intervention participants (compared to decreases in physical activity for the control group). A similar study was replicated by Goldfield et al. (2006) with a small group of youth in Ontario, Canada. Youth age 8 to 12 (N = 16) who were obese (BMI ≥ 85<sup>th</sup> percentile) were given tokens for physical activity that could be exchanged for use of the television, VCR, or DVD player. While physical activity increased over the course of the study for both groups, it increased more for the intervention group (increase of 9.4 minutes per day) than for the control group (increase of 0.3 minutes per day) who were given non-contingent access to electronic

media. Finally, Taggart, Taggart, and Siedentop (1986) conducted a home-based intervention in which 12 participants, aged 9 to 12 years old, who had low levels of fitness, began a program that involved weekly contingency contracts in which child participants could earn points for certain types of physical activities. Points could be exchanged for parent-determined reinforcers. Results showed increases in activity (an average of 512 minutes spent active during baseline, compared to 764 minutes during the intervention), as well as increased scores on the post-intervention fitness test.

This review of the evidence base suggests that effective home-based programs involve multiple components, including goal setting, feedback, and contingency contracting. The home setting offers advantage for implementing these intervention components, especially with hard-to-reach populations who are at risk for the health consequences of physical inactivity. In the Hispanic/Latino community, one approach for delivering tailored interventions has been through lay health workers. A lay health worker is “an individual who is indigenous to his/her community and consents to be a link between community members and the service delivery system” (Eng, Parker, & Harlan, 1997). Among Hispanic and Latino populations, community health workers have delivered preventive health services in the home (via telephone) to address preventative screenings (Hunter et al., 2004), in community health clinics to address tobacco cessation (Martinez-Bristow, Sias, Urquidi, & Feng, 2006), and via telephone to encourage healthy nutrition and physical activity (Staten et al., 2004). Evidence for the effectiveness of the Promotores de Salud approach (a lay health worker approach) is promising, but preliminary. In a study conducted by Medina, Balcazar, Hollen, Nkhoma, and Soto Mas (2007), 113 Hispanic adults from Texas completed either a 6-week classroom based or home-based curriculum aimed



at increasing behavior related to cardiovascular disease prevention. Results show that both groups reported increases in physical activity on a paper-and-pencil survey.

Study 2 of this dissertation examines the effects of a family-based intervention to promote physical activity among Latino youth who are obese. This intervention research study involved five Latino youth (3 boys and 2 girls) from separate families who were obese. This study has four aims:

1. To describe environmental variables related to physical activity in home and neighborhood settings, for these five youth, using three assessments (behavioral interviews, the Physical Activity and Media Inventory, and the Physical Activity Resource Assessment)
2. To answer five key questions related to implementation of this intervention:
  - a. What types of physical activity goals did parents set for their child?
  - b. What were the characteristics and outcomes of parent-determined behavioral contracts to promote physical activity by their child?
  - c. How accurately did parents reinforce 10 minute bouts of physical activity by their child?
  - d. What was the intervention's effect on parental knowledge of physical activity guidelines for children?
  - e. What was the (child) participant's compliance level with wearing the accelerometer?
3. To examine the effects of the intervention on daily levels of moderate-to-vigorous physical activity among child participants
4. To determine satisfaction among children and parents who participate in the intervention

## **Method**

This study examined the effects of a multi-component intervention that trained parents of obese Latino children to set physical activity goals for their children, develop weekly behavioral contracts for their children to engage in physical activity, and reinforce small bouts of physical activity. The intervention also involved providing feedback to parents in the form of a “physical activity report card.” The intervention was conducted in the participants’ homes.

### **Participants and Setting**

A flyer that described the study was used to recruit participants (see Appendix E). Parents with a child who participated in at least one of the structured soccer sessions (Study 1) received the flyer via mail. Additional participants were recruited through an elementary school and a church in a Latino neighborhood of Kansas City, Kansas. Criteria for participation in this study were:

1. The parent must self-identify as Hispanic/Latino
2. The parent and child must be able to speak conversational English
3. The parent and child must reside in Kansas City, Kansas
4. The child participant must have a body mass index (BMI) in the obese range
5. The child’s parents must report the child’s health as good enough to engage in daily moderate-to-vigorous physical activity
6. The parent and child must not planning to move during the study
7. The parent must express willingness to participate in all components of the intervention

Fifteen parents expressed interest in the present study and were screened for eligibility. The targeted size for Study 2 was three to six participants. Seven of the 15 children were

ineligible because their parent did not speak conversational English (Criteria 2). One child was ineligible because he did not have a BMI in the obese range (Criteria 4).

Two additional participants were eliminated from consideration because of their potentially high levels of physical activity. Burdette, Whitaker, and Daniels (2004) validated a question that estimates child physical activity via parental report of outdoor play time. The question reads, “How much time would you say your child spends playing outdoors on a typical weekend day?” Parents report outdoor play time in hours and minutes. The two parents who reported the highest levels of outdoor play - 2:30 minutes on an average weekend (non-school) day were eliminated from consideration. This narrowed the participants to the target study size (3 to 6 participants). The parents of all 10 children who expressed interest in the study, but were not selected, received all the intervention materials after the study (in English and Spanish).

The five children who remained were selected for the study. Three of the children were boys (“Raul,” “Julio,” and “Carlos”) and two were girls (“Maria” and “Jimena”). All participants were in their 5<sup>th</sup> to 7<sup>th</sup> year of age at the initial home visit. Two of the children (Raul and Julio) had participated in the structured soccer sessions (described in Study 1).

The study took place during the summer recess from school (early June to late August). It began with a home visit in which the experimenter (the author of this dissertation) explained the study and obtained signed informed consent from the parent and verbal assent from the child. All study procedures had been formally approved by the University of Kansas Human Subjects Committee. Parents completed a 25-item demographic questionnaire that described the child, the parent(s), and the household. The demographic questionnaire was read out loud to the parent and she or he provided the experimenter with verbal responses. Two questions related to educational level (questions 7 and 9) came from the Behavior Risk Factor Surveillance Survey (Centers for

Disease Control and Prevention, 2009). A question on marital status (question 8) and a question on the number of adults living in the home (question 15) were adapted from a demographic categories used by Melnyk et al. (2007). A question on language use in the home (question 10) was adapted from a Hispanic acculturation measure (Marin, Sabogal, Vanoss Marin, Otero-Sabogal, & Perez-Stable, 1987). Finally, questions on income for the primary caregiver and spouse or partner (question 17) and any other adults living in the home (question 18) were adapted from income categories used in previous studies (Ransdell, Robertson, Ornes, & Moyer-Mileur, 2004; Ransdell et al., 2003). The demographic questionnaire is included in Appendix F.

Three parents reported an origin of Mexican descent; two of the parents reported an origin of Ecuadorian decent. All children had a body mass index (BMI) in the obese range (at the 97<sup>th</sup> percentile or above). BMI calculations for children require: birth date, the date of measurement, gender, height (in feet and inches to the nearest 1/8 inch), and weight (in pounds and fractions of a pound to the nearest 1/4 of a pound). Parents reported their child's birthday during the screening; height and weight was measured during the first (baseline) visit using a Health o Meter digital scale (Model # HDR743-41) and standard tape measure. The Centers for Disease Control and Prevention (CDC) protocol for measuring a child's height and weight accurately at home was followed by the experimenter for these measurements (Centers for Disease Control and Prevention, 2011a). Body Mass Index (BMI) was calculated using the Centers for Disease Control and Prevention's BMI Calculator for Child and Teen (Centers for Disease Control and Prevention, n.d.).

Four of the primary caregivers had some college; one reported his educational as "Grades 1 through 8 (Elementary)." All child participants received free or reduced lunch during the previous school year. The parents' Body Mass Index was calculated (Centers for Disease Control

and Prevention, 2011b) and self-reported physical activity was obtained using “Section 19: Physical Activity” of the Behavioral Risk Factor Surveillance System Questionnaire (Centers for Disease Control and Prevention, 2009). Results showed that four of five parents were either overweight or obese (1 parent declined to provide her height and weight), despite the fact that they all reported meeting the physical activity guidelines for adults (U.S. Department of Health and Human Services, 2008). Table 7 displays participant demographics of each child and primary caregiver.

Table 7

*Participant Demographics of Child, Primary Caregiver, and Household*

	Participant				
	Raul’s family	Maria’s family	Julio’s family	Carlos’ family	Jimena’s family
Child demographics					
Gender	Male	Female	Male	Male	Female
Age at baseline visit in years and whole months	5 Years, 6 months	6 Years, 6 months	7 Years, 2 months	6 Years, 6 months	7 Years, 9 months
Ethnicity	Ecuadorian	Mexican	Mexican	Ecuadorian	Mexican
BMI Percentile (BMI)	Above the 99th percentile (22.9)	At the 98th percentile (24.1)	Above the 99th percentile (27.9)	Above the 99th percentile (26.2) <sup>a</sup>	At the 97th percentile (22.0)
Parent demographics					
Primary caregiver	Mother	Mother	Mother	Mother	Father <sup>b</sup>
Primary caregiver’s highest educational level	Some college or technical school	Some college or technical school	Some college or technical school	Some college or technical school	Elementary school
Primary caregiver’s BMI	Obese (34.5)	Obese (35.5)	Refused	Overweight (28.1)	Overweight (26.1)
Household demographics					
Participant receiving free or reduced lunch	Yes	Yes	Yes	Yes	Yes
Household income	\$50,000-\$74,999	Less than \$10,000	\$10,000-\$34,999	\$35,000-\$49,999	\$10,000-\$34,000
Adults living in home	2	2	1	2	2
Total children in home	2	3	3	2	3

<sup>a</sup>Height was adjusted from 49.5 inches to 51 inches to fit the Centers for Disease Control and Prevention growth curve.

<sup>b</sup>Jimena’s father spoke English, her mother did not. Both parents identified as “primary caregivers.”

**Measurement for Aim 1: To describe environmental variables related to physical activity in home and neighborhood settings, for these five youth, using three assessments**

Aim 1 involved three measurement approaches: conducting behavioral interviews, having parents complete a home inventory called the Physical Activity and Media Inventory (Sirard, Nelson, Pereira, & Lytle, 2008), and (the experimenter) completing the Physical Activity Resource Assessment (Lee, Booth, Reese-Smith, Regan, & Howard, 2005). Behavioral interviews were conducted with parents during the intervention visit. These interviews were informal; parents provided information about their child's physically activity and inactive behaviors. The experimenter asked these questions throughout the intervention visit; hence, the interview was structured, but conversational in tone. Behavioral interview questions were:

1. How would you describe your child's level of physical activity?
2. At what times have you noticed your child being most physically active?
3. Where has your child been most physically active?
4. Do you have any specific family practices that promote physical activity?
5. What have you done to encourage physical activity?
6. What barriers have you faced in helping your child become more physically active?

All visits were audio recorded using an Olympus Digital Voice Recorder (Model # WS-100). Audio recordings enabled a review of the behavioral interviews and an audio record of each home visit.

The Physical Activity and Media Inventory (PAMI) was used to assess participants' home environments related to physical activity (Sirard et al., 2008). This measure requires that participants to walk through each room or space of their house (including the front porch, garage, and back yard) and document the presence of items related to physical activity and electronic

media. Participants document 50 physical activity items, across 6 categories: sports equipment (N = 14), fitness equipment (N = 6), transportation equipment (N = 5), athletic footwear (N = 5), water sports [equipment] (N = 5), and outdoor / yard equipment (N = 15). Five types of working media equipment were also documented: television, VCR/DVD player, digital video recorder/TiVO, video game system, and computer.

After documenting the presence of physical activity and media items, participants rate the accessibility of each item as: 1) “Put away and difficult to get to,” 2) “Put away and easy to get to,” 3) “In plain view and difficult to get to,” or 4) “In plain view and easy to get to” (Sirard et al., 2008, para. 14). The quantity of each item related to physical activity is multiplied by the accessibility ratings (least accessible = 1, most accessible = 4) to obtain a score for each item. A Physical activity Availability and Accessibility Summary Score (PAASS) and Media Availability and Accessibility Summary Score (MAASS) were then determined by summing each item’s product (quantity \* accessibility). A ratio of PAASS to MAASS was also calculated; this enabled an overall score of homes that are “more conducive for being physically active and less sedentary” (Sirard, et al., 2008, para. 20).

Sirard et al. (2008) validated this instrument among a group of 31 adult participants. The majority of these participants had a college-level education (65%) and were Caucasian (52%). To test for reliability, a second observer conducted a simultaneous, independent assessment with each of the 31 adults. For physical activity items, assessments had high correlations ( $r = .67 - .98$ ); for media items, correlations ranged from  $.79 - .96$ . Test-retest reliability over a one week period was also high for physical activity items ( $ICC = .76 - .99$ ) as well as media items ( $ICC = .72 - .96$ ).

Participants in the present study were provided with the Physical Activity and Media Inventory instrument after the intervention began. The experimenter verbally explained the instrument to the parent and answered any questions that she or he had. Parents were given the option of conducting the assessment with the experimenter; however, all parents declined the opportunity. After the parent completed the assessment, the experimenter reviewed it for completeness and asked if the parent had any questions; none of the parents asked questions after completing the PAMI or expressed any concerns.

The Physical Activity Resource Assessment (PARA) was used to assess resources for physical activity in the broader environment around the family's home. Lee, Booth, Reese-Smith, Regan and Howard developed the PARA. It enables the assessment of eight types of neighborhood resources related to physical activity: 1) fitness clubs, 2) parks, 3) sport facilities, 4) trails, 5) community centers, 6) churches, 7) schools, and 8) a combination of these resources. The PARA captures 25 features of each physical activity resource (e.g., the presence of bike racks, play equipment and trails). Assessors rate each feature on a 0 to 3 rating scale (0 = not present, 1 = poor, 2 = mediocre, 3 = good). The instrument also captures the quality of 12 amenities (e.g., bathrooms) and 12 incivilities (e.g., graffiti, litter) on the same 0 to 3 scale. In the Lee et al. (2005) study, the PARA showed fair levels of reliability ( $r_s > .77$ ) between two independent observers trained to use the instrument.

Lee et al. (2005) examined physical activity resources within a half mile of 17 housing development neighborhoods (i.e., public housing apartment complexes, buildings with multiple families, public housing developments) in Kansas City, Missouri. The PARA was conducted in three steps: a) internet searches for physical activity resources using an established protocol (Estabrooks, Lee, & Gyurcsik, 2003), b) windshield tours (i.e., driving through the



neighborhood) conducted to confirm the presence of physical activity resources and to ensure that all resources were identified, and c) identified physical activity resources were assessed using a 49-item PARA. In the present study, the PARA was used to assess resources within a half mile radius of each participant's home, following the Lee et al. (2005) procedure.

After the experimenter identified and confirmed all physical activity resources in each participant's neighborhood, he developed lists of resources for each neighborhood. These lists were used to construct a measure that assessed the frequency of physical activity resource use. An example excerpt of this measure is provided in Appendix G. A 0 to 3 scale developed by Kerr, Sallis, Rosenberg, Norman, Saelens, and Durant (2008) was used for parents to indicate how frequently they accessed the resource. Parents reported how often, "my child is active here" by selecting one of four categories: 0 = never, 1 = Once a month or less, 2 = Once every other week, or 3 = Once a week or more. Kerr et al. (2008) used this scale to have parents rate the frequency of use of physical activity resources in general places (e.g., indoor recreation facilities, bike paths, public parks); and found across 17 items, the ICC = .416 - .852.

At the final home visit in the present study, the experimenter collected data related to two facets of the physical activity resources. First, parents were asked to identify all of the physical activity resources they could within a half mile from their home, by resources type (this was done before they were provided with the list of all resources in their neighborhood). For example, if there were one or more trails within a half mile of the participant's home, the experimenter asked, "Can you name any trails within a half mile of your home?" (If the internet search and windshield tour did not identify any trails within a half mile of the participant's home, the experimenter did not ask about trails). Then, parents were given a list of all resources available within a half mile from their home with the rating scale adapted from Kerr et al.

(2008), as described in the previous paragraph. These lists were reviewed, and parents rated the frequency of use. Each resource on the list contained the resource's name (if it had a name) and location (either address or intersection). Parents were also given a map in which addresses and intersections could be referenced, to help them accurately determine their frequency of each physical activity resource's use.

Following the final home visit, the PARA instrument was used to assess each resource that parents identified using at least once (i.e., "Once a month or less"). The experimenter rated each of these resources (N = 10) for features, amenities, and incivilities. A second rater was trained to assess physical activity resources. This training involved having the second rater read the assessment instrument and discuss the instrument with the experimenter to assure understanding of the instrument's applications and the operational definitions. Both raters assessed a practice physical activity resource and then discussed their ratings with each other. Two of the resources – one outdoor resource (a park) and one indoor resource (a community center) – were randomly selected for this reliability check.

### **Measurement for Aim 2: To answer five key questions related to implementation of this intervention**

Five questions related to the implementation of the intervention were examined. The procedure used to examine each question is described.

**Implementation Question 1: What types of physical activity goals did parents set for their child?** Parents completed weekly goal setting sheets (described in detail, in the next subsection). Goal sheets were collected at the beginning of each home visit; parents received \$5.00 for submitting completed goal sheets. The goal sheets enabled a descriptive analysis of the goals parents set. Goals were categorized by physical activity category (aerobic activities, sports

activities, unstructured activities, household task/chores, muscle/bone strengthening activities, structured activities, active transportation, undetermined, and multiple categories).

**Implementation Question 2: What were the characteristics and outcomes of parent-determined behavioral contracts to promote physical activity by their child?** The intervention also involved a review of other permanent products generated by parents. Parents completed weekly behavioral contracts (described in detail, in the next subsection) that was reviewed to assess parent-determined behavioral contracts.

**Implementation Question 3: How accurately did parents reinforce 10 minute bouts of physical activity by their child?** One component of the intervention asked parents to provide their child with a sticker for every ten minutes of moderate-to-vigorous physical activity that he or she accumulated. If children collected enough stickers throughout the week, they would be given access to one to two parent-determined reinforcers. Children could earn up to six stickers each day for meeting the physical activity guideline (60 minutes of moderate-to-vigorous physical activity daily). After earning six stickers, parents were encouraged to continue to be active with their child, providing verbal encouragement. Children placed each sticker they earned on their weekly behavioral contract. Stickers earned on the behavioral contract were compared to accelerometer data (described in the next section) to assess parent's fidelity of implementing the sticker provision protocol.

**Implementation Question 4: What is the intervention's effect on parental knowledge of physical activity guidelines for children?** Parents completed a pre-test that assessed their knowledge about the U.S. Department of Health and Human Service's physical activity guidelines. The pre-test assessed knowledge of the amount of physical activity children need and the frequency of vigorous physical activity needed. It also asked parents to identify six examples

of aerobic activity and six examples muscle or bone strengthening physical activity. Finally, parents were asked to identify at least four types of chronic conditions that physical activity can prevent. The test was in English and participants were given the choice of completing it themselves or having the experimenter read it to them, and write down their answers. An identical test was administered at the conclusion of the intervention. The physical activity guidelines knowledge assessment is included in Appendix H. The experimenter scored each parent response. An item-by-item table with each scoring decisions for each response can be reviewed in Appendix I.

**Implementation Question 5: What was the (child) participant’s compliance level with wearing the accelerometer?** Data from the accelerometers enable an analysis of participant wear time. Child participants wore ActiGraph accelerometers (Model # GT3X) for a total of five weeks during the study. ActiGraph accelerometers record movements in free-living settings. Parents were instructed to have their child wear the accelerometer from the time they woke up until the time they went to bed, except when coming into contact with water (i.e., showering, bathing, and swimming). The raw data provide minute-by minute movement counts, which are standardized movements that can be converted to intensity (e.g., moderate intensity). Although the definition of a “day” of monitoring is debated; 600 minutes (i.e., 10 hours) of wear time per day is recommended (Rowlands, 2007). The determination of non-wear time is also subject to debate; with some studies suggesting that 20 minutes to 180 minutes of consecutive non-movement counts indicates that the child has removed the device (Sirard & Slater, 2009; Troiano et al., 2008).

In the present study, days in which participants wore the device for 600 minutes or more, not including times they removed the device (60 or more consecutive minutes of 0 counts) were

included in the analysis. Wear time was determined by summing the total number of minutes each day the participant wore the device. The day began at the first minute with a movement count of 100 or greater after 12:00 AM. The day ended at 11:59 P.M. Any period of 60 or more consecutive minutes with a movement count of 0 was considered non-wear time.

**Measurement for Aim 3: To examine the effects of the intervention on daily levels of moderate-to-vigorous physical activity among child participants**

In this study, there were five, 7-day periods of accelerometer measurement. Four to seven day periods of accelerometer monitor has been found to result in reliable estimates of physical activity among children (0.77 – 0.86 ICC) (Troost et al., 2000). Accelerometers were attached to the participant's right hip using an elastic belt during the initial home visit. The experimenter observed a test use of the device to assure that both the child and the parent could remove and reattach the device. Accelerometer assessments began the day following the home visit, and lasted for seven days; accelerometers were set to record movement counts in 60 second intervals. Parents were offered daily text messages to remind them to attach the device to their child (all parents opted to receive these text messages). Text reminders were sent manually by the experimenter each morning, approximately 30 minutes after the child's typical wake up time. At the conclusion of the seven-day period, the parents were instructed to put the accelerometer in a safe place until the designated pickup time. When accelerometers were picked up by the experimenter, data were downloaded and exported to Microsoft Excel data tables for data reduction.

**Measurement for Aim 4: To determine satisfaction among children and parents who participate in the intervention**

During the final home visit, both children and parents answered a satisfaction survey. Children answered two questions related to their satisfaction. Before children answered either question, the experimenter reminded the child of some of the activities he or she did by stating, “This summer you did some physical activities like soccer, bike riding, and playing at the park.” Then, the experimenter asked the child to name other activities that he or she did, asking, “Can you think of other physical activities you did this summer?” After the child named other activities that he or she did, the experimenter asked the first question: “How much fun did you have this summer doing these physical activities.” Children were presented with three choices: NO Fun, A little fun, or a lot of fun. These choices were depicted visually, as displayed in Figure 3. The second question that was asked was, “Do you want to keep doing these physical activities?” As with the first question, children were presented with three options (NO, Maybe, or Yes); these options were also displayed visually.



*Figure 3.* Visual displays presented to the child participant when answering satisfaction questions.

The parent satisfaction survey consisted of 17 affirmative statements (e.g., “This program was helpful for my child to become more physically active”). Parents provided their level of agreement with each of the statements on a 1 (“Strongly Disagree”) to 7 (“Strongly Agree”) scale, with four representing “Neutral.” The 17 items on the parent satisfaction survey addressed parental agreement with positive statements of general health (e.g., “I am satisfied with my child’s current level of physical activity.”) and satisfaction with the intervention items (e.g., “I would recommend this program to other parents I know”). The parent satisfaction measures also assessed parental agreement with positive statements related to specific program components including: the education component (N = 2), the goal setting component (N = 4), the behavioral contracting component (N = 3), and the physical activity report card component (N = 2). The final question on the satisfaction measure asked, “Please provide any other suggestions for improving this program. You may write in English or Spanish.” The parent satisfaction survey can be viewed in Appendix J.

## **Procedure**

**Baseline.** Participants received an accelerometer to begin wearing the following day, for seven days. Parents were instructed to have children maintain their typical daily routine.

**Intervention.** The intervention consisted of six components. The experimenter delivered each component of the intervention orally, at the participant’s home. Participants received a workbook that was used to support the oral description of the intervention. The intervention workbook was reviewed by a practicing pediatrician in Kansas City, MO, and he did not raise any concerns over the appropriateness or safety of the intervention. Each component and its delivery are described below; the entire workbook is available in Appendix K.

*Component 1: Health education.* A 1-page fact sheet on physical activity was reviewed with parents. This component was adapted from the U.S. Department of Health and Human Service's (2008) recommendations for physical activity, for children - ages 6 to 17. The fact sheet described physical activity requirements in terms of: amount, intensity (moderate vs. vigorous), types (aerobic vs. muscle and strength building), an example of how a child accumulated 60 minutes of physical activity throughout the day, and the physical and mental health benefits of physical activity. The Physical Activity Guidelines knowledge pre-test assessment was provided to the parent, and then the correct answers were reviewed, using the fact sheet.

*Component 2: Physical activity report card.* After the health education component, parents were presented with a "physical activity report card." The physical activity report card graphed the moderate and vigorous physical activity that the child accumulated during the seven day baseline (measured by accelerometer). It also provided parents with data on the average moderate-to-vigorous physical activity each day, the number of days their child reached 60 minutes of moderate-to-vigorous physical activity, and the number of days their child did vigorous activity (and average minutes of vigorous activity on those days). Parents were prompted to reflect on two main questions: 1.) "What is your reaction to this report card?" and 2.) "How can we improve on the next 'report card'?" An example of the physical activity report card can be seen in Figure 4.



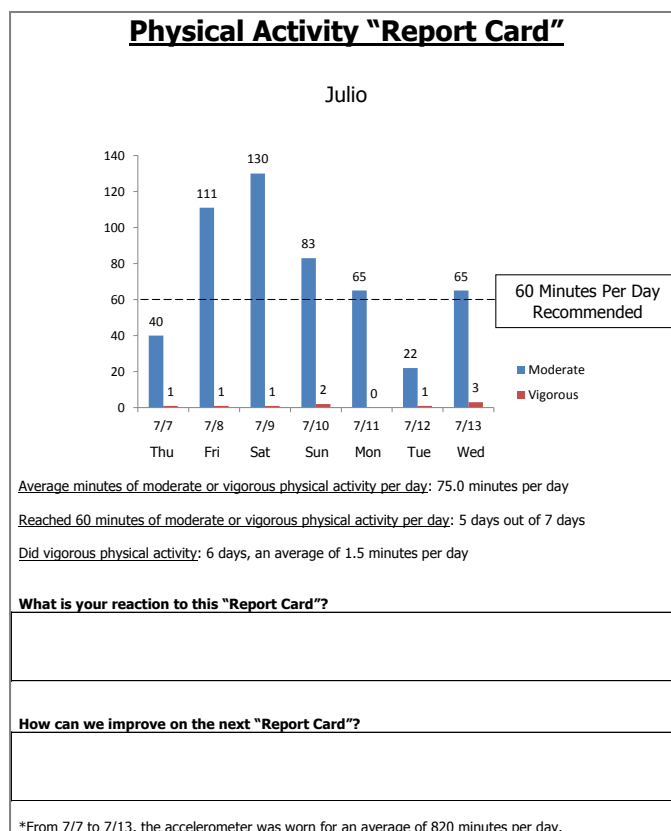


Figure 4. Physical activity report card.

*Component 3: Physical activity selection.* The next component of the intervention involved having the child select physical activities that he or she enjoyed. Following the review of the physical activity report card, the experimenter presented the child with 20 small pictures depicting different types of physical activities and instructed the child to indicate whether he or she liked the activity, or did not like it. The experimenter circled the names of the activities that the child indicated he or she liked; if the child had not participated in an activity, the activity was not circled. Figure 5 shows a sample of three of these pictures used to help the child participant determine physical activities that he or she liked. After the experimenter and child finished reviewing the list, the parent was presented an identical list (without pictures) and placed a checkmark next to the physical activities that she or he (the parent) would be “willing to do (with

the child).” Both parents and children were prompted to consider other physical activities (that were not included on the list) that they liked, or would be willing to do.

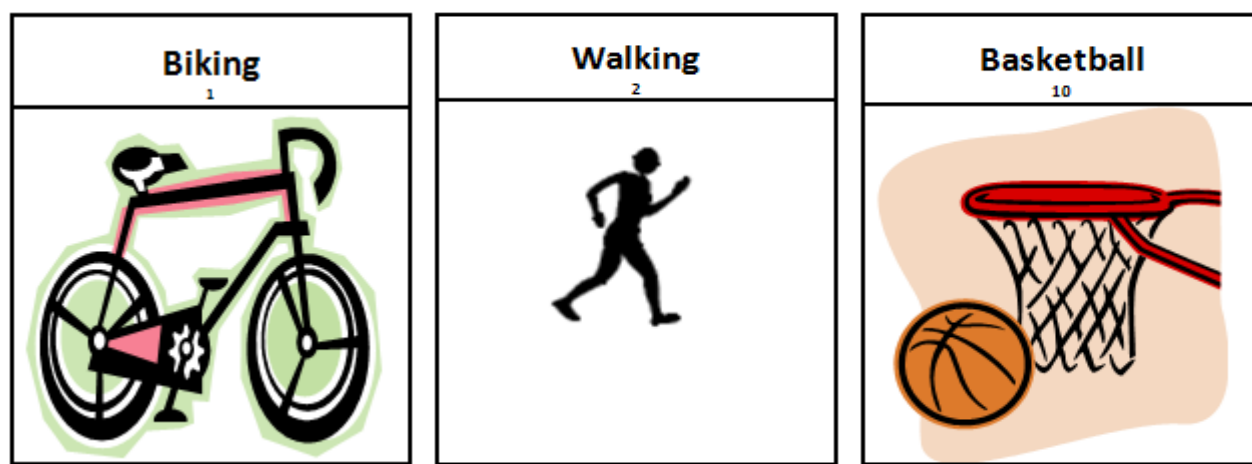


Figure 5. A sample of 3 (of 20) pictures of physical activities used to help the child participant indicate his or her physical activity preferences.

*Component 4: Seeking support for physical activities.* Parents were asked to consider other people that they would trust to be physically active with their child. Parents were told that this could be relatives, neighbors, or friends. In addition, parents were prompted to consider how these other individuals could help (e.g., walking their child to a piano lesson). Last, parents were asked to identify when the relative, neighbor, or friend could be active with their child (e.g., Tuesday and Wednesday mornings). Parents were asked to think of at least three people; however, space was provided to consider more than three. Parents recorded answers to these questions in their workbook.

*Component 5: Parental goal setting.* After considering preferred physical activities and who the child could be active with (other than the participating parent), the experimenter guided the parent through the process of setting goals. The goal-setting sheets provided a designated space for seven separate days. Each weekly sheet had five columns: 1) activity, 2) adult, 3) start time, 4) minutes (i.e., length of planned activity), and 5) complete (used to place a check mark

next to completed activities). To model the use of these goal sheets, parents completed one day of activities with the experimenter, reviewing preferred activities (of she or he and the child) and other people they would trust to be active with their child. The experimenter helped the parent consider the activities that she or he would typically do on a certain day when planning the start time and the length of the activity. The parent was instructed to complete the goal sheet every night (for the next day) or every morning (for that day). The experimenter reminded parents that if she or he completed the goal sheet and submitted it at the next home visit, a five-dollar cash incentive would be provided. Although parents considered physical activity preferences of their child, they did not set goals with their child.

*Component 6: Behavioral contracting and parental reinforcement of physical activity.*

Next, parents learned to write and implement behavioral contracts for their children. Parents received template behavioral contracts that modeled after the contracts described in Cooper, Heron, and Heward (2007). The contract specified the task (which stayed constant) – “For every 10 minutes of activity, you get a sticker.” The contract also specified when stickers could be earned; this stayed constant at “anytime.” The contract specified the reward. Parents were given 42 stickers per week to reinforce small bouts of physical activity (the reinforcement protocol is described in component 7). Children could earn up to six stickers each day for meeting the physical activity guideline (60 minutes of moderate-to-vigorous physical activity daily). So, children could earn one sticker for every 10 minutes of physical activity accumulated; these 10 minutes could be consecutive, or it could be accumulated over any period of time.

Parents were instructed to determine a high sticker goal and a moderate sticker goal. For each of these goals, parents indicated a sticker amount and a reward (the line reads, “For \_\_\_ stickers you get: \_\_\_\_.” Parents referred back to the physical activity report card and were

prompted to consider their child's actual level of physical activity when setting the high and low sticker amounts. The workbook also provided a list of potential reinforcers parents could choose for the behavioral contract. This list included edible items (e.g., frozen yogurt), tangible items (e.g., jump ropes), and activities (e.g., sleepovers with friends). Parents were encouraged to pick reinforcers with their children (and did so, the majority of the time). They were also encouraged to pick items that were inexpensive and easy to provide.

Parents were taught how to reinforce small bouts of their child's physical activity. As specified in the behavioral contract, parents provided a sticker to their child for every ten minutes of physical activity that he or she accumulated. These ten minutes of activity could be continuous or discontinuous. During health education (component 1), physical activity was defined as "body movement." Parents were reminded that moderate physical activity was the equivalent of brisk walking, and vigorous physical activity was the equivalent of running. This aligned with the *2008 Physical Activity Guidelines for Americans*, which states, "any episode of moderate- or vigorous-intensity physical activity, however brief, counts toward the Guidelines" (U.S. Department of Health and Human Services, 2008, p. 14). The experimenter instructed parents to provide stickers to their child, contingent upon 10-minute bouts of physical activity, using a 1-page set of instructions included in the workbook. This part of the workbook instructed parents to encourage or praise the child when physically active, provide the stickers as immediately as possible after the accumulation of physical activity, remind him or her why the stickers were being provided, and what he or she will get if they meet their weekly goal (the reinforcers specified on the contract). After the contract was completed, the child picked a physical activity that he or she wanted to do. As part of training, the experimenter, the parent, and the child then engaged in a brief, ten minute session of physical activity. After the session, the parent provided

the child with a sticker using the reinforcement protocol; the experimenter reminded the parent if he or she omitted any steps during the training session.

**During intervention.** During each home visit during the intervention, the experimenter followed a standard protocol. First, the goal sheet was collected and the behavioral contract was photographed (the child was allowed to keep the original behavioral contract with the stickers he or she earned). Next, incentives were provided, contingent on participation and adherence (a detailed description of incentive structure is provided in the following section). Then, the physical activity report card was reviewed with the parent, along with a review of the physical activity guidelines. The review of the physical activity guidelines involved the experimenter verbally quizzing the parent on the pre-test questions, and if they could not correctly respond to the question, the experimenter verbally reminded the parent of the correct answer. After that, the experimenter and parent reviewed the physical activity goals sheet, behavioral contract, and sticker reinforcement procedure. For each of these components, the experimenter asked the parent three questions: 1) What challenges came up with this? 2) Is there anything you did not understand or need help with? And, 3) What might you do differently this week? These questions were used to assess parent understanding of the intervention components and, if necessary, remind the parent how to correctly administer each component. When the sticker reinforcement procedure was reviewed, during training, the child was given the option of doing something physically active with the experimenter; if the child opted to be physically active he or she was allowed to pick a physical activity and the parent was encouraged to participate. Prior to the physical activity session, the experimenter reviewed the reinforcement protocol with the parent. These physical activity sessions lasted approximately ten minutes and after the parent provided the child with a sticker using the reinforcement protocol; the experimenter reminded the parent if

he or she omitted any steps. If the child opted not to do anything active, the reinforcement protocol was reviewed with the parent. Finally, the experimenter attempted to schedule the next meeting with the parent (parents would sometimes request a call near the end of the week, as their schedule was pending).

**Parent incentives for participation.** Parents received incentives contingent upon their participation and implementation of the intervention components. Parents could earn up to \$315 total across the duration of the study, contingent upon participation and adherence. The \$315 consisted of gift cards (up to \$50.00) and cash (up to \$265.00). Parents received a \$25.00 retail gift card immediately after completing the demographic survey during the baseline home visit, and immediately after completing the satisfaction survey during final home visit. Each of the five weeks children were assigned to wear an accelerometer, parents could earn up to \$45.00; parents were paid \$5.00 for each day their child wore the device for 10 hours or more (paid the following week, after the experimenter downloaded data and verified wear times) and \$10.00 for returning the device at the end of the 7-day assessment (paid immediately after the experimenter received the device). This payment structure for accelerometer compliance was used successfully with high school age adolescents in school settings (Sirard & Slater, 2009). The only payment parents received that related directly to the implementation of the intervention was a \$5.00 payment for each week they completed the “Physical Activity Goals” sheet.

**Implementation time.** The initial intervention visit took approximately 63 minutes of the experimenter’s time, on average (range: approximately 42 to 76 minutes). The weekly follow-up visits took approximately 42 minutes on average (range: approximately 19 to 75 minutes). The number of days between home visits was between 10.2 – 13.7 days (Raul = 10.2, Maria = 10.8,

Julio = 12.8, Carlos = 13.8, and Jimena = 12.8); the minimum number of days between visits possible would be 7, because of the 7-day assessments.

### **Experimental Design.**

A multiple baseline design across participants was used to examine the effects of the intervention. After the initial 7-day baseline, the experimenter plotted the daily levels of moderate-to-vigorous physical activity and visually inspected the amount and variability. Further, the standard deviation of daily minutes of moderate-to-vigorous physical activity was calculated for each participant. Two participants (Raul and Maria) with the least variability (i.e., lowest standard deviation) were selected to begin the intervention after the initial baseline, 7-day accelerometer probe.

After the second 7-day baseline assessment, the intervention was implemented with the next two participants (Julio and Carlos) with the least variability in their daily level of moderate-to-vigorous physical activity. Finally, after the third 7-day baseline assessment, the intervention was presented to the final participant (Jimena). Visual inspection of daily moderate-to-vigorous physical activity trend data was used to determine the effects of the intervention.

### **Results**

The results of this study are presented by each of the four research aims.

#### **Aim 1: To describe environmental variables related to physical activity in home and neighborhood settings, for these five youth, using three assessments**

**Behavioral interviews.** The results of the informal behavioral interviews suggest a variety of potential barriers to being physically active. Raul's mother had an idea of the types of physical activities that he liked and did not like, but expressed that she could not always find unique types of activities that he liked to do. For example, he liked being outdoors, and she knew

that he liked, “natural reservations,” a reference to parks or trails, but she did not know where to find one. Another barrier for Raul was that he had not yet started school and had not developed close friendships or peers with whom to be physically active. By contrast, when visiting family in Equator (where Raul had cousins his age), Raul’s mother observed that he lost weight and was much more active.

Maria’s mother articulated two main barriers for Maria to be active. When possible, the family walked (rather than drove). However, Maria’s mother expressed frustration with unleashed dogs in her area. At times, this presented a barrier for Maria and her family to being physically active – especially through active transportation. Maria’s mother also shared a second transportation barrier – she does not always have access to a car, and visiting Maria’s favorite park is sometimes not feasible to reach.

Julio’s mother expressed dissatisfaction with the built environment – specifically the lack of sidewalks in their neighborhood presented a barrier. Julio’s family did not have a yard that was large enough for physical activity. Across the street, Julio’s mother, his siblings, and he would visit an open field; however, if the grass was not cut, this field was not suitable for use. Julio’s mother also expressed a social barrier related to the lack of neighbors on her street.

Carlos’ mother felt that the biggest barrier for him was his inability to be engaged in any physical activity for a sustained period of time. Although Carlos was interested in participating in physical activities, he often became “bored, tired, or thirsty” according to his mother. Carlos’ interest in organized activities also affected his participation in structured activities. His father took him to a 45 minute soccer clinic, but Carlos asked to leave after 20 minutes. Carlos’ mother reported that in these types of situations, he also expressed fear that he would hurt other children, as he was often much larger than they were.



Finally, for Jimena, the most notable barrier her father mentioned was the heat (during the summer period of this study). “At this moment, what can she do?” expressed her father. “I see kids playing outside, they sweat a lot, and I don’t want that to be her,” he expressed. “All she can do at this point is watch T.V. and rest.” Jimena’s father also expressed an awareness that he could do more to be active with her, but that when he came home (typically at 7:00 P.M.) he was tired and often did not want to take her to the park.

All parents shared that family or friends help their children be active. For Raul, Maria, and Jimena, family helped promote a more active lifestyle. For example, when Raul’s mother takes him to a retail store, she made time for them to walk around the store for exercise. Jimena’s grandmother walks every morning and Jimena enjoys walking with her. Maria, her two older sisters, and her mother walked (rather than drove) often to the doctor’s office and other appointments. For Julio and Carlos, time with cousins and friends presented opportunities to accumulate physical activity and enjoy it. Two parents (the mothers of Raul and Carlos) shared that when around other children their age, they tend to be very active. Raul’s mother and Jimena’s mother also have implemented practice to promote physical activity; Raul’s mother has him run 12 laps around the downstairs part of their house, daily. Jimena’s mother has her ride the stationary bike after eating a big meal.

**Physical Activity and Media Inventory (PAMI) – home environment.** Results of the Physical Activity and Media Inventory (PAMI) show a variation in the summary scores (the sum of each physical activity or media item’s accessibility) by category. Results of the PAMI are displayed in Table 8. Across the five participants, the “sports equipment” category showed the largest range of scores by participant, with a summary score of range of 2 to 41. Variation across participant summary scores for the transportation equipment category scores (2 to 20), athletic

footwear category (8 to 25), and outdoor yard equipment was moderate. For the media category (working media equipment) variation across participant summary scores were also moderate (14 to 30). The summary score data across the fitness equipment category scores (2 to 12) and the water sports equipment (0 to 8) showed the least variation; three of the participants reported owning 0 or 1 pieces of water sport equipment.

The PAASS (Physical activity Availability and Accessibility Summary Score) and MAASS (Media Availability and Accessibility Summary Score) revealed a variation in physical activity and media items in participants' homes. Raul's PASS (104) was notably higher than other participants (16 – 71). Jimena's PASS was notably lower (16). The variation in media equipment was less pronounced, ranging from 14 (Jimena) to 30 Julio. The ratio of the PAASS to the MAASS also show a differences in overall home environment with Raul and Carlos scoring the highest (5.2 and 4.0, respectively), Maria and Julio scoring in the middle (2.6 and 2.4, respectively), and Jimena scoring the lowest (1.1).

Table 8

*Results of the Physical Activity and Media Inventory (PAMI)*

Item Category	Summary Scores				
	Raul	Maria	Julio	Carlos	Jimena
Sports equipment	41	13	34	16	2
Fitness equipment	12	10	2	8	2
Transportation equipment	10	14	20	15	2
Athletic footwear	25	8	14	12	10
Water sports	8	0	1	4	0
Outdoor / yard equipment	8	14	0	9	0
Working media equipment	20	23	30	16	14
PAASS	104	59	71	64	16
MAASS	20	23	30	16	14
Overall home environment score	5.2	2.6	2.4	4.0	1.1

**Physical Activity Resource Assessment (PARA) neighborhood environment.** The results of the internet search and windshield tour (the initial steps of the Physical Activity Resource Assessment) show that participants had between 3 – 9 physical activity resources, such as parks, within a half mile radius of their home (not including schools or churches). Some of the half mile radius' that were drawn for participants overlapped with each other; so, some of the resources were located a half mile from more than one participant's house. Julio's family moved during the intervention (between 7-day accelerometer assessment 3 and 4), so both his current and previous neighborhoods were assessed.

Participants were first asked to identify all of the physical activity resources they could within a half mile from their home, by resources type. For example, if there were one or more trails within a half mile of the participant's home, the experimenter asked, "Can you name any trails within a half mile of your home?" (If the internet search and windshield tour did not identify any trails within a half mile of the participant's home, the experimenter did not ask about trails). Across all six participants, 31 resources were identified within a half mile of the participant's homes. Participants were able to name 6 of these 31 resources (19.4%). Among the six resources that were named, participants identified 4 out of 17 parks (23.5%), 1 out of 2 sports facilities (50.0%), and 1 out of 4 community centers (25.0%). Table 9 displays the number of physical activity resources that each parent was able to name.

Table 9

*Physical Activity Resources within Each Participant's Community and the Number of Resources Parents Could Identify*

Resource Type	Raul		Maria		Julio (current)		Julio (previous)		Carlos		Jimena	
	Existing	Named	Existing	Named	Existing	Named	Existing	Named	Existing	Named	Existing	Named
Park	4	1	3	1			3	1	3	0	4	1
Sport facility			1	0			1	1				
Trail	2	0			2	0					1	0
Community center	2	0					2	1				
Dance studios	1	0	1	0							1	0
Total	9	1	5	1	2	0	6	3	3	0	6	1

After participants named each physical activity resource they could, they were given a list of all resources available within a half mile from their home. These lists were reviewed, and parents rated the frequency of use. Among the 31 resources that were available within a half mile from the six homes, participants reported using 8 of these resources (25.8%). Six of the resources were parks and two were community centers. Participants reported using three of the parks, although they were not able to name them when asked, “Can you name any parks a half mile or less from your home?” One participant reported using a community center, although she was not able to name it when asked about any community centers. Participants also identified 2 churches that they went to, to be physically active. For both churches, only the outside of the church was assessed. These ten resources were rated using the PARA. The rating scale ranged from 0 to 3. Table 10 shows the types of features, amenities, and incivilities that were identified in the 10 resources that were rated.

Table 10

*Features, Amenities, and Incivilities Rated Using the Physical Activity Resource Assessment (PARA)*

Resource Type	Features	Amenities	Incivilities
Parks (N = 6)	Baseball field	Access Points	Broken glass
	Soccer field	Bathrooms	Dog refuse
	Bike Rack	Benches	Evidence of alcohol use
	Play equipment	Drinking fountain	Graffiti/tagging
	Sandbox	Landscaping efforts	Litter

	Sidewalk	Lighting	No grass
	Tennis courts	Picnic tables shaded	Overgrown grass
	Trails – running/biking	Picnic tables no-shade	Vandalism
	VB courts	Shelters	
		Trash containers	
Community Centers (N = 2)	Basketball courts	Access Points	Litter
	Bike Rack	Bathrooms	
	Exercise Stations	Benches	
	Play equipment	Drinking fountain	
	Sidewalk	Landscaping efforts	
	Trails – running/biking	Lighting	
		Picnic tables no-shade	
		Shower/Locker room	
		Trash containers	
Churches (N = 2)	Basketball courts	Access Points	Dogs Unattended
	Play equipment	Drinking fountain	Litter
		Landscaping efforts	Overgrown grass
		Shower/Locker room	
		Trash containers	

When presented with this list, participants reported using 0 to 4 resources that were within a half mile of their home. Table 11 lists the physical activity resources that each parent reported using. Frequency of resource use show that Maria and Jimena tended to use a church and park every 7 days or more often. Raul used two different parks every 14 days. All other resources that were identified as being used were used much less frequently (every 30 days or less often). The features, amenities, and incivilities at each resource used ranged from 1 to 7 features, 0 to 10 amenities, and between 0 to 5 incivilities.

Table 11

*Physical Activity Resources Participants Reported Using, Their Ratings, and the Frequency of Reported Use*

Resource	Number (Average Rating)		Frequency of Use
	Amenities	Incivilities	

	Features			
<b>Raul</b>				
Park 04	7 (2.0)	5 (2.2)	3 (1.6)	Every 14 days
Park 05	3 (2.3)	6 (2.5)	5 (1.0)	Every 14 days
Community Ctr. 01	2 (3.0)	7 (2.7)	0 (0.0)	Every 30 days or less often
<b>Maria</b>				
Park 01	2 (2.0)	5 (2.4)	4 (2.3)	Every 30 days or less often
Church 02	1 (2.0)	7 (2.0)	2 (1.5)	Every 7 days or more often
<b>Julio (old residence)</b>				
Park 02	2 (3.0)	7 (2.4)	2 (2.5)	Every 30 days or less often
Park 03	2 (2.5)	7 (2.5)	4 (2.0)	Every 30 days or less often
Community Ctr. 02	5 (3.0)	9 (2.8)	1 (3.0)	Every 30 days or less often
Church 01 (outdoor)	1 (2.0)	0 (0.0)	1 (2.0)	Every 30 days or less often
<b>Julio (new residence)</b>				
(No resources used)				
<b>Carlos</b>				
(No resources used)				
<b>Jimena</b>				
Park 06	4 (3.0)	10 (2.7)	4 (2.0)	Every 7 days or more often
<b>Mean</b>	<b>2.9 (2.48)</b>	<b>6.3 (2.22)</b>	<b>2.6 (1.79)</b>	

Park 05 was randomly selected for a reliability check, among all outdoor resources (i.e., six parks) that participants reported using (not including the resources in Julio's old neighborhood). The reliability check was conducted with a second graduate student in Behavioral Psychology. The protocol began with the two raters walking around the park, and noting the presence or absence of features and amenities. This was done together, with verbal exchange and consensus about what features/amenities would be scored. Then, both students rated each of the agreed upon features and amenities independently as Poor (1), Mediocre (2), or Good (3). If a feature or amenity's operational definition for a rating (poor, mediocre, or good)

had more than one attribute, raters counted those that were relevant and those that were not. For example, the operational definition for the rating of poor (1) for Play Equipment reads, “Several pieces are in need of major repair and is almost or unstable, there is a lot of trash, and the ground is overgrown or barren.” If “several pieces were in need of major repair” but there was not “a lot of trash” and the ground was not “overgrown or barren,” the rater would note that only one of the three characteristics related to that rating category. Rating categories were selected based on the number of relevant attributes. If two categories had the same number of relevant attributes (i.e., both the “Poor” and the “Mediocre” categories contained two relevant attributes), then both were selected. After rating all features and attributes, the raters scored all incivilities independently as either 0 (not present), 1 (poor), 2 (mediocre), or 3 (good); hence, for the incivilities category, there could be disagreement on the presence or absence of an incivility. Park 05 had 10 features and amenities; 3 incivilities were identified among both raters. Reliability was 92.3% (agreements = 12, disagreements = 1).

Community center 02 was randomly selected for a reliability check, among all indoor resources (i.e., two community centers, two churches) that participants reported using (not including the resources in Julio’s old neighborhood). The reliability check was conducted with a part-time employee of the experimenter’s research group who had three years of experience collecting survey data. The protocol began with interviewing an employee of the community center. The interview involved asking her about the presence or absence of each feature (N = 13) and amenity (N = 12). Then, the employee provided a tour of the facility to the raters. During and after the tour, the raters rated each of the features and amenities as Poor (1), Mediocre (2), or Good (3). As with the outdoor resource, if a feature or amenity’s operational definition for a rating (poor, mediocre, or good) had more than one attribute, raters counted those that were

relevant and those that were not. Rating categories were selected based on the number of relevant attributes. If two categories had the same number of relevant attributes (i.e., both the “Poor” and the “Mediocre” categories contained two relevant attributes) then both were selected. After rating all features and attributes, the students rated all incivilities as either 0 (not present), 1 (poor), 2 (mediocre), or 3 (good); hence, for the incivilities category, there could be disagreement on the presence or absence of an incivility. Community center 02 had 14 features and amenities; 1 incivility was identified among both raters. Reliability was 93.3% (agreements = 14, disagreements = 1).

**Aim 2: To answer five key questions related to implementation of this intervention**

**Implementation Question 1: What types of physical activity goals did parents set for their child?** During the initial intervention visit, the experimenter verbally presented 17 different physical activities and displayed a picture of each, asking the children to indicate which they liked. Then, the experimenter presented an identical written list to the child’s parent, asking them to indicate which of the physical activities “I am willing to do (with my child).” Among these 17 activities, both child and participants reported liking an average of 10.6 of the activities. Among the list of 17 physical activities, activities that children like and parents were willing to do corresponded for an average of 7.6 activities per child-parent pair. Children and parents also named additional physical activities they liked or were willing to do: cleaning the garage (Maria), swimming (Julio), aerobics and swimming (Raul’s mother), and yard work (Carlos’ mother). Table 12 shows the list of physical activity preferences, by child and parent, for each pair.

Table 12

*Physical Activity Preference Assessment Results*



Activity	Raul		Maria		Carlos		Julio		Jimena	
	Child	Parent	Child	Parent	Child	Parent	Child	Parent	Child	Parent
Biking	✓	✓	✓	✓		✓	✓	✓	✓	✓
Walking		✓		✓		✓		✓		✓
Dancing		✓	✓	✓	✓	✓			✓	✓
Rollerblading			✓						✓	
Skateboarding									✓	
Soccer	✓		✓	✓	✓	✓			✓	✓
Basketball				✓	✓	✓		✓	✓	✓
Football	✓		✓		✓					
Baseball, softball, Wiffle ball	✓		✓	✓	✓	✓	✓	✓	✓	✓
Hockey (on pavement)	✓		✓		✓					
Kickball	✓				✓	✓	✓	✓	✓	
Using the playground	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Jumping rope		✓	✓	✓	✓	✓	✓	✓	✓	✓
Cleaning bedroom	✓	✓	✓	✓		✓		✓		✓
Helping with laundry	✓	✓			✓	✓		✓	✓	
Helping wash the car	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sweeping, vacuuming		✓			✓	✓	✓	✓	✓	
Total	10	9	11	10	12	13	7	11	13	10

*Note.* Carlos' mother reported her preferred physical activity after the intervention ended.

Parents typically set 1 - 3 physical activity goals per day for their child. Among the goals in which a specific time (e.g., 1:30 PM) or a general time (e.g., afternoon) was specified, goals were set most often for the afternoon hours (between 12:00 – 4:00 P.M.). Across all participants, 70 physical activity goals (41.2%) were set for the afternoon hours. Fewer goals – 52 (30.6%) – were set for the morning hours (between 6:45 – 11:10 A.M.). The fewest goals 48 (28.2%) were set for the evening hours (between 5:00 – 9:40 PM).

The most common type of physical activity planned for was aerobic activities, including walking, biking and roller skating. Between 41.7% and 86.7% of all goals set by individual parents involved aerobic activity. Sports activities (e.g., soccer, basketball, football) represented the next most frequent class of physical activities planned for. Across all participants, 35 (19.3%) of all planned physical activities were sports activities. Parents planned for a variety of other types of activities, including unstructured physical activities, such as going to the playground (21 (11.6%) of all planned activities), household tasks (which was planned most often for Julio), and

muscle/bone strengthening activities which consisted exclusively of jumping rope (6 (3.3%)).

Table 13 provides detail on physical activity goals set. Appendix L provides each physical activity planned for, by physical activity type listed in Table 13.

Table 13

*Count (Percentage) of Physical Activities Planned on Goal Sheets*

Physical Activity Type	Participant					All
	Raul	Maria	Carlos	Julio	Jimena	
Aerobic activities	31 (44.3%)	31 (63.3%)	6 (54.5%)	15 (41.7%)	13 (86.7%)	96 (53.0%)
Sports activities	23 (32.9%)	10 (20.4%)		2 (5.5%)		35 (19.3%)
Unstructured activities	13 (18.6%)	3 (6.1%)		5 (13.9%)		21 (11.6%)
Household tasks/chores		1 (2.0%)		11 (30.5%)		12 (6.6%)
Muscle/bone strengthening activities	2 (2.9%)	3 (6.1%)		1 (2.8%)		6 (3.3%)
Structured activities		1 (2.0%)	2 (18.2%)			3 (1.7%)
Active transportation			3 (27.3%)			3 (1.7%)
Undetermined				2 (5.5%)	1 (6.7%)	3 (1.7%)
Multiple categories	1 (1.4%)				1 (6.7%)	2 (1.1%)

*Note.* Percent may not equal 100 due to rounding.

**Implementation Question 2: What were the characteristics and outcomes of parent-determined behavioral contracts to promote physical activity by their child?** Parents wrote behavioral contracts during every home visit (including the intervention visit). Raul's mother and Maria's mother developed four contracts, Carlos' mother and Julio mother developed three contracts, and Jimena's father developed two contracts. As described in the methods section,

children earned stickers for every ten minutes of physical activity they accumulated. Parents and children set a “high” sticker goal and a “low” sticker goal. They also determined a reinforcer for obtaining high and low sticker goals. Reinforcers chosen included edible items (e.g., Twizzlers candy), activities (e.g., going to see a movie), and tangible items (e.g., picking out a new toy car). Table 14 provides a list of the reinforcers chosen by parents and children for each behavioral contract they wrote.

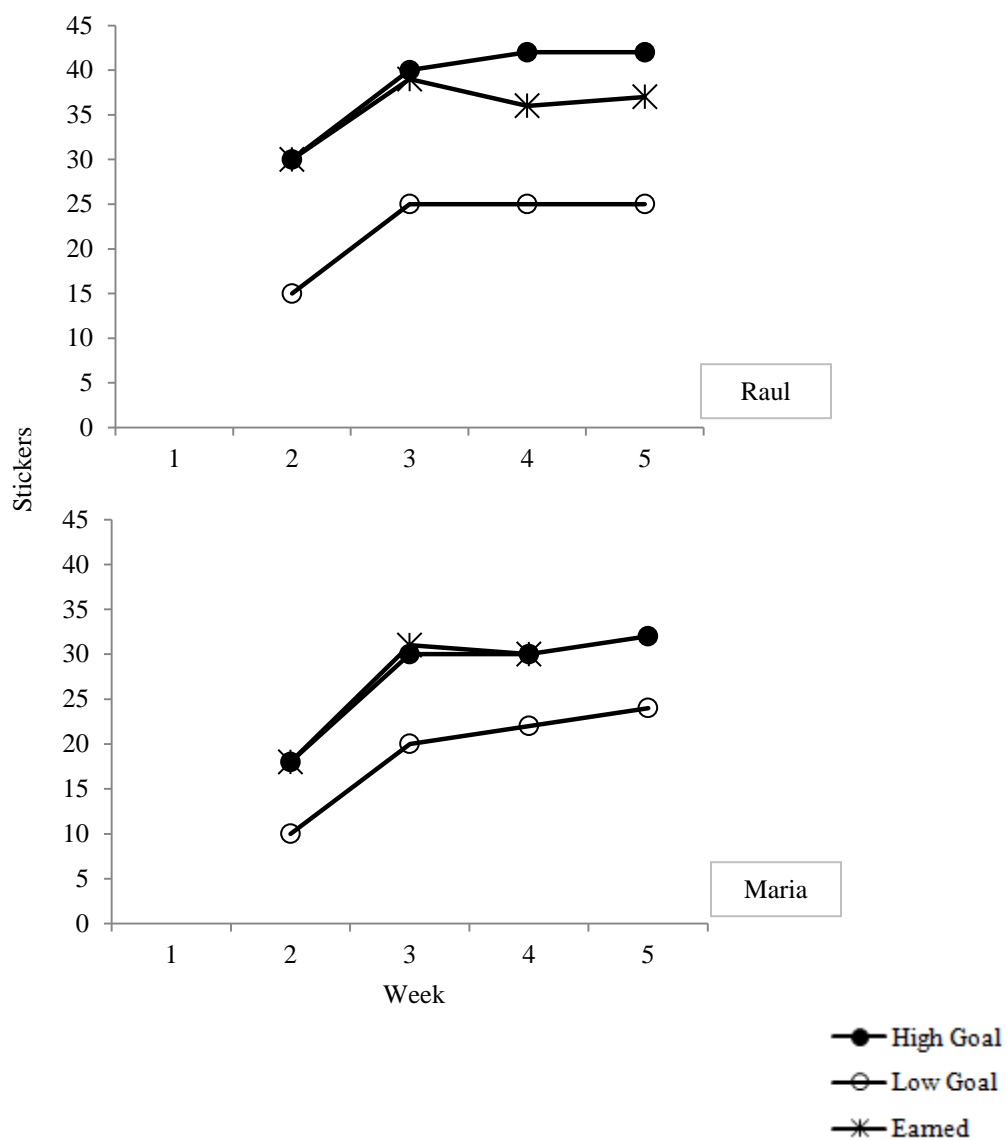
Table 14

*Behavioral Contract Reinforcers Chosen for Low and High Sticker Goals*

Participant	Week 2		Week 3		Week 4		Week 5	
	Low	High	Low	High	Low	High	Low	High
Raul	Bubble bath	Movie	Water fountain	Movie	Cup cakes	Car	Water fountain	Movie
Maria	Movies	Lunches	Fish and bowl	Chuck-E-Cheese	Bird	Chuck-E-Cheese	(Missing)	(Missing)
Carlos			Dollar Store	Walmart	Dollar Store	Walmart	Dollar Store	Skateboard
Julio			Twizzlers	Water park	Water park	Pool	Pool	(Missing)
Jimena					Water balloons	Color books	(Missing)	(Missing)

Raul and Maria received the intervention after one 7-day baseline probe, and completed four contracts each. Raul and his mother set “low” sticker goals between 15 and 25 stickers; they set high sticker goals between 30 and 42 stickers. Raul exceeded the low sticker goal each week, and earned his high sticker goal for the first contract, but missed meeting his high goal for contracts 2, 3, and 4. Maria and her mother set the low sticker goals between 10 and 22 stickers; they set high sticker goals between 18 and 30 stickers. Maria met her high sticker goal for the first, second, and third contract. Maria’s mother completed the fourth contract, but was not able

to locate it during the following visit. Sticker goals and actual stickers obtained for Raul and Maria can be seen in Figure 6.



*Figure 6.* Behavioral contract goals and stickers earned by Raul and Maria.

Carlos and Julio received the intervention after two 7-day baseline probes, and completed three contracts each. Carlos and his mother set “low” sticker goals between 15 and 30 stickers; they set high sticker goals between 21 and 40 stickers. The results of the first contract were omitted because Carlos’ mother’s basic understanding of the contract was incorrect (she believed

he was only allowed to earn one sticker per day). Carlos met or exceeded the low sticker goal during weeks four and five, but did not meet the high sticker goal either week. Julio and his mother set the low sticker goals between 34 and 38 stickers; they set high sticker goals between 40 and 42 stickers. Julio exceeded his low sticker goal during the first week (but did not meet the high sticker goal). During weeks 4 and 5 Julio did not meet his low or high sticker goals. Sticker goals and actual stickers obtained for Carlos and Julio can be seen in Figure 7.

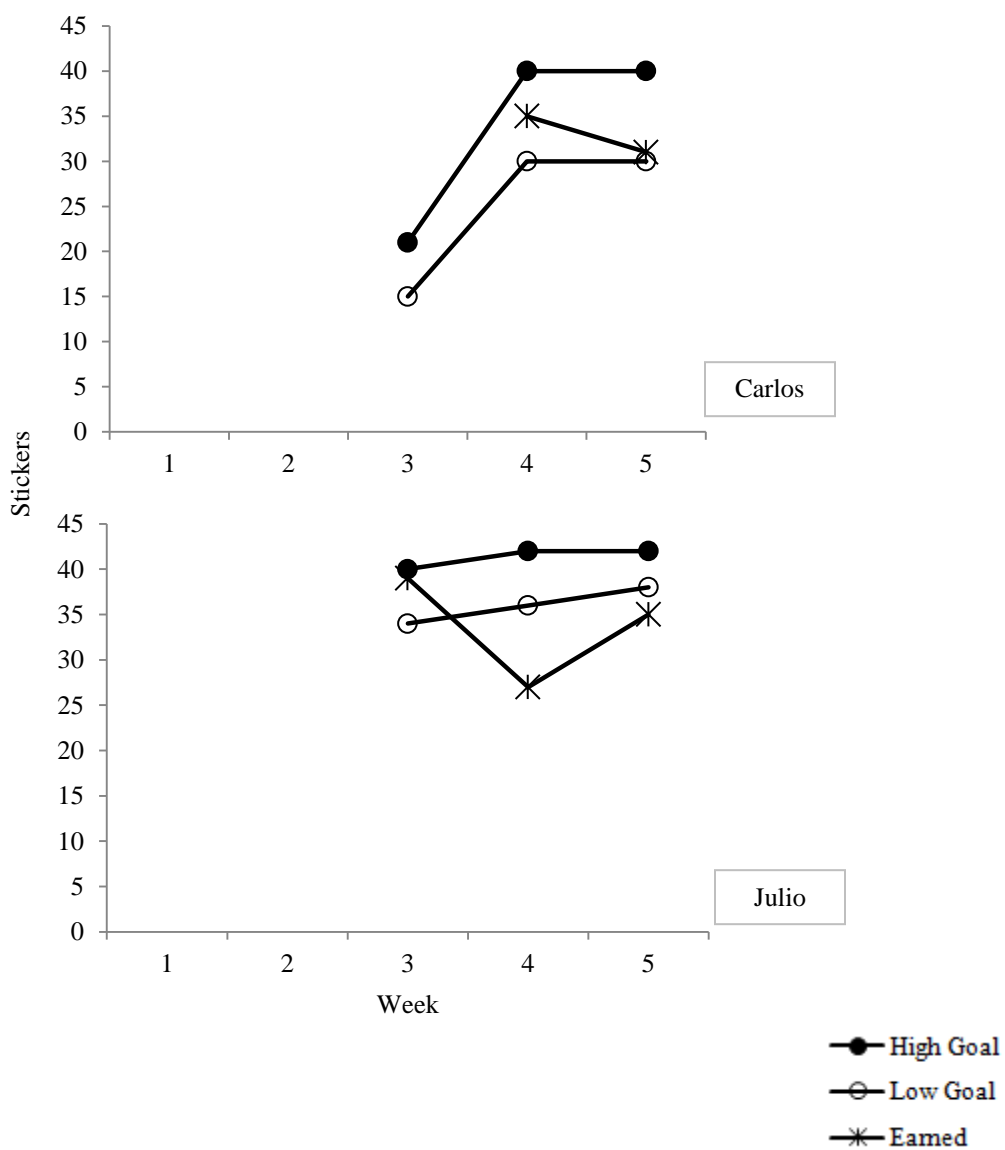


Figure 7. Behavioral contract goals and stickers earned by Carlos and Julio.

Jimena received the intervention after three 7-day baseline probes, and completed two behavioral contracts. Jimena and her father set their first contract (during visit 4) low sticker goals at 35 stickers; they set high sticker goals at 40 stickers. Jimena missed meeting both her low and high goal for her first contract, earning 28 stickers. Her next contract was blank; none of the items on the behavioral contract had been completed. However, she was provided stickers, contingent on her physical activity that week, earning a total of 34 stickers. Sticker goals and actual stickers obtained by Jimena can be seen in Figure 8.

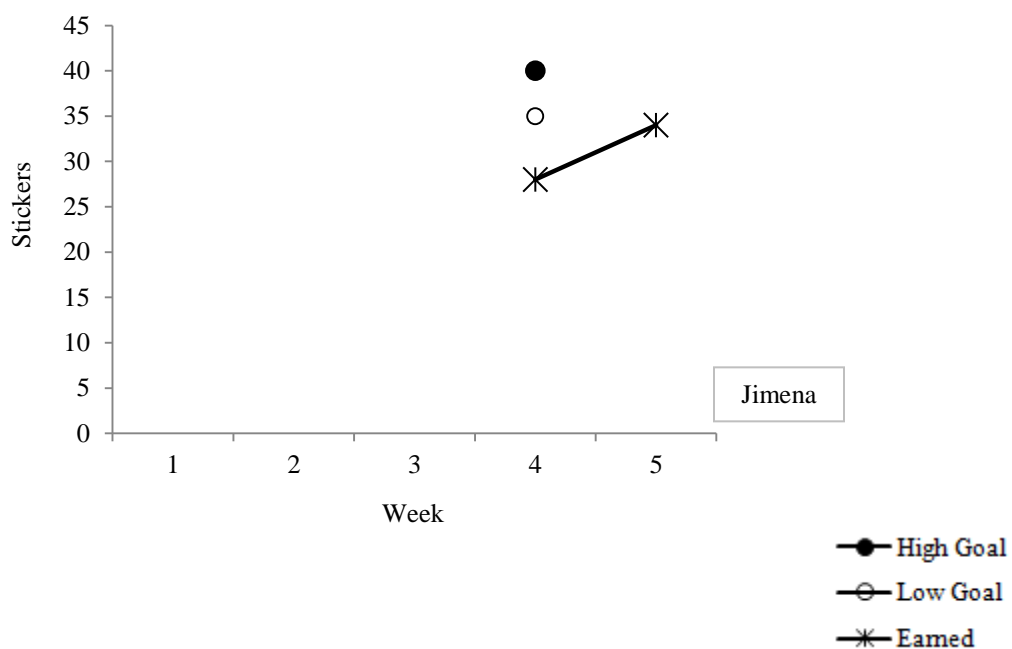


Figure 8. Behavioral contract goals and stickers earned by Jimena.

**Implementation Question 3: How accurately did parents reinforce 10 minute bouts of physical activity by their child?** One component of the intervention involved a protocol that instructed parents to provide their child with a sticker for every ten minutes of physical activity that he or she accumulated. Children could earn up to six stickers each day for meeting the physical activity guideline (60 minutes of moderate-to-vigorous physical activity daily). Children placed each sticker they earned on their weekly behavioral contract. Stickers earned on the

behavioral contract were compared to accelerometer data to assess parent's fidelity of implementing the sticker provision protocol.

Fidelity of implementation was assessed in day-long intervals. This involved determining the total minutes of moderate-to-vigorous physical activity (MVPA) accumulated by a participant between the hours of 12:00 AM – 11:59 PM (indicated by accelerometer data) and dividing this number by the total number of stickers the child earned that day (indicated by the behavioral contract). This resulted in a ratio of minutes of MVPA per sticker earned. A ratio of 10.0 represented perfect fidelity of implementing the sticker provision protocol (i.e., provision of a sticker for every ten minutes of physical activity).

Days in which participants engaged in 1 to 60 minutes of physical activity were selected for this fidelity assessment. Since children could earn up to six stickers each day (and no more than 6 stickers per day), days that participants accumulated 61 minutes or more of MVPA still resulted in earning six stickers. Therefore, the ratio (minutes of MVPA per sticker earned) would not provide an accurate measure of fidelity of implementation. Days in which participants did not complete the behavioral contract or wear the accelerometer were excluded from this assessment. Days that involved a device malfunction were also excluded in this assessment. Finally, one week of days for Carlos and two days for Jimena were excluded from the assessment because of a parent misunderstanding of the reinforcement procedure.

Across the five participants, valid accelerometer data during the intervention phase was collected on 97 of 175 days. Twenty-six days out of 97 (26.8%) were included in this assessment of the sticker provision protocol; these were days that met the criteria explained in the previous paragraph. One day came from Raul's accelerometer data, five days came from Maria's data, six days came from Carlos' data, seven days from Julio's data, and seven days from Jimena's data.

Raul's mother provided a sticker for every 14.3 minutes of moderate-to-vigorous physical activity (MVPA) he accumulated. Across seven days, Maria's mother provided a sticker for every 6.8 to 17.5 minutes of MVPA she accumulated. On one of the seven days (July 25<sup>th</sup>) she was close (within 1 minute of the target ratio), providing a sticker for every 9.8 minutes of MVPA that Maria accumulated. Across six days, Carlos' mother provided a sticker for every 4.5 to 14.5 minutes of MVPA he accumulated. On three of the six days, she was close (within 1 minute of the target ratio), providing a sticker for every 9.5, 9.8, and 9.8 minutes of MVPA Carlos accumulated. Across seven days, Julio's mother provided a sticker for every 3.5 to 23.0 minutes of MVPA he accumulated. The closest Julio's mother got to providing a sticker for every 10 minutes of MVPA he accumulated was on July 26<sup>th</sup>, when he received a sticker for every 12.3 minutes of MVPA he accumulated. Finally, across seven days, Jimena's father provided a sticker for every 6.7 to 14.8 minutes of MVPA she accumulated. On one of the seven days, he was close (within 1 minute of the target ratio), providing a sticker for every 9.5 minutes of MVPA that Jimena accumulated. Ratios of minutes of MVPA per sticker earned can be seen for Maria, Carlos, Julio, and Jimena in Figure 9.



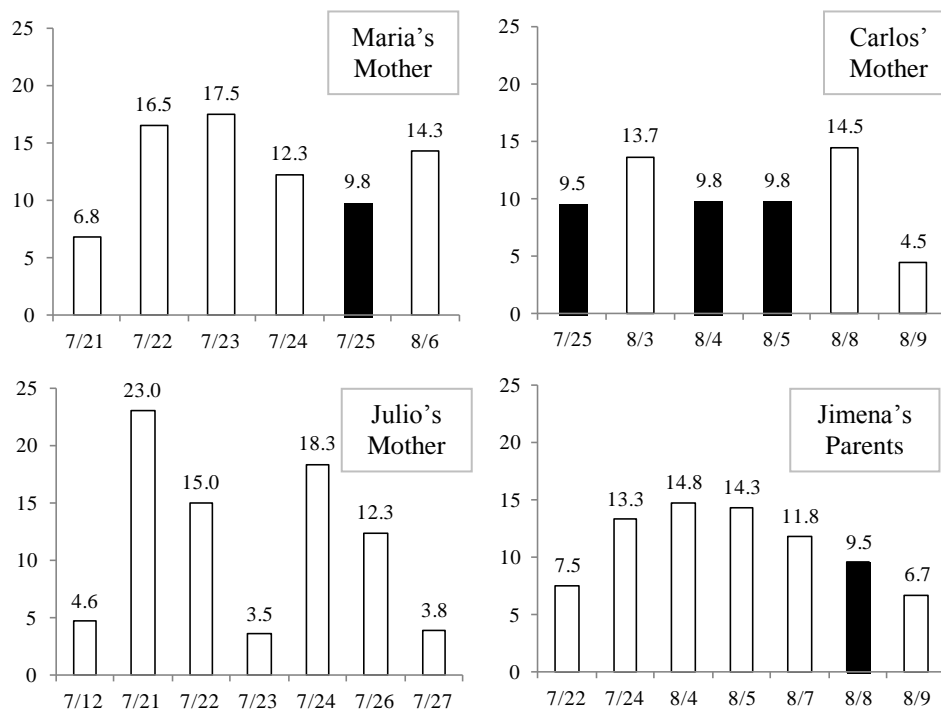


Figure 9. Ratio of minutes of moderate-to-vigorous physical activity (MVPA) per sticker provided for days in which participants engaged in 60 minutes or less of MVPA.

**Implementation Question 4: What was the intervention's effect on parental knowledge of physical activity guidelines for children?** Prior to the intervention, parents correctly answered 55.5% (Range = 38.9% - 83.3%) correctly on the 18-item physical activity knowledge assessment. Following the implementation of the intervention, three out of five parents (Raul's mother, Maria's mother, and Julio's mother) increased the number of correct responses on the knowledge test. At post-test, parents correctly answered 68.2% (Range = 66.7% - 72.2%). Carlos' mother provided the same number of correct responses (72.2%) on both the pre and post knowledge assessment. Jimena's father provided fewer correct responses on the post-test than on the pre-test (83.3% correct on the pretest, 66.7% correct on the posttest). Figure 10 provides pre and post test scores on the knowledge assessment by parent. Further, Appendix I provides an item-by-item table with each scoring decisions for each response.

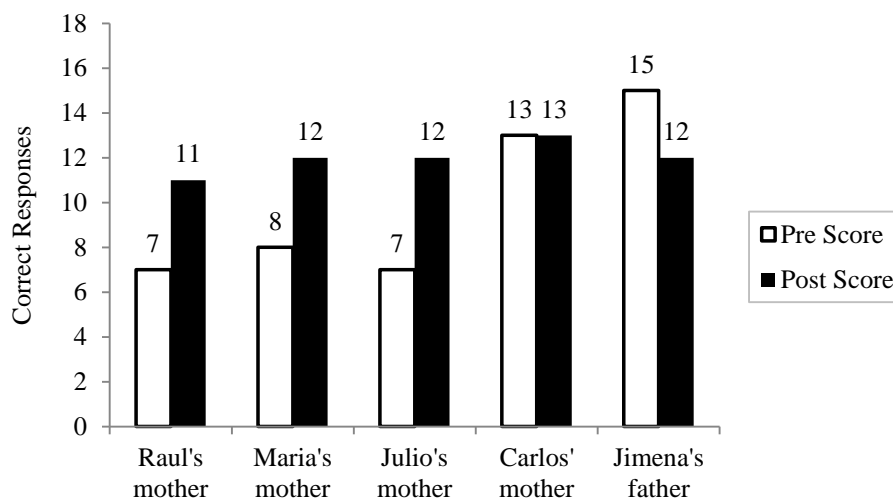


Figure 10. Parents' pre-test and post-test scores on the physical activity knowledge assessment.

**Implementation Question 5: What was the (child) participant's compliance level with wearing the accelerometer?** Data from the accelerometers enable an analysis of participant wear time. Raul, Maria, Carlos, and Jimena wore the accelerometer for 600 minutes (10 hours) or more for 81% – 100% of all days during baseline. Because of a device malfunction, Julio's data was not recorded during his first 7-day baseline probe, resulting in him wearing the device (for 600 minutes or more) only 42.8% of days during baseline. During his second 7-day probe in baseline, Julio wore his device (for 600 minutes or more) on 6 out of 7 days (85.7%). During the intervention condition, Raul, Carlos, and Maria wore the device (for 600 minutes or more) 85.7%, 90.5%, and 85.7% of assigned days, respectively. Daily wear time (for 600 minutes or more) was lower for Maria and Julio during the intervention condition because they each had a 7-day probe in which they entered a pool while wearing the device; this resulted in the accelerometer's data being lost for the week. Removing these weeks from consideration results in Maria meeting the 600 minutes or more of wear time per day 100% of the other days, and Julio meeting the wear time on 13 of 14 days (92.8%). Table 15 displays participant wear time (for 600 minutes or more per day) by condition.

Table 15

*Compliance Wearing the Accelerometer, by Participant During Baseline (BL) and Intervention (INT)*

Category	Raul		Maria		Julio		Carlos		Jimena	
	BL	INT	BL	INT	BL	INT	BL	INT	BL	INT
Days in condition	7	28	7	28	14	21	14	21	21	14
Days worn 600 minutes or more in condition	7	24	6	21	6	13	14	19	17	12
Percent of days worn 600 minutes or more	100.0	85.7	85.7	75.0	42.8	61.9	100.0	90.5	81.0	85.7

*Note.* BL = Baseline condition, INT = Intervention condition.

### **Aim 3: To examine the effects of the intervention on daily levels of moderate-to-vigorous physical activity among child participants**

Figure 11 present the average daily levels of moderate-to-vigorous physical activity for each child across session days (4-7 Metabolic Equivalents (METs)), which represent standard units of energy expenditure that enable a comparison of effort across diverse types of physical activities.). During baseline, the seven-day physical activity assessments for Raul and Maria revealed an average of 61.9 and 46.5 minutes of moderate-to-vigorous physical activity (MVPA) per day, respectively.

When the intervention was introduced the second week, average levels of MVPA increased for both participants. For Raul this was an increase in his daily average by 53.9 minutes per day (87.1%) – from a baseline daily average of 61.9 minutes of MVPA per day to a post-intervention daily average of 115.8 minutes of MVPA per day. For Maria this was an increase of 2.6 minutes per day (5.6%) – from a baseline average of 46.5 minutes of MVPA per day to a post-intervention average of 49.1 minutes of MVPA per day. Levels of MVPA for non-intervention participants remained steady. Carlos’ daily average level of MVPA increased by a daily average increase of 1.2 minutes per day (1.5%); Jimena’s daily average level of MVPA

decreased 7.2 minutes per day (-9.9%). Julio's data for week one was not available, due to a device malfunction.

When the intervention was introduced for Julio, in the third week, his daily average level of MVPA increased 14.4 minutes per day (22.4%), from a daily average of 64.2 minutes per day to 78.6 minutes of MVPA per day. Carlos' daily average level of MVPA from week 2 baseline to intervention decreased by 2.2 minutes per day (-2.7%). Jimena (who also remained in baseline) experienced larger decreases to her daily average level of MVPA - a decrease of 11.6 minutes per day (-17.6%).

The following week (week 4), the intervention was introduced for Jimena; her daily average level of MVPA increased by 16.3 minutes per day (30.1%) from 54.2 minutes per day during week 3 to 70.5 minutes per day in week 4. While four of the five participants experienced an increase in their daily average of MVPA from their final baseline week to intervention, all participants experienced a decrease in their average levels of MVPA from the second to last to their last week of the study. This decrease was largest for Jimena at a daily average decrease of 19.5 minutes per day (27.7%) and smallest for Raul at a daily average decrease of 3 minutes per day (2.8%).

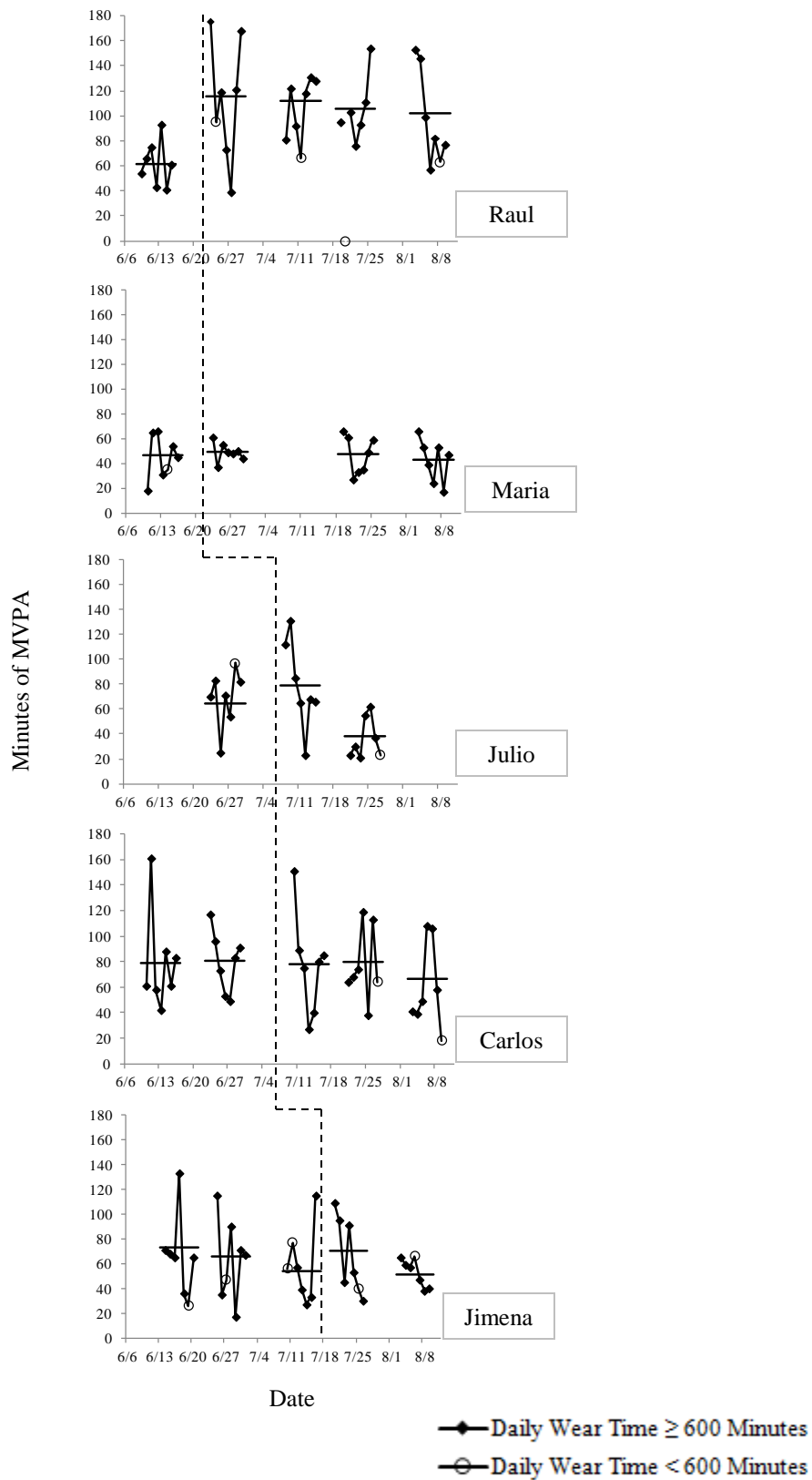


Figure 11. Daily Levels of Moderate-to-Vigorous Physical Activity from Pre to Post Intervention

**Aim 4: To determine satisfaction among children and parents who participate in the intervention**

At the last home visit, children answered two questions that assessed their satisfaction with the physical activities they did throughout the intervention. Two of the children (Raul and Maria) felt that they had “A little fun” when asked, “How much fun did you have this summer doing these physical activities (possible responses included: No fun, A little fun, or A lot of fun). Three of the children (Carlos, Maria, and Jimena) felt they had “A lot of fun” when asked this question. All five participants answered “Yes” when asked, “Do you want to keep doing these physical activities?” (Possible responses included, No, Maybe, or Yes).

Parents (four mothers, one father) rated their level of agreement with seventeen positive statements related to the physical activity intervention (e.g., “This program was helpful for my child to become more physically active.”). They responded to 17 positive statements on a 1 (Strongly Disagree) to 7 (Strongly Agree) scale; a rating of 4 represented “Neutral.” Table 16 provides the ratings for each item, by parent. Parents expressed strong levels of agreement with these positive statements. Across all 17 questions, parent’s level of agreement ranged from an average of 6.3 (Maria’s mother) to 6.8 (Carlos’ mother). In regards to individual questions, parents strongly agreed with most statements (6.0 – 7.0) for all items except one: “My child enjoys being physically active,” which received a mean rating of 5.2. Parents also rated their level of agreement with statements regarding the helpfulness of intervention components. Parents rated their level of agreement with statements related to: physical activity education, goal setting, behavioral contracting, and the report card. Across all five parents, agreement with statements related to the helpfulness of each component was high: 6.8 for the physical activity education,

6.6 for the goal setting component, 7.0 for the behavioral contract component, and 6.8 for the report card component.

Parents also provided ratings related to their level of agreement with statements relating to the ease of use related to the physical activity education, goal setting, behavioral contracting, and the report card. Across all five parents, agreement with statements related to the ease of use of each component was strong for the physical activity education (7.0), report card (6.8), and behavioral contract development and sticker provision (6.6 and 6.8, respectively). Agreement with ease of use statements related to the goal setting component was lower (5.8). Four of the five parents reported agreement to strong agreement with the statement, “Even though the program is over, I will keep setting goals for my child to be physically active,” while one parent was neutral.

Three of the five parents provided feedback to the open ended question at the end of the survey. One parent expressed an interest in a group-based component of the intervention, stating, “Some kids don’t have [a] brother or friends. So to do something in groups at least once a week would be good.” Another parent expressed an interest in having a follow up and review of concepts learned (the experimenter did make a brief phone call to her about two months after all data collection and other study procedures ended). Finally, one parent provided three suggestions for improvement: 1) facilitating this type of intervention during times of the year that are less hot, 2) extending the program length, and 3) including a diet component in the intervention. Although nutrition was not part of the intervention, parents were provided with a 1-page fact sheet on child nutrition at the conclusion of the intervention (U.S. Department of Agriculture & U.S. Department of Health and Human Services, 2011).

Table 16

*Parent Satisfaction with the Family-Based Intervention*

Item	Parent					Mean	SD
	Raul's Mother	Carlos' Mother	Maria's Mother	Julio's Mother	Jimena's Father		
1. I am <u>satisfied</u> with my child's current level of physical activity.	6	6	5	6	7	6.0	0.7
2. My child <u>enjoys</u> being physically active.	5	6	6	3	6	5.2	1.3
3. This program was <u>helpful</u> for my child to become more physically active.	7	7	7	7	7	7.0	0.0
4. The <u>physical activity education</u> part of the program was <u>helpful</u> .	7	7	7	7	6	6.8	0.4
5. The <u>physical activity education</u> part of the program was <u>easy to understand</u> .	7	7	7	7	7	7.0	0.0
6. The <u>goal setting</u> part of the program was <u>helpful</u> .	7	6	6	7	7	6.6	0.5
7. The <u>goal setting</u> part of the program was <u>easy to do</u> .	7	6	6	4	6	5.8	1.1
8. Even though the program is over, I will keep setting goals for my child to be physically active.	6	7	7	7	6	6.6	0.5
9. Even though the program is over, I will keep using the <u>goal setting</u> sheets.	4	7	7	6	7	6.2	1.3
10. The <u>behavioral contract</u> was <u>helpful</u> .	7	7	7	7	7	7.0	0.0
11. The <u>behavioral contract</u> was <u>easy to complete</u> .	7	7	6	7	6	6.6	0.5
12. <u>Providing stickers</u> for every 10 minutes of physical activity was <u>easy to do</u> .	7	7	7	7	6	6.8	0.4



13. The physical activity <u>report card</u> was helpful.	7	7	6	7	7	6.8	0.4
14. The physical activity <u>report card</u> was easy to understand.	7	7	7	7	7	7.0	0.0
15. The home <u>visits</u> were <u>helpful</u> .	7	7	7	7	7	7.0	0.0
16. I would <u>recommend</u> this program to other parents I know.	7	7	7	7	7	7.0	0.0
17. My child is <u>healthier</u> after participating in this program.	6	7	6	7	7	6.6	0.5
Participant mean	6.5	6.8	6.3	6.5	6.7		

Parents also indicated their general satisfaction in regards to their child's: 1) Diet and 2) The amount of physical activity/exercise that he/she gets each day. Parents had previously responded to these items during the initial screening (pre-intervention). Each parent's pre- and post-intervention rating was used to calculate a percent change:  $((\text{post-intervention rating} - \text{pre-intervention rating}) / \text{pre-intervention rating}) * 100$ . Across all five parents, the average percentage change for parent satisfaction with exercise/physical activity resulted in an increase of 156.7%, while the percentage change across all five parents for satisfaction with diet (not targeted by the intervention) was smaller (+62.0%). Satisfaction scores and pre/post scores for each item, by parent, are displayed in Table 17.

Table 17

*Percent Change in Satisfaction from Pre-intervention to Post-intervention (1 = Not at All, 5 = Somewhat, 10 = Very)*

Item	Parent					Average % Change
	Raul's Mother (Pre/post)	Carlos' Mother (Pre/post)	Maria's Mother (Pre/post)	Julio's Mother (Pre/post)	Jimena's Father (Pre/post)	

Child's Diet	0.0% (7/7)	+60.0% (5/8)	+50.0% (2/3)	+200.0% (1/3)	+0.0% (3/3)	+62.0%
Exercise/physical activity	+166.7% (3/8)	+33.3% (6/8)	+150.0% (2/5)	+400.0% (1/5)	+33.3% (6/8)	+156.7%

### Discussion

The intervention tested in the present study resulted in marked, sustained increases for only one of the participants – Raul. Although data from three other participants (Maria, Julio, Jimena) show small increases in average daily levels of physical activity in the week following the intervention, variability in daily levels of MVPA throughout baseline and intervention preclude inferences about the effectiveness of the intervention for these participants..

Raul experienced a large (87.1%) increase in his average daily level of moderate-to-vigorous physical activity (MVPA) following the implementation of the intervention; these increases were maintained over the course of the study period. A variety of factors may explain the sustained increase in MVPA for Raul. He had the highest overall home environment score on the Physical Activity and Media Inventory. The Physical Activity Resources Assessment also indicated that he had the most physical activity resources within a half mile from his home; his mother reported using two parks every 14 days, which was more park use than any other participant. She also reported facilitating more indoor physical activity than any other parent and more family-based physical activity than other participant parents. This involved Raul being active with both his older sister and his father (in addition to his mother).

No comparable effects were seen with the other participants. For some participants, this might be explained by a failure of implementation. For instance, accelerometer data suggests parental inconsistency in the provision of stickers contingent upon physical activity. Other

plausible explanations of no effects include differences in home and neighborhood environments and differences with family support for physical activity.

When interpreting the small magnitude of effects (with Raul) in this study, other study results should be considered. Large physical activity intervention studies involving children and youth have typically observed minimal changes in activity levels (e.g., 1.6 more minute of physical activity per day among intervention participants versus control participants (Webber et al., 2008); no difference in physical activity between treatment and intervention groups (Klesges et al., 2010; Robinson et al., 2010). For the participants in the present study, increases in physical activity from baseline to intervention ranged from an increase in average daily levels from 2.6 minutes per day to 53.9 minutes per day for four of the five participants.

During the final 7-day assessment, physical activity levels decreased for all participants. All five parents reported the weather being a barrier for being more physically active during the final week of the intervention (August). Heat Index readings from a nearby National Weather Service station were reviewed for daily readings taken at 11:54 AM (Weather Underground, 2011). Heat Index determines what the temperature feels like, accounting for both temperature and relative humidity (Ahrens, 2007). Heat indexes between 90 to 105 can result in sunstrokes, heat cramps, and heat exhaustion during prolonged bouts of physical activity. For Raul, Maria, Carlos, and Jimena, the Heat Index actually decreased from their second-to-last week to their final week (from a Heat Index of approximately 99 to 93, respectively). Regardless, a Heat Index of approximately 93 still presents health risks with prolonged bouts of outdoor physical activity.

For Julio (who did not have accelerometer data for the fifth week), there was an increase in the Heat Index from his third to fourth week of valid accelerometer data (from a Heat Index of 94.1 to 99.2, respectively), which may have contributed to his marked decrease in daily physical

activity. Further, Julio's family moved just before his final 7-day accelerometer assessment (week 4). Julio's mother reported that it was challenging to find time to be active with him. The PARA data show that Julio's mother had not accessed any physical activity resources in his new neighborhood. Further research should clarify whether family mobility is a risk factor for physical inactivity.

The satisfaction survey data showed that parents approved of the intervention. Parents also reported that the intervention components were easy to implement. At the conclusion of the intervention, parents were able to set daily physical activity goals, and to develop and facilitate behavioral contracts. Parents were also more knowledgeable about physical activity. Only one parent – Jimena's father – scored lower on the "Physical Activity Guidelines" post-test. Because of the staggered introduction of the intervention, Jimena received the intervention later than any other participant, and her father did not receive a review of the guidelines as other parents did.

Parents were not able to reinforce the accumulation of ten minutes of physical activity with consistency. Future studies should focus the intervention on affecting parent behavior. This would include training parents to accurately and consistently reinforce physical activity in practice sessions. Further, it could focus on providing training to help parents be physically active with their children through active play.

This study has a few limitations. One limitation was the study's subject generality; there was a small number of participants ( $N = 5$ ). Future research that involves these intervention components should test this intervention on larger participant samples. Previous studies have validated procedures for imputing missing accelerometer data; however these procedures are typically used with large groups of youth (Catellier et al., 2005). Thus, visual interpretation of moderate-to-vigorous physical activity trend data involved missing data. Future research that

involves testing these intervention components on larger participant samples should also consider the best approach to handling missing data.

Participants were obese (BMI  $\leq$  97<sup>th</sup> percentile) Latino children who were selected based on their unhealthy weight and their parents' interest in increasing their child's physical activity. Thus, generality to children of other racial and ethnic groups may be limited. The feasibility of this intervention's implementation is uncertain if the parent does not perceive physical inactivity (or weight) as a problem for his or her child. So, this intervention may require some level of parental commitment, which would make it more suitable as a targeted intervention (rather than a universal intervention for all children regardless of weight). Although children in the present study were obese (BMI  $\geq$  97<sup>th</sup> percentile), their baseline level of physical activity was fairly high. Future studies should consider using accelerometer-based assessments (rather than questionnaires) to identify children who engage in very low levels of physical activity. Perhaps the higher levels of physical activity are limited to summer months in which children have more free time.

Another limitation of this study was its short duration (approximately 10 weeks). This period – summer vacation – was chosen because it provided an extended period of time, in which children and parents spent most of their day together. Further, the summertime intervention limited required physical activity, such as school gym class, enabling a clearer examination of the intervention's effects. However, many studies that promote physical activity in community settings are significantly longer, often up to a year (McNeil et al., 2009; Savoye et al., 2007). Hence, physiological changes (e.g., changes in BMI, insulin resistance) related to increased levels of physical activity over extended periods of time were not examined. Longer studies would also enable a more robust visual analysis of trend data, which would help determine if

decreases in the later weeks of the intervention were due to the heat (or another variable). Other adverse weather conditions (i.e., cold weather) would also likely present barriers to outdoor physical activity. Home-based interventions that can be implemented in any type of weather that occurs throughout the year should be developed.

Despite these limitations, this study has a number of strengths. The study examined a targeted, parent-implemented intervention among an at-risk ethnic/racial group – Latino children. The study was implemented in a naturalistic setting – the participant’s home and community. The study involved the use of two validated instruments (the Physical Activity and Media Inventory and the Physical Activity Resource Assessment) to examine the context in which the child and parent live and play.

The primary dependent variable – daily minutes of moderate-to-vigorous physical activity – was assessed using an objective, validated measurement approach. Daily measurements were extensive – typically, ten hours per day – capturing up to five weeks of the participant’s physical activity during the summer. The independent variable – the parent-implemented intervention – addressed multiple barriers to physical activity through goal setting, behavioral contracting, and reinforcement of physical activity behaviors. Further, permanent products such as the goal sheets and behavioral contracts that emerged from participation in the intervention enabled an examination of behaviors related to physical activity. Because parents were trained to facilitate this intervention, it has a greater chance of sustainability than studies that use trained professionals to promote physical activity (McCormick, Ramirez, Caldwell, Ripley, & Wilkey, 2008; Melnyk et al., 2007; Neumark-Sztainer et al., 2003). The possibility of sustainability was supported by parents’ high level of satisfaction related to continuing the intervention components after the intervention ends.

Future studies should involve more controlled experiments that would rule out potential confounding variables such as the heat. The efficacy of the intervention could be examined in smaller periods of time, in conditions that do not involve hot/humid weather. For example, this might involve sessions indoors, where children are asked to be active; parents would set activity goals for them, and children could earn reinforcers for their activity. Once a clearer relationship is established between the intervention and physical activity, this approach should be replicated. With Latino populations, this would involve replicating the experiment with larger groups. To enhance the limited generality of this small sample ( $N = 5$ ), future studies might test interventions within randomized control trials from larger groups of children experiencing health disparities. Further, alternative delivery mechanisms for the intervention should be considered if this experiment is replicated in the future. For example, there is evidence that community health workers – specifically Promotores de Salud (in the Latino community) – may be effective at delivering home-based interventions. Replications of this intervention might also be tested using computerized delivery. This would enable even larger groups, and if this is shown to be effective, it could be more widely implemented. Further, if the decrease in physical activity is found consistently, perhaps groups that provide social support could help participants maintain their physical activity levels. This intervention should also be replicated with non-Latino populations; this would enable a fuller assessment of generality with other populations experiencing health disparities. Additionally, more comprehensive interventions focused on both physical activity and nutrition may better address the imbalance of energy that obese youth face.

## **Conclusion**

### **Study Findings**

This dissertation study examined the effects of two interventions related to the Latino Health for All Coalition's action plan to promote physical activity in Kansas City. Study 1 was a universal intervention, presenting Latino children and youth (aged 5 to 15) in Kansas City (regardless of weight) with an opportunity to be physically active in 8 structured soccer sessions at a local park. These soccer sessions focused on skill building and recreation, rather than competition. Results of this study showed that it attracted its target population – Latino youth including those at risk for chronic disease associated with overweight and obesity. The program enabled participants to accumulate approximately 20 minutes of moderate-to-vigorous physical activity – about a third of the daily recommended amount – in only about one hour. It also showed that parents and child/adolescent participants felt this was a satisfactory way to be physically active. This naturalistic study showed similar attendance rates across gender and BMI category. Child/adolescent participants and parents expressed high levels of satisfaction at the end of the program. Further, the program was replicated, and it attracted similar participants (with respect to age and gender) and earned similarly high levels of satisfaction.

Study 2 was a targeted parent-implemented intervention with the aim of enabling five obese youth to become more physically active. This study involved a home-based intervention that involved health education, goal setting, behavioral contracting, and parental reinforcement of physical activity. The main outcome of this study showed immediate increases in the daily level of moderate-to-vigorous physical activity (MVPA) for four out of five participants, following the implementation of the intervention. However, increases in daily MVPA were not maintained throughout the intervention period. Process data related to implementation show that parents: 1) learned key information related to the physical activity guidelines for children and



adolescents, 2) could set daily goals to be physically active with their children, and 3) could develop and carry out behavioral contracts.

Targeting children and youth most at risk for conditions associated with physical inactivity, as done in Study 2, is a promising approach to promoting physical activity among children of unhealthy weight. However, a universal approach that offers opportunities for all Latino children and youth (underweight, healthy weight, normal weight, overweight/obese) to be physically active may also be important to the public's health. The Institute of Medicine (2003) has described this as a population perspective. This involves asking why a particular population, such as Latinos or African Americans, has a particular distribution of risk, relative to other groups. Further, it involves addressing risk that lies outside the extremes, which is where most (potential) cases of any particular disease (i.e., diabetes, cardiovascular disease) occur. This approach is vital to assuring the health of a population (rather than just a small number of at-risk individuals).

Another question for consideration is the ideal mix between structured physical activity and unstructured physical activity. Participants in Study 1 accumulated about 20 minutes of moderate-to-vigorous physical activity in a one-hour session. Participants in Study 2 accumulated physical activity throughout the day. If Study 2 participants also had just one or two opportunities to accumulate physical activity in similar structured sessions, this may have made a meaningful contribution to their overall levels of MVPA.

### **Coalition Progress in Assuring Coalitions for Physical Activity**

The Latino Health for All Coalition began its work in November 2008 with the development of a community-determined action plan. By November 2011 – three years into the project – the coalition's physical activity committee has partnered with a diverse group of key

stakeholders. Fifty-three individuals representing 26 organizations have attended at least one of the physical activity committee’s monthly meetings. These individuals represent a variety of sectors including local government (e.g., parks and recreation), community-based agencies (e.g., a local youth-serving organization), and educational institutions (e.g., an obesity research/treatment center). Six members of the community and four university students (not representing an agency or organization) have also participated in the physical activity committee’s monthly meetings.

In addition to multi-sector participation, the physical activity committee has also helped the Latino Health for All Coalition fund and implement 11 “mini-grants” to local organizations. These “mini-grant” funds are awarded to local agencies that can help address the coalition’s action plan. These grants have ranged from approximately \$1,500 to \$10,000. All seven prioritized strategies for change on the coalition’s action plan have been addressed by one or more grants. These grants include programs that offer physical activity information, programs that offer leisure-time physical activity, and modifications to local conditions to enable recreational physical activity. Table 18 lists each priority strategy and the corresponding “mini-grant(s)” that address the strategy.

Table 18

*Latino Health for All Mini-grants Related to Each Priority Strategy for Promoting Physical Activity*

Priority Strategy	Example “Mini-grant” that Addresses this Strategy
1. Modify community practices to increase access to facilities that will enable community residents to be more physically active.	“Kids Get Fit Afterschool” – Provision of free passes to the YMCA facility on the weekends for youth and their parents.
2. Implement Latin dance clubs/tournaments that will promote physical activity through dance.	“Salon de Baile” – Create opportunities for local families to participate in Latin dance and receive health information.

3. Establish programs that educate community residents about physical activity (similar to the lay health advisor Promotoras model).	“Family-based Intervention to Promote Physical Activity (Study 2)” - health education, goal setting, behavioral contracting, and parental reinforcement of physical activity
4. Establish programs that educate professionals about assuring physical activity in their patients.	“Photovoice” – Community residents photograph their environment related to physical activity and nutrition and present results to the Latino Health for All Coalition.
5. Establish community conditions that enable residents to engage in regular forms of leisure physical activity.	“Zumba” – Ongoing Zumba classes offered to adults in the community – free of charge.
6. Modify softball fields (and other public field space) to enable community residents to play soccer.	“8 <sup>th</sup> Street Park Project” – Modify an open space at a local park by installing soccer goals, fencing, and a scoreboard to enable residents to play soccer.
7. Implement soccer tournaments that will promote physical activity.	“Structured Soccer Sessions (Study 1)” – Weekly soccer drills and games offered to youth in a local park.

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### **Overall Strengths and Limitations**

Although this dissertation provides an in-depth evaluation of two diverse intervention efforts related to the Latino Health for All Coalition’s action plan, it does not examine the overall effect of the coalition’s efforts to promote physical activity. Brownson et al. (1996) provided community-level data that enabled an assessment of the Bootheel Heart Health Project’s coalition-based effect on communities throughout the state. This involved the use of the Centers for Disease Control’s Behavioral Risk Factor Surveillance System Survey (BRFSS), which enabled the coalition to examine the difference in leisure time physical activity among residents who live in counties with an active coalition versus residents who live in counties without an active coalition. The Latino Health for All Coalition has implemented a similar approach to understanding the community-wide effects of the coalition’s efforts to prevent and address cardiovascular disease and diabetes. This has also involved conducting the CDC’s BRFSS survey in target communities and comparison communities (that the coalition has not targeted in

its intervention efforts). However, the multi-year survey is underway and the results of this longitudinal study are not yet available.

An overall strength of this dissertation was the empirical examination of the coalition at multiple ecological levels. This dissertation study involved assessment or intervention across three of the five ecological levels (interpersonal factors, interpersonal processes and primary groups, institutional factors, community factors, and public policy) identified by McLeroy et al. (1988). The Physical Activity Resource Assessment (PARA) examined community factors (physical activity resources such as parks and community centers) available for physical activity which influences health. In Study 1, the structured soccer sessions served as a mediating structure within the community for youth to be physically active. The behavioral intervention in Study 2 focused primarily on interpersonal factors; for example, increasing parents' knowledge about the physical activity guidelines and increasing the child's "intention to comply" (McLeroy et al., 1988, p. 365) with physical activity goals through the provision of stickers that would enable access to reinforcers.

Interpersonal processes and primary groups – namely the primary care-giving parent – served as an integral part of the intervention in Study 2. Because the study focused on home settings, targeting summer vacation – a time with children would be most likely to spend little time in organizational settings, such as school – no efforts were made to assess organizational factors or to intervene on organizational factors. Public policy factors likely affected physical activity behavior; for example Maria's mother reported unleashed dogs prevented her and her family from walking certain places and Julio's mother reported a lack of sidewalks as being a barrier to walking. These broader environmental barriers may be more prevalent in low-income communities experiencing health disparities; they may also be a function of differential

community public policies (e.g., animal control policies, city ordinances related to infrastructure). However, the intervention in neither study addressed these types of moderating factors.

## **Conclusion**

This dissertation consisted of two nested studies within a community coalition effort to change conditions affecting physical activity and risk for chronic disease. The Latino Health for All Coalition has facilitated changes in the community that affect physical activity. It began with collaboration across a variety of agencies – including two university units (a behavioral science department and a preventive medicine department) and a community partner (El Centro, Inc.). The coalition also involved collaboration among a diverse group of Latino-serving organizations. It has been both inclusive and participatory, allowing anyone with an interest in addressing risk for cardiovascular disease and diabetes to attend the monthly coalition meeting and apply for a “mini-grant.” The initial action plan that the coalition established focused the work of this diverse group of leaders in changing the conditions related to physical inactivity in the community. Further, the Latino Health for All Coalition has enabled community leaders with unique skills and competencies to lead the coalition, help evaluate “mini-grant” proposals for funding, and develop individual intervention projects with autonomy. The coalition has also held leaders of the mini-grant projects accountable for results by requiring attendance at the monthly meeting, the submission of written “mini-grant” proposals, and posed a requirement that all mini-grant recipients submit a mid-project and end of project written report.

In conclusion, physical inactivity presents a complex problem at a variety of ecological levels – from the individual level to the policy level. To improve health behaviors (and ultimately health), a variety of efforts – both targeted and universal – are crucial. Under the right conditions, multi-sector health coalitions can generate a variety of preventive intervention

efforts, across a variety of ecological levels, to address risk for chronic diseases among populations experiencing health disparities. Efforts like these are important to address the health disparities that low-income ethnic and racial groups (such as Latinos) face and assure the health and well-being for all members of the community.

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## Appendix A

**Want to Learn Soccer Skills?****(En español al otro lado de la hoja)****Latino Health for All Youth Soccer****Sign up for 8 weeks of soccer instruction & small sided games (3 vs. 3)****Every Wednesday night from June 9<sup>th</sup> - July 28<sup>th</sup>****At****Age Groups (Girls & Boys):**

6 - 9 years old: 5:30 PM to 6:30 PM

10 - 12 years old: 6:45 to 7:45 PM

13-15 years old: 8:00 - 9:00 PM

Parents: Get certified as a coach for free

**Cost:** \$20.00 (per child) for all 8 weeks  
(If eligible, scholarships may be available)

Register & pay 30 minutes before your age group begins on Wednesday nights (June 9 - July 28)  
 There is a limit of 50 participants in each age group, those who register and pay first receive priority  
 A parent/legal guardian must register their child (children can NOT register themselves)

The first 50 participants to register in each age group get a free water bottle  
 Participants who attend at least 6 out of 8 weeks receive a free ticket to a Kansas City Wizards home game on July 31<sup>st</sup>  
 Participants will have the opportunity to meet a Wizards Player at one of the sessions

To apply for a scholarship or if you are interested in being certified as a coach:  
 Log onto <http://kclatinohealth.org> (sign-up link at the top, right)

For more information, or if you do not have internet access, call Dan Schober (785)  
 Or Blanca Mendoza (913)

(English)

(Spanish)

<http://kclatinohealth.org><http://www.kcksoccer.org><http://www.kcwizards.com>[http://mlsnet.com/mls\\_works](http://mlsnet.com/mls_works)

## Appendix B



<http://kclatinohealth.org>



<http://www.kcksoccer.org>



<http://www.kcwizards.com>



[http://mlsnet.com/mls\\_works](http://mlsnet.com/mls_works)

## Latino Health for All Youth Soccer Sign-Up Form

To register for "Latino Health for All Youth Soccer," a parent or guardian of the participating child should complete this form. Your responses on this form will be kept confidential.

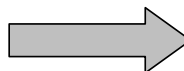
Please pay on Wednesday, June 9<sup>th</sup>, before soccer begins – \$20.00 – cash, check, or money order only. There is a limit of 50 participants in each age group (6-9, 10-12, and 13-15 years old). Participants who register AND pay first receive priority.

Latino Health for All Youth Soccer will be held every Wednesday from June 9 to July 28 at Leo Alvey Park (Metropolitan Ave & S 49th St). For more information, please contact Dan Schober at (785) 550-1892 (English) or Blanca Mendoza (913) 439-9349 (Spanish).

### CHILD INFORMATION


1) Child's First Name: _____	2) Child's Middle Initial: _____
3) Child's Last Name: _____	4) Child's Gender (Circle One): A) Male B) Female
5) Child's Birthday (Month/Day/Year): ____/____/____	6) Most Recent Grade in School <u>COMPLETED</u> : _____
7) Child's E-mail Address: _____	8) Is your child of Hispanic, Latino, or Spanish Origin? (Circle One): A) No, not of Hispanic, Latino or Spanish origin B) Yes, Mexican, Mexican Am., Chicano C) Yes, Puerto Rican D) Yes, Cuban E) Yes, another Hispanic, Latino, or Spanish origin (Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.)

**APPLICATION CONTINUES ON NEXT PAGE**

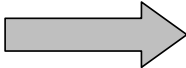




## Appendix B (continued)

<b>PARENT INFORMATION</b>	
9) Mother's First Name: _____	10) Mother's Last Name: _____
11) Mother's Phone Number: _____ - _____ - _____	12) Mother's Phone Number Is - (Circle One): A) Home B) Cell C) Work D) Other
13) Father's First Name: _____	14) Father's Last Name: _____
15) Father's Phone Number: _____ - _____ - _____	16) Father's Phone Number Is - (Circle One): A) Home B) Cell C) Work D) Other
<b>HOME INFORMATION</b>	
17) Child's Street Address: _____	18) Child's Apartment Number: _____ (If Not Applicable, Leave Blank)
19) Child's City: _____	20) Child's State (Circle One): A) Kansas B) Missouri
21) Child's Zip Code: _____	22) Language(s) Spoken in the Home (Circle One): A) Only Spanish B) Spanish better than English C) Both equally D) English better than Spanish E) Only English
<b>EMERGENCY CONTACT INFORMATION</b>	
23) Emergency Contact First Name: _____	24) Emergency Contact Last Name: _____
25) Emergency Contact Phone Number: _____ - _____ - _____	26) Doctor To Notify In Emergency – First Name: _____
27) Doctor To Notify In Emergency – Last Name: _____	28) Doctor Phone Number: _____ - _____ - _____
<b>APPLICATION CONTINUES ON NEXT PAGE</b> 	
# _____	

## Appendix B (continued)

<b>CHILD HEALTH</b>	
29) How many prior seasons has your child played organized soccer? _____	30) During the past 7 days, on how many days was your child physically active for a total of at least 60 minutes per day?  (Add up all the time he/she spent in any kind of physical activity that increased his/her heart rate and made him/her breathe hard some of the time.)  (Circle One): Days = 0    1    2    3    4    5    6    7
31) Child's Height (Circle One for Feet & One for Inches): Feet    =    3    4    5    6 Inches = 0 1 2 3 4 5 6 7 8 9 10 11 12	32) Child's Weight: _____ Pounds
33) Please describe any health conditions that affect your child: _____ _____	
<b>OTHER INFORMATION</b>	
34) Can we contact you for a KU research study related to helping Latino youth get more exercise and improve their health?  Your answer will NOT affect whether your child can play in the league, whether you are selected to be certified as a coach (if you are interested), or whether you will receive a scholarship. (Circle One): A) Yes, you may contact me B) No, please do not contact me	35) How did you find out about Latino Health for All Youth Soccer?  (Circle One): A) Flyer B) Word of Mouth C) Other
<b>APPLICATION CONTINUES ON NEXT PAGE</b> 	
# _____	

## Appendix B (continued)

**PARENT GUARDIAN CONSENT**

I, the parent/guardian of the registrant, a minor, agree that I and the registrant will abide by the rules of the US Youth Soccer, its affiliated organizations and sponsors. Recognizing the possibility of physical injury associated with soccer and in consideration for the US Youth Soccer accepting the registrant for its soccer programs and activities ("the programs"), I hereby release, discharge and/or otherwise indemnify US Youth Soccer, its affiliated organizations and sponsors, their employees and associated personnel, including the owners of fields and facilities utilized for the Programs, against any claim by or on behalf of the registrant as a result of the registrant's participation in the Programs and/or being transported to or from the same, which transportation I hereby authorize. As the parent or legal guardian of the above-named player, I hereby give consent for emergency medical care prescribed by a duly licensed Doctor of Medicine or Doctor of Dentistry. This care may be given under whatever conditions are necessary to preserve the life, limb or well-being of my dependent.

36) Parent/Legal Guardian – Print Name: \_\_\_\_\_

37) Parent/Legal Guardian – Signature: \_\_\_\_\_



## Appendix D



(In English on the other side of this page)

Regular physical activity has a variety of benefits for children that include improved muscular fitness, body composition, and bone health. Children (ages 6 to 18) should get 1 hour or more of physical activity every day (mostly moderate or vigorous intensity). Here are some ways for your children to meet recommended levels of physical activity.

### Soccer Leagues:

League:	Phone / Website:	Registration Deadline (2010):		Cost for Recreational League:	Notes:
		Premier	Recreational		
<b>KCK Soccer Association (KCKSA)</b> Jose Zarate, President P.O. Box 6066 Kansas City, KS 66106	(816) 804-9931 (Cell) <a href="http://www.kcksoccer.org">www.kcksoccer.org</a>	July 10	Sept 7	6 – 8 Years Old: \$40 9 – 14 Years Old: \$45	The premier league plays at either Western Missouri League or Heritage Park. A soccer academy (Academia de Fútbol) is also offered for children age 3 & older. The recreational league plays at Leo Alvey Park.
<b>Shawnee Soccer Club (SSC)</b> Phil Crosley, President P.O. Box 3184 Shawnee, KS 66203	(913) 432-2250 (Office) <a href="http://www.shawneesoccer.org">www.shawneesoccer.org</a>	July 10	July 10	\$65	The premier league plays at Heritage Park. The recreational league plays at Stump Park. Also available: Kohl's Recreational Tournament Camp.
<b>Northeast United Soccer (NEU)</b> Pat Monaghan, President 3008 W. 48th Street Shawnee Mission, KS 66205	(913) 735-6381 (Home) <a href="http://www.neusoccer.org">www.neusoccer.org</a>	July 10	Aug 2	Contact league for cost	The premier league plays at Heritage Park, teams available for Pre-Kindergarten to Kindergarten and age 9 & older. The recreational league plays at Heritage Park.
<b>Southwest United Soccer (SWU)</b> Nick Disidore, President 11944 W. 95th Street, #150 Lenexa, KS 66215	<a href="http://www.swusc.org">www.swusc.org</a>	July 10	Not Applicable	Contact league for cost	The premier league plays at Heritage Park. Recreational and age 9 & older play at Heritage Park.
<b>Kansas Rush Soccer Club</b> Mike Pelger, President 1499 E. 151st Street Olathe, KS 66062	(913) 764-4111 (Office) (913) 829-4712 (Home) <a href="http://www.kansasrush.com">www.kansasrush.com</a>	July 10	Aug	\$55 - \$80	The premier league plays at Heritage Park and/or Lone Elm Fields. Also available: soccer academies, camps, and tournaments.
<b>Ligi De Futbol Iberolatina (LIFI)</b> Juan Manual Rodriguez, President	(816) 645-8964 (Office)	Contact league for deadline	Contact league for deadline	Contact league for cost	
<b>Blue Valley Soccer Club (BVSC)</b> 13700 Switzer Road Overland Park, KS 66221	(913) 685-2872 (Office) <a href="http://bvssoccer.org">http://bvssoccer.org</a>	July 10	Not Applicable	Contact league for cost	The premier league plays at Heritage Park and/or Overland Park Complex. Also available: soccer academies, camps, and tournaments.
<b>Missouri Youth Soccer Association</b>	(636) 936-3676 <a href="http://www.mysa.org/index.php?option=com_content&amp;view=article&amp;id=287&amp;Itemid=159">http://www.mysa.org/index.php?option=com_content&amp;view=article&amp;id=287&amp;Itemid=159</a>	Contact league for deadline	Contact league for deadline	Contact league for cost	

## Appendix D (continued)

(In English on the other side of this page)

**Online Soccer Resources:**

Here are some ways to keep your children's soccer skills sharp.

<b>Website Category:</b>	<b>Website Address:</b>
Coaching Soccer	<a href="http://www.coachingsoccer101.com/">http://www.coachingsoccer101.com/</a>
Coach's Manual: Teaching the Basics	<a href="http://www.ucs.mun.ca/~dgraham/manual/Pages/basics.html">http://www.ucs.mun.ca/~dgraham/manual/Pages/basics.html</a>
Soccer-for-Parents	<a href="http://www.soccer-for-parents.com/index.html">http://www.soccer-for-parents.com/index.html</a>
Soccer Trainer (In Spanish)	<a href="http://www.soccer-trainer.es/Presentacion_programa_futbol_palabras.html">http://www.soccer-trainer.es/Presentacion_programa_futbol_palabras.html</a>
Just Soccer Drills	<a href="http://www.justsoccerdrills.com/Soccerdrillspage.html">http://www.justsoccerdrills.com/Soccerdrillspage.html</a>

**Other Ways to Stay Physically Active:**

Here are a few opportunities to stay active through Wyandotte County Parks and Recreation. Sports are typically open to boys and girls, ranging from ages 4 to 15. Programs for adults are also available. Cost is typically \$15 per season (except golf and swimming). For more information contact Wyandotte county Parks and Recreation at (914) 573-8358 or online at: [http://www.wycokck.org/Dept.aspx?id=17686&menu\\_id=1016&banner=15284](http://www.wycokck.org/Dept.aspx?id=17686&menu_id=1016&banner=15284)

**Fall:**

<b>Youth Flag Football</b> Registration: Begins in July Season: Begins in September	<b>Youth Soccer</b> Registration: Begins in July Season: Begins in September	<b>Youth Volleyball</b> Registration: Begins in July Season: Begins in September
---	--	--

**Winter:**

<b>Youth Basketball</b> Registration: November Season: Begins late January
--

**Spring:**

<b>Youth Co-Ed Soccer</b> Registration: Deadline in March Season: Begins April, runs six weeks	<b>Youth Co-Ed Kickball</b> Registration: Deadline in March Season: Begins in April	<b>Youth Golf</b> Season: Begins in April
--	---	--

**Summer:**

<b>Youth Softball</b> Registration: Deadline in May Season: Begins in June	<b>Youth Softball /Baseball (Competitive)</b> Contact: Cle Ross at (913) 980-4273	<b>Youth Basketball</b> Registration: Deadline in May Season: Begins June
<b>Youth Golf</b> Season: Begins in June Contact: Sunflower Hills Golf Course (913) 573-8570	<b>Youth Swimming</b> Season: June – July	

If you are interested in competitive basketball, contact Jay Lopez of the KC Knights at 816-716-4365 (<http://leaguelineup.com/welcome.asp?cmenuid=1&url=kcknightssports&sid=809109351>). If you are from Johnson County, there are opportunities for physical activity at Johnson County Park & Recreation District - (913) 438-7275 (<http://jcprd.com/>) and in Jackson County at Jackson County Parks & Recreation - (816) 503-4800 (<http://www.jacksongov.org/recreation/>)

**General Contact Information:**

If you have any questions or are not able to find the information you need to stay physically active, please contact the Latino Health for All Coalition - Dan Schober (785) 550-1892 (English) or Blanca Mendoza (913) 439-9349 (Spanish).

## Appendix E

## Participate in a Fun Physical Activity Study

This study involves helping children (6-9 yrs. old) and parents become more physically active, through fun, leisure-based physical activities that you choose

The study will begin and end this summer; it involves brief, weekly home visits  
(At a time convenient for you)



To be eligible, child and parent participants should:

- Be Hispanic/Latino (speak at least conversational English)
- Reside in the 66101 zip code (or nearby)
- Child: inactive/overweight, but otherwise healthy

Participants will be paid for their time & commitment to this study

Contact: Dan Schober  
(785) 550-1892 (Mobile)  
[dschober@ku.edu](mailto:dschober@ku.edu)



## Appendix F

**Child Information**

- 1.) Does your child have a regular family doctor?  
 No  
 Yes
- 2.) When was your child's last physical exam by a doctor?  
 Month: \_\_\_\_\_ Year: \_\_\_\_\_
- 3.) What time does your child typically wake up?  
 Weekdays (Mon. – Fri.): \_\_\_\_\_  
 Weekends (Sat. & Sun.): \_\_\_\_\_
- 4.) What time does your child typically go to bed?  
 Weekdays (Mon. – Fri.): \_\_\_\_\_  
 Weekends (Sat. & Sun.): \_\_\_\_\_

**Parent / Guardian Information**

- 5.) What is your relationship to the child participant in this study?  
 Relationship: \_\_\_\_\_
- 6.) Who is primary caregiver for the child participant in this study?  
Primary caregiver: \_\_\_\_\_
- 7.) What is the highest grade or year of school you completed?  
 Never attended school or only attended kindergarten  
 Grades 1 through 8 (Elementary)  
 Grades 9 through 11 (Some high school)  
 Grade 12 or GED (High school graduate)  
 College: 1 year to 3 years (Some college or technical school)  
 College: 4 years or more (College graduate)  
 Master's degree or above

Please continue on next page



## Appendix F (continued)

8.) What is your marital status?

- Never married
- Married (first time)
- Married (second time)
- Separated
- Divorced
- Widowed

9.) If you are married or live with a partner, what is his/her highest grade or year of school you completed?

(If you are **NOT** married or do **NOT** live with your partner, skip this question.)

- Never attended school or only attended kindergarten
- Grades 1 through 8 (Elementary)
- Grades 9 through 11 (Some high school)
- Grade 12 or GED (High school graduate)
- College: 1 year to 3 years (Some college or technical school)
- College: 4 years or more (College graduate)
- Master's degree or above

10.) What language do you usually speak in your home?

- Only Spanish
- Spanish better than English
- Both equally
- English better than Spanish
- Only English

**Home Information**

11.) What type of residence do you live in?

- Single family house
- Multi-family house
- Apartment
- Condominium/townhouse
- Other: \_\_\_\_\_

12.) Do you own or rent your home?

- Own
- Rent

Please continue on next page

## Appendix F (continued)

13.) How many months have you lived at this location for?

Number of Months: \_\_\_\_\_

14.) Throughout a typical year, do you spend 15 days or more living at another location?

No

Yes

15.) How many adults (over the age of 18) are living in the home?

1 biological parent

2 biological parents

1 biological parent and partner

2 parents with extended family

1 biological parent & current partner

Other: \_\_\_\_\_

16.) How many children live in this home, and what are their ages and genders:

No other children live in this house

Yes, there are other children live in this house (indicate

below):

Child 1

Age: \_\_\_\_\_

Male

Female

Child 2

Age: \_\_\_\_\_

Male

Female

Child 3

Age: \_\_\_\_\_

Male

Female

Child 4

Age: \_\_\_\_\_

Male

Female

Child 5

Age: \_\_\_\_\_

Male

Female

Child 6

Age: \_\_\_\_\_

Male

Female

Child 7

Age: \_\_\_\_\_

Male

Female

Child 8

Age: \_\_\_\_\_

Male

Female

17.) What is the combined income of you and your spouse or partner?

Less than \$10,000 per year

\$10,001 - \$34,999

\$35,000 - \$49,999

\$50,000 - \$74,999

\$75,000 or more

Please continue on next page

## Appendix F (continued)

18.) If there are any other adults (other than you and your spouse) who live in the house, what is their combined income?

(If there are not any other adults living in this house SKIP TO QUESTION 19)

- Less than \$10,000 per year  
 \$10,000 - \$34,999  
 \$35,000 - \$49,999  
 \$50,000 - \$74,999  
 \$75,000 or more

19.) Does your child receive free or reduced lunch?

- No  
 Yes  
 Don't know

**Work Information**

20.) What is your job/occupation?

Job/occupation: \_\_\_\_\_

21.) How many hours per week do you work?

Hours per week: \_\_\_\_\_

22.) What shift(s) do you typically work / what is your typical work schedule?

23.) Is there typically a change in your work schedule throughout the year?

- No  
 Yes, typical pattern: \_\_\_\_\_

24.) Do you consider yourself the head of the household?

- No  
 Yes

25.) If you are married or live with a partner, what is his or her occupation?

Job/occupation: \_\_\_\_\_

**End of survey, thank you!**

## Appendix G

**Parks**

Please indicate how often you go to these PARKS, with your child, in your free/leisure time:

Resource Name	Location	Never	Once a month or less (every 30 days or less often)	Once every other week (every 14 days)	Once a week or more (every 7 days or more often)
Smith Park	Smith Dr. & S. 14th St.	0	1	2	3
“Wyandotte & N. 49th St.” Park	Madison Ave. & N. 39th St.	0	1	2	3
Ford Community Park (Unfinished)	N. 42nd St. & Lawson Blvd.	0	1	2	3
Great Plains Park	Plains Dr. & N. 46th St.	0	1	2	3

**Walking Trails**

Please indicate how often you go to these WALKING TRAILS, with your child, in your free/leisure time:

Resource Name	Location	Never	Once a month or less (every 30 days or less often)	Once every other week (every 14 days)	Once a week or more (every 7 days or more often)
Prairie Park Trail	S. 46th St., (the very south end)	0	1	2	3

## Appendix H



**Physical Activity Knowledge Assessment**

Please try to answer each question. If you do not know the answer, you can provide your best guess or leave it blank.

1.) How many minutes of physical activity should children (ages 6 – 17 years old) get each day?

\_\_\_\_\_ Minutes

2.) Vigorous physical activity cause large increases in breathing or heart rate (running is an example of vigorous physical activity).

How many times each week should children get vigorous physical activity?

\_\_\_\_\_ Times each week

3.) Please name 6 examples of aerobic physical activity:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

4.) Please name 6 examples of muscle strengthening or bone strengthening physical activity:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

5.) Physical activity among children (ages 6 – 17 years old) can reduce the risk a few types of chronic conditions. Please name 4 of these conditions:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

## Appendix I

## Physical Activity Knowledge Assessment Responses

Pre-Test

Assessment Item	Correct Response(s)	Incorrect Response(s)
1. How many minutes of physical activity should children (ages 6 – 17 years old) get each day?		<u>Raul's mother:</u> 120
	<u>Maria's mother:</u> 60	
		<u>Julio's mother:</u> 90
	<u>Carlos' mother:</u> 60	
	<u>Jimena's father:</u> 60	
2. Vigorous physical activity causes large increases in breathing or heart rate (running is an example of vigorous physical activity). How many times each week should children get vigorous physical activity?		<u>Raul's mother:</u> At least 2
		<u>Maria's mother:</u> (Did not know)
		<u>Julio's mother:</u> 2
	<u>Carlos' mother:</u> 3	
	<u>Jimena's father:</u> 3	
3. Please name 6 examples of <u>aerobic</u> physical activity.	<u>Raul's mother:</u> Dancing, kickboxing, step aerobics, walk, running	<u>Raul's mother:</u> (One response left blank)
	<u>Maria's mother:</u> Running, swim, dance, soccer, football, biking	
	<u>Julio's mother:</u> Walking, jump jacks, running, swimming	<u>Julio's mother:</u> Pushups, sit-ups
	<u>Carlos' mother:</u> Ride bicycle [bicycle], jump rope, walk, play soccer, dance	<u>Carlos' mother:</u> (One response left blank)
	<u>Jimena's father:</u> Running, dance, soccer, baseball, swimming	<u>Jimena's father:</u> Volleyball
4. Please name 6 examples of <u>muscle strengthening</u> or <u>bone strengthening</u> physical activity:	<u>Raul's mother:</u> Weight lifting	<u>Raul's mother:</u> Walk, (four other responses left blank)
	<u>Maria's mother:</u> Sit-ups	<u>Maria's mother:</u> (Four responses left blank)
	<u>Julio's mother:</u> Weight	<u>Julio's mother:</u> Bicycle, boxing
	<u>Carlos' mother:</u> Volleyball, basketball, lifting things	<u>Carlos' mother:</u> (Three responses left blank)
	<u>Jimena's father:</u> Running, basketball, gymnastics, volleyball, weight lifting, bicycle	
5. Physical activity among children (ages 6 – 17 years old) can reduce the risk of a few types of chronic conditions. Please name 4 of these conditions:	<u>Raul's mother:</u> Diabetes	<u>Raul's mother:</u> Blood circulation, digestion (rationale: not conditions)

## Appendix I (Continued)

		<u>Maria's mother:</u> Asthma (rationale: not associated with inactivity), heart attack (rationale: not a condition), (Two responses left blank)
	<u>Julio's mother:</u> Childhood diabetes, overweight or obesity	<u>Julio's mother:</u> Asthma (rationale: not associated with inactivity), heart problems (rationale: too general)
	<u>Carlos' mother:</u> Diabetes, heart deacease [disease], high blood pressure	<u>Carlos' mother:</u> Cholesterol (rationale: not a condition)
	<u>Jimena's father:</u> Obesity, hypertension	<u>Jimena's father:</u> Shrunk heart (rationale: not a medical condition), reduced height (rationale: not associated with inactivity)

## Post-Test

Assessment Item	Correct Response(s)	Incorrect Response(s)
1. How many minutes of physical activity should children (ages 6 – 17 years old) get each day?	<u>Raul's mother:</u> 60	
	<u>Maria's mother:</u> 60	
	<u>Julio's mother:</u> 60	
	<u>Carlos' mother:</u> 60	
	<u>Jimena's father:</u> 60	
2. Vigorous physical activity causes large increases in breathing or heart rate (running is an example of vigorous physical activity). How many times each week should children get vigorous physical activity?	<u>Raul's mother:</u> 3	
		<u>Maria's mother:</u> 60
	<u>Julio's mother:</u> 3	
	<u>Carlos' mother:</u> 3	
	<u>Jimena's father:</u> 3	
3. Please name 6 examples of <u>aerobic</u> physical activity.	<u>Raul's mother:</u> Football, dance, bosketball [basketball], soccer	<u>Raul's mother:</u> Playground, (one item left blank)
	<u>Maria's mother:</u> Walk, bicicle [bicycle], basketball, soccer, swim	<u>Maria's mother:</u> Jump
	<u>Julio's mother:</u> Running, walking, baseball, basketball, soccer	<u>Julio's mother:</u> (One item left blank)
	<u>Carlos' mother:</u> Dancing, running, bycycling, jump the rope, basketball	<u>Carlos' mother:</u> Volley
	<u>Jimena's father:</u> Caminar [walk], correr [run], brincar [play], bailar [dance]	<u>Jimena's father:</u> Abdominales [abdominals], juegos en parquet [play in park]
4. Please name 6 examples of <u>muscle strengthening</u> or <u>bone strengthening</u> physical activity:	<u>Raul's mother:</u> Pushup, sit-up	<u>Raul's mother:</u> Football, (three items left blank)
	<u>Maria's mother:</u> Bollyball [volleyball], push-up, sit-up	<u>Maria's mother:</u> (Three items left blank)

## Appendix I (Continued)

	<u>Julio's mother:</u> Weights, jump rope	<u>Julio's mother:</u> Swimming, bicycling
	<u>Carlos' mother:</u> Pushups, baseball, lighting weights [lifting weights]	<u>Carlos' mother:</u> Football, (two items left blank)
	<u>Jimena's father:</u> Pesas [weights], push ups, yoga, basketbald [basketball]	<u>Jimena's father:</u> Bicicleta [bicycle], lagartijas [push ups]
5. Physical activity among children (ages 6 – 17 years old) can reduce the risk of a few types of chronic conditions. Please name 4 of these conditions:	<u>Raul's mother:</u> Heart disease [heart disease], diabetis [diabetes], colon cancer	<u>Raul's mother:</u> Stress-depressions (rationale: depression correct but stress was not discussed)
	<u>Maria's mother:</u> Blood pressure, diabetic, cancer (some)	<u>Maria's mother:</u> Heart attack (rationale: not a chronic condition)
	<u>Julio's mother:</u> Heart disease, diabeties [diabetes], obesity	<u>Julio's mother:</u> (One item missing)
	<u>Carlos' mother:</u> Colon cancer, high blood pressure, diabetes	<u>Carlos' mother:</u> Stress or depression (rationale: depression correct but stress was not discussed)
	<u>Jimena's father:</u> Obecidad [obesity], presion alta [high blood pressure]	<u>Jimena's father:</u> Heart attack (rationale: not a chronic condition), colsterol [cholesterol] (rationale: not a chronic condition)



## Appendix J

**Satisfaction Survey**

I will read 17 statements to you. Each statement relates to the physical activity program that you participated in (with Dan from KU). Please circle the number (1, 2, 3, 4, 5, 6 or 7) to indicate your level of agreement with the statement. Here are the choices you can circle:

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

There is no right or wrong answers; just circle the number that you feel best represents your level of agreement with the statement.

After we finish this, your answers will be placed in a sealed envelope, and I (Dan) will NOT know what your answers were, so please answer honestly.

Let's start with a practice statement; remember, there is no right or wrong answers.

0.) The weather was hot this summer.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

## Appendix J (continued)

Now we will begin the satisfaction survey. Please circle the number that you feel best represents your level of agreement with the statement.

1.) I am satisfied with my child's current level of physical activity.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

2.) My child enjoys being physically active.

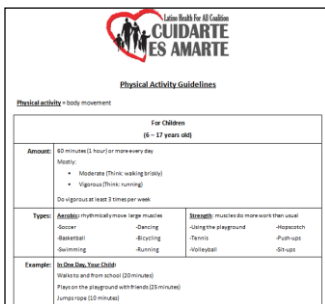
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

3.) This program was helpful for my child to become more physically active

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

## Appendix J (continued)

The next 2 question relates to the physical activity education part of the program, which looked like this:



4.) The physical activity education part of the program was helpful.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

5.) The physical activity education part of the program was easy to understand.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

## Appendix J (continued)

The next 4 questions relates to the goal setting part of the program, which looked like this:

Physical Activity Goals				
Week Starting On (Month/Date): _____				
Day: <i>Monday</i>				
Activity	Adult	Start Time	Minutes (10 or More)	Complete?
<i>-Walk to the library</i>	<i>-Mom</i>	<i>-10:00 AM</i>	<i>-20 minutes</i>	<input checked="" type="checkbox"/>
<i>-Dance</i>	<i>-Sister</i>	<i>1:00 PM</i>	<i>-15 minutes</i>	<input checked="" type="checkbox"/>
<i>-Play at park</i>	<i>-Dad</i>	<i>-3:00 PM</i>	<i>-25 minutes</i>	<input checked="" type="checkbox"/>
Total: <i>60 mins.</i>				
Day: _____				
Activity	Adult	Start Time	Minutes (10 or More)	Complete?
Total: _____				

6.) The goal setting part of the program was helpful.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

7.) The goal setting part of the program was easy to do.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

Appendix J (continued)

8.) Even though the program is over, I will keep setting goals for my child to be physically active.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
1	2	3	4	5	6	7

9.) Even though the program is over, I will keep using the goal setting sheets provided by Dan.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
1	2	3	4	5	6	7

The next 3 questions relates to the behavioral contract part of the program, which looked like this:

<b>Task:</b>	<b>Contract</b>	<b>Reward:</b>
Who: _____	You can earn up to 6 stickers each day and exchange them for a reward on _____.	
What: For every 10 minutes of activity, you get a sticker.	<ul style="list-style-type: none"> <li>• For _____ stickers, you get: _____</li> <li>• For _____ stickers, you get: _____</li> </ul>	
When: <i>Anytime.</i>		
Child Signature: _____	Date: _____	
Parent Signature: _____		
<b>Put your stickers here!</b>		
Day: Monday	Tuesday	Wednesday
Thursday	Friday	Saturday
Sunday		

10.) The behavioral contract was helpful.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
1	2	3	4	5	6	7

Appendix J (continued)

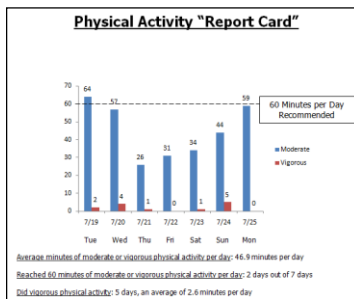
11.) The behavioral contract was easy to complete.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

12.) Providing stickers for every 10 minutes of physical activity was easy to do.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

The next 2 questions relates to the report card part of the program, which looked like this:



13.) The physical activity report card was helpful.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

## Appendix J (continued)

14.) The physical activity report card was easy to understand.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

The final 3 questions ask about your general feelings about this program.

15.) The home visits (with Dan) were helpful.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

16.) I would recommend this program to other parents I know.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

17.) My child is healthier after participating in this program.

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neutral</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

## Appendix J (continued)

Please provide any other suggestions for improving this program. You may write in English or Spanish:



## Appendix K



### Physical Activity Guidelines

**Physical activity** = body movement

<b>For Children (6 – 17 years old)</b>			
<b>Amount:</b>	60 minutes (1 hour) or more every day Mostly: <ul style="list-style-type: none"> <li>▪ Moderate (Think: walking briskly)</li> <li>▪ Vigorous (Think: running)</li> </ul> Do vigorous at least 3 times per week		
<b>Types:</b>	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <b><u>Aerobic:</u></b> rhythmically move large muscles            -Soccer            -Basketball            -Swimming            -Dancing            -Bicycling            -Running         </td> <td style="width: 50%; vertical-align: top;"> <b><u>Strength:</u></b> muscles do more work than usual            -Using the playground            -Tennis            -Volleyball            -Hopscotch            -Push-ups            -Sit-ups         </td> </tr> </table>	<b><u>Aerobic:</u></b> rhythmically move large muscles -Soccer -Basketball -Swimming -Dancing -Bicycling -Running	<b><u>Strength:</u></b> muscles do more work than usual -Using the playground -Tennis -Volleyball -Hopscotch -Push-ups -Sit-ups
<b><u>Aerobic:</u></b> rhythmically move large muscles -Soccer -Basketball -Swimming -Dancing -Bicycling -Running	<b><u>Strength:</u></b> muscles do more work than usual -Using the playground -Tennis -Volleyball -Hopscotch -Push-ups -Sit-ups		
<b>Example:</b>	<b><u>In One Day, Your Child:</u></b> Walks to and from school (20 minutes) Plays on the playground with friends (25 minutes) Jumps rope (10 minutes) Runs (5 minutes) <u>Does sit-ups (2 minutes)</u> TOTAL: 1 hour and 2 minutes		
<b>Benefits:</b>	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <b><u>Reduced Risk of (Adult):</u></b>            -Heart disease            -Diabetes (type 2)            -High blood pressure            -Cancer (colon, breast)         </td> <td style="width: 50%; vertical-align: top;"> <b><u>Mental Health:</u></b>            -Reduced symptoms of anxiety            -Reduced symptoms of depression         </td> </tr> </table>	<b><u>Reduced Risk of (Adult):</u></b> -Heart disease -Diabetes (type 2) -High blood pressure -Cancer (colon, breast)	<b><u>Mental Health:</u></b> -Reduced symptoms of anxiety -Reduced symptoms of depression
<b><u>Reduced Risk of (Adult):</u></b> -Heart disease -Diabetes (type 2) -High blood pressure -Cancer (colon, breast)	<b><u>Mental Health:</u></b> -Reduced symptoms of anxiety -Reduced symptoms of depression		

Adapted from: *2008 Physical Activity Guidelines for Americans*  
 Centers for Disease Control and Prevention  
<http://www.health.gov/paguidelines/pdf/paguide.pdf>

## Appendix K (continued)

**Physical Activities****Aerobic****I am willing****to do this:**

- Biking
- Walking
- Dancing
- Rollerblading
- Skateboarding

**Strength****I am willing****to do this:**

- Soccer
- Basketball
- Football (American)
- Baseball, softball, Wiffle ball
- Hockey (on pavement)
- Kickball
- Using the playground
- Jumping rope
- Cleaning bedroom
- Helping with laundry
- Helping wash the car
- Sweeping, vacuuming

**Other Activities:**

## Appendix K (continued)

<b><u>Help with Physical Activities</u></b>		
<b>Who can help?</b>	<b>How can they help?</b>	<b>When can they help?</b>
Example: <i>Grandma Rosa</i>	<i>She can walk Maria to school and home from school</i>	<i>Tuesday - Friday mornings and most afternoons when school ends</i>
1.) _____		
2.) _____		
3.) _____		
Others:		
4.) _____		
5.) _____		
6.) _____		

Appendix K (continued)

Physical Activity Goals				
Week Starting On (Month/Date): _____				
Day: <i>Monday</i>				
Activity	Adult	Start Time	Minutes (10 or More)	Complete?
<i>-Walk to the library</i>	<i>-Mom</i>	<i>-10:00 AM</i>	<i>-20 minutes</i>	<input checked="" type="checkbox"/>
<i>-Dance</i>	<i>-Sister</i>	<i>1:00 PM</i>	<i>-15 minutes</i>	<input checked="" type="checkbox"/>
<i>-Play at park</i>	<i>-Dad</i>	<i>-3:00 PM</i>	<i>-25 minutes</i>	<input checked="" type="checkbox"/>
			<b>Total: 60 mins.</b>	
Day: _____				
Activity	Adult	Start Time	Minutes (10 or More)	Complete?
			Total: _____	
Day: _____				
Activity	Adult	Start Time	Minutes (10 or More)	Complete?
			Total: _____	
Day: _____				
Activity	Adult	Start Time	Minutes (10 or More)	Complete?
			Total: _____	
Day: _____				
Activity	Adult	Start Time	Minutes (10 or More)	Complete?
			Total: _____	
Day: _____				
Activity	Adult	Start Time	Minutes (10 or More)	Complete?
			Total: _____	
Day: _____				
Activity	Adult	Start Time	Minutes (10 or More)	Complete?
			Total: _____	

Appendix K (continued)

<b>Contract</b>						
<b><u>Task:</u></b>			<b><u>Reward:</u></b>			
<b>Who:</b> _____			You can earn up to 6 stickers each day and exchange them for a reward on _____.			
<b>What:</b> <u>For every 10 minutes of activity, you get a sticker.</u>			<ul style="list-style-type: none"> <li>▪ For _____ stickers, you get: _____</li> <li>▪ For _____ stickers, you get: _____</li> </ul>			
<b>When:</b> <u>Anytime.</u>						
Child Signature: _____						
Parent Signature: _____			Date: _____			
<b>Put your stickers here!</b>						
<b>Day:</b> _____	_____	_____	_____	_____	_____	_____

## Appendix K

**Providing Stickers**

1. For every 10 minutes you see your child being physically active, give him/her a sticker. The 10 minutes can happen all at once, or be spread out.
2. During the physical activity, encourage your child (verbally, with high-fives)
3. Within five minutes (or less) after the activity, provide the sticker and remind your child why he/she is getting it.
  - Let your child choose a sticker
  - Remind him/her why
  - Remind him/her of the **Contract**

*“Great job! You were active for about 20 minutes, so you get a sticker. If you meet your goal for the week, you will get (REWARD CHOSEN).”*

\*If someone else is taking the child to be physically active, this counts too. Just be sure to get an estimate of how many minutes they were physically active. Then:

- Let your child choose a sticker
- Remind him/her why
- Remind him/her of the **Contract**

## Appendix K (continued)

**Rewards for Physical Activities****Activities**

- Watching a movie
- Playing videogames
- Sleepovers with friends
- Staying up past bedtime
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**Treats\*\*\***

- Whole-grain snacks (pretzels, tortillas, healthy cereals)
- Fruits or vegetables prepared in a fun way (raw fruit or veggies with fat-free ranch dressing)
- Frozen yogurt
- Fat-free pudding
- String cheese
- Cereal bars
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

\*\*\*Foods marketed as low-fat or fat-free can still be high in calories. Likewise, foods touted as cholesterol-free can still be high in fat, saturated fat and sugar. Check nutrition labels to find out the whole story.

**Things**

- Inexpensive sports equipment such as jump ropes
- Small amounts of money
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

## Appendix L

Physical Activity Type	Actual Activity Planned (By All Participants, Verbatim from Goal Sheets)
Aerobic activities (96 Activities planned)	bycicle (3 planned occurrences) Dance (19) Horses (walk) k-mart walked after eating practice ride Bike Punning ride bike ride bikes rollerskating Royals walk Run (5) Scooter She went to the pool the afternoon and went to sleep after that skate (4) Stairs swim (2) swim @ home swim in Rec. Center swimming (3) wak walk (33) walk (she play in the park) Walk (stores) Walk @ Legends Walk and stairs walk around the neighbors walk around the neighborhood Walk from dentist walk legends walk the dog walk to the dog walk w/ grandma walking (2)



## Appendix L (continued)

<b>Physical Activity Type</b>	<b>Actual Activity Planned (By All Participants, Verbatim from Goal Sheets)</b>
Sports activities (35 Activities planned)	Baseball baseball game basketball (10) bosketball (3) football (4) futball play futball soccer (11) valleyball (2) volloyball
Unstructured activities (21 Activities planned)	Ggo to grandma's (play) Park play play @ grandma's play at park play ground play w/cousins playground (14)
Household tasks/chores (12 Activities planned)	Chores pick up toys & room clean de car Clean room garage sale (4) moving (5)
Muscle/bone strengthening activities (6 Activities planned)	Jomp rope jump rope (4) jumprope
Structured activities (3 Activities planned)	elliptical (2) Zumba
Active transportation (3 Activities planned)	walk to Wal-mart walk to zona Rosa (2)
Undetermined (3 Activities planned)	game play steps
Multiple categories (2 Activities planned)	playground football Run Push up