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# Environmental Factors that Influence Physical Activity Participation in Children and Youth: A Synthesis of the Literature

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Environmental Factors that Influence Physical Activity Participation in Children and Youth

A Synthesis of the Literature

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A Synthesis Project

Presented to the

Department of Kinesiology, Sport Studies, and Physical Education

The College at Brockport

State University of New York

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In Partial Fulfillment

Of the Requirements for the Degree

Master of Science in Education

(Athletic Administration)

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December 15, 2018

PHYSICAL ACTIVITY PARTICIPATION OF CHILDREN AND YOUTH

THE COLLEGE AT BROCKPORT  
STATE UNIVERSITY OF NEW YORK  
BROCKPORT, NEW YORK

Department of Kinesiology, Sport Studies, and Physical Education

Title of Synthesis Project: Environmental Factors that Influence Physical Activity Participation  
in Children and Youth: A Synthesis of the Research Literature.

Read and Approved by: \_\_\_\_\_ *Susan C. Petersen* \_\_\_\_\_

Date: \_\_\_\_\_ *12/12/2018* \_\_\_\_\_

Accepted by the Department of Kinesiology, Sport Studies, and Physical Education, The College at Brockport, State University of New York, in partial fulfillment of the requirements for the degree Master of Science in Education (Physical Education).

*Cathy Houston-Wilson*

12/12/18

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Chairperson Approval

Date

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## PHYSICAL ACTIVITY PARTICIPATION OF CHILDREN AND YOUTH

### **Abstract**

Physical activity participation in children and youth is widely regarded as important to ensure proper health. There are many environmental factors that contribute to children and youth being able to participate in physical activity on a daily basis. This synthesis reviewed literature regarding environmental factors that influence physical activity participation in children and youth. Data was collected using the EBSCOHOST search engine, found on The College at Brockport's Drake Memorial Library online research website. Key words in SPORTDiscus and Academic Search Complete databases were combined to obtain 10 studies that focused on this synthesis's purpose and research questions. A synthesis data coding table was compiled with the data from each article. The following five research questions were answered: (a) what are physical activity (PA) patterns of participation like in children and youth? How and when do they change over time, (b) what factors influence PA participation in children and youth, (c) what are the facilitators and barriers to PA participation in children and youth, (d) how are the factors that influence participation in PA different for high SES and low SES children and youth and (e) how are the factors that influence participation in PA different for urban and rural children and youth? Results indicated factors that contributed to PA participation in children and youth included SES status, urban/rural location, accessibility/availability, gender, race/ethnicity, and technology. Major factor that contributed to PA participation in children and youth included the safety of parks and facilities, and distance. These are two factors that were found within youth of both high and low SES and urban/rural locations.

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## Chapter 1

### Introduction

Buses line the outside of the building, mini-vans are being directed by a crossing guard telling mom and dad to say “good-bye” to their children and let them out before they go into school to spend the next six hours of their day. Minutes start to turn into hours and soon it is either time for lunch, recess, physical education class. These are the times school age children and youth typically experience physical activity. While some children will participate in afterschool sports, community sports or recreational programs, there are many children and youth for whom school hours may be the only time in the day when they get for physical activity (Hellmich, 2013). Why do some children get numerous opportunities to participate in sport and physical activity and others get so little? Determining what environmental factors influence physical activity participation in children and youth can provide administrators and others in higher education with an understanding of what they can do to combat inactivity and level the playing field so all children get the Center of Disease Control’s (CDC) recommended 60 minutes a day of physical activity (CDC, 2018a).

Over the past decade, the importance of physical activity on health and well-being across the life span has been established through policy makers and scientists (Paxton, Estabrooks, & Dziewaltowski, 2004). Physical inactivity leads to health issues later in life, however, one of the issues that can be seen early in life is childhood obesity. There are many factors that lead to childhood obesity, among them are race/ethnicity, socioeconomic status (SES) and geographical location such as an urban or rural community. Khan, Newsome, Dol, Yang and Duncan (2018), found that environment, access, affordability, and parents’ own health behaviors contribute to the health and physical activity of children and youth. Khan et al. (2018), provides a helpful

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beginning to looking at environmental factors that influence physical activity in children and youth.

The National Physical Activity Plan (2018) aims to get children and youth physically active each year by encouraging regular physical activity. Each year they produce a report card which tracks how well the plan is succeeding in areas such as overall physical activity, sedentary behaviors, active transportation, active play, physical fitness, family and peers, school, community and built environment and organized sport. Overall, physical activity has received a “D-” every year since 2014. This grade indicates that the plan is succeeding with less than half of children and youth or approximately 20-26% (National Activity Plan, 2018). Other areas that are within the “D to D-” range are sedentary behaviors and active transportation. Perhaps AT the most surprising indicator listed with a “D-” grade on the National Activity Plan’s report card is the school indicator. Although schools provide physical education (PE) class, only 22 states have laws mandating the minimum number of minutes that students should participate in physical education (National Activity Plan, 2018). And although schools often provide opportunities for students after school, many of these activities are part of a pay-to-play policy. Pay-to-play relates to the participants being charged to participate in an activity. More than a quarter of U.S. states have pay-to-play policies in place which may widen the gap between low and high SES groups, which may in turn, lead to lower physical activity participation among children and youth that are a part of the lower SES group (National Physical Activity, 2018).

Numerous studies have explored the environmental factors that influence physical activity participation in children and youth and these studies often focus on environmental factors such as SES and geographical location. Studies conducted by Duncan, Strycker, Chaumeton, and Cromley (2016) and Kasehagen, Busacker, Kane, and Rohan’s (2012) both

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explored SES and geographical location on physical activity of children and youth. More recently, there have been studies that have explored other factors, such as transportation, perceived ability, sedentary behavior, family support and many more. Paxton, Estabrooks, and Dziewaltowski (2013) explore perceived competence and its relation to physical activity among youth, while Swanson, Schoenberg, Erwin, and Davis explore perspectives of physical activity among Appalachian youth. Studying environmental factors that influence physical activity participation in children and youth will help professionals in PA develop an understanding of the causes of physical inactivity in children and youth. With this understanding, administrators and professionals in the field of physical activity can develop and implement programs to increase physical activity in children and youth.

### **Purpose**

The purpose of this synthesis project is to explore environmental factors that influence physical activity participation among children and youth of different SES and urban/rural locations.

### **Research Questions**

1. What are physical activity (PA) patterns of participation like in children and youth? How and when do they change over time?
2. What factors influence PA participation in children and youth?
3. What are the facilitators and barriers to PA participation in children and youth?
4. How are the factors that influence participation in PA different for high SES and low SES children and youth?
5. How are the factors that influence participation in PA different for urban and rural children and youth?

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### **Operational Definitions:**

- 1. Active Transportation:** The use of a human-powered mode of transportation, such as walking or bicycling (CDC, 2018b).
- 2. Socioeconomic Status:** Social status as measured by a combination of income, education, and occupation (American Psychological Association, 2018).
- 3. Geography:** Urban or rural setting. Urban is more dense, has a large population (greater than 50,000), built up and close together. Rural is less dense, sparse population, not built up and at a distance (Ratcliffe, Burd, Holder & Fields, 2016).
- 4. Demographic Characteristics:** Includes race/ethnicity, socioeconomic status (SES) composition, location, and age (Monnat, Lounsbery, McKenzie, & Chandler, 2017).

### **Assumptions:**

- 1.** It was assumed all participants answered surveys truthfully.
- 2.** It was assumed that all participants involved in these studies followed the designated and reported protocols.
- 3.** It was assumed that all instruments and software used within these studies were valid and reliable.

### **Limitations:**

- 1.** Included studies took place only in the United States.
- 2.** Some studies were limited to one gender.
- 3.** Some studies were limited to one socioeconomic status.
- 4.** Some studies took place in one region/state of the United States.

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### **Delimitations:**

1. All articles reviewed were written within the last decade (2008-2018).
2. All articles were peer reviewed and published in an academic journal.
3. Only studies that involved physical activity in urban and rural settings or high and low socioeconomic groups were used.

## Chapter 2

### Methods

The purpose of this chapter is to present the methods used to synthesize research that pertains to environmental factors such as SES and location that influence physical activity participation in children and youth. The following methods were utilized when gathering research articles and in data collection, data coding and data analysis/reporting.

#### Data Collection

All studies selected for this synthesis were located by searching the EBSCOHOST search engine where SPORTDiscus and Academic Search Complete were both utilized to help find relevant articles. The first search of SPORTDiscus and Academic Search Complete yielded 32,918 articles using the search terms “*physical activity*” and “*children or adolescents or youth or adolescents or youth or child or teenager.*” The search was then limited to peer reviewed articles and articles published between 2008-2018. These parameters limited the number of articles down to 22,455, at this time the search terms, “*United States*” and “*factors or causes or influences or reasons*” were added which resulted in 671 articles were identified. Of these 671 articles, 120 of them were searched for relevance to the research questions, the search ended after 120 articles due to many articles being repeated and a majority of the articles having no relevance to the topic. Out of the 120 articles, seven articles were downloaded and saved. From these seven articles five had relevance and were used towards the critical mass. Two articles were deemed relevant for this synthesis, but not suitable for the critical mass.

Using the same two databases the search term “*socioeconomic status*” was added to the terms above. Using the same parameters in the search, 132 articles were found. Only one article was downloaded and saved to be used towards the critical mass. This was the only article

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deemed fit to be downloaded and saved due to its relevance to the topic and it was not found in the previous search.

Next, 587 articles were found by removing the search term “*socioeconomic status*” and adding “*participation*.” Of these 587 articles 120 were reviewed for relevance to the research questions. One of the 120 was downloaded and saved to be used towards the critical mass. Only one article was used due to many of the articles involving populations that did not include children and youth.

Lastly, a third search using “*urban*” and “*rural*” and removing “*socioeconomic status*” and “*participation*” was used. Keeping the databases and search parameters the same as the previous search, 79 articles were found. These 79 articles resulted in three articles being downloaded and saved to be used toward the critical mass. These articles were saved due to having information relevant to specific urban and rural settings. Other articles in this search were not used due to having the wrong age groups, setting, and/or country.

In order to be included in the critical mass, an article had to be a data-based research study published in a peer-reviewed journal between 2008-2018. Another parameter to be included in the critical mass was that the article had to investigate one of the following criteria, based on the research questions: (a) physical activity (PA) patterns of participation in children and youth and how and when they change, (b) factors that influence PA participation in children and youth, (c) facilitators and barriers to PA participation in children and youth, (d) factors that influence PA participation in high SES and low SES children and youth and (e) factors that influence PA participation in urban and rural children and youth.

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A total of ten articles met all requirements and formed the critical mass of the research synthesized in this paper. Some articles were excluded from this synthesis because they did not contain research relevant to the topic.

Articles for this synthesis were obtained from the following peer reviewed academic journals: *Journal of Physical Activity and Health*, *BMC Public Health*, *Journal of Behavioral Medicine*, *Preventive Medicine*, *Maternal & Child Health Journal*, *Research Quarterly for Exercise and Sport*, and *Nursing Research*.

### **Data Coding**

Information obtained for this study involved a two-step approach in an effort to extract the data and make it easily accessible. First, all articles that were approved for the critical mass were put into a word document grid where their citation, purpose, rationale, participants, etc. can be found (See Appendix A). The purpose of the article grid was to have all article information in one area for reference. The article grid includes the following categories: (a) APA citation of the study, (b) purpose, (c) methods and procedures, (d) analysis, (e) findings, and (f) discussion and recommendations for future research.

### **Data Analysis**

Of the ten articles used in the critical mass, four were quantitative, four articles were qualitative and two used mixed methods. Qualitative studies collected data using interviews and focus groups while quantitative studies used surveys and questionnaires to collect data. The quantitative and mixed method studies incorporated a variety of methods when analyzing the data. Many of these studies used, ANOVA, ANCOVA, ANDRE, SPSS, and MPlus Software.

One study used two cohorts, the first cohort used 271 children, 117 males and 154 females and the second cohort used, 141 children, 63 males and 64 females. These two cohorts

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were used to study SES and sedentary behavior of youth between the ages of 8.8-9.6 years-old. A second study used 372 girls from an urban-suburban area, this population was made up of 128 African American girls, 120 Latino American girls, and 124 White girls. This population was used to study the differences in physical activity of girls of different race/ethnicity and SES backgrounds. Three studies used information from the U.S Census to study SES, park availability, and/or urban and rural location to study physical activity within the population of children and youth. Of the last five articles examined as part of the critical mass, one used 14,232, third to fifth grade students from a county in the southeastern region of the U.S. This study examined variations by gender, SES, and race/ethnicity in physical activity of children and youth. Another study used 439 K-12 public schools in Nevada to look at demographic characteristics and physical activity practices, a second used 63 children from the Appalachian region to gain their perspectives on physical activity. The last study consisted of 63 participants, ages 9-11 and made up of 66% girls, with all participants coming from a rural background.

### **Chapter 3**

#### **Review of Literature**

The purpose of this chapter is to review the literature that was used as a foundation for this synthesis. There were a total of ten articles that fit the criteria to be considered part of the critical mass. Of the ten articles, six focused on demographic characteristics, three focused on perceived competence, and one focused on trends in physical activity.

#### **Demographic Characteristics**

Harris, et al. (2015), study sought to examine how park access differs among school-age youth in the United States (U.S.), by using demographic characteristics and urbanicity of block groups. This study obtained population data using the 2010 U.S. Census and American Community Survey, in which data from all 50 states of the U.S and District of Columbia was considered. The 2012 data from TomTom Incorporated was obtained and used to define local, state and national parks. Population and park data were used to form and define block group boundaries which were identical to the 2010 U.S. Census.

A total of 216,013 block groups were analyzed from the 2010 U.S Census, with an average of 207 youth per block group (Harris, et al., 2015). A block group is defined to contain between 600 and 3,000 people and are used to present data and control block numbering. Block groups consists of clusters of blocks within the same census tract (U.S. Census Bureau, 2018). Block groups in this study were defined as urban, large rural, small rural, or isolated as defined by USDA's Economic Research Service Rural-Urban Commuting codes (RUCA) (Harris, et al. 2015). The U.S. Census uses RUCA codes to track urbanization, population density, and commuting patterns as well as incorporates a degree of influence from nearby urbanized areas.

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The block groups consisted of 11,018,770 blocks and the number of blocks within a block group averaged to be 51 blocks. Harris et al. (2015) found that 67.5% of block groups were classified as majority white, 10.6% majority black, 12.8% majority Hispanic, and 7.8% did not have a majority race/ethnic group within the block group. Both Asian/Pacific Islander and American Indian/Alaskan Native were represented within the block groups but at a percentage less than one.

Park access was determined by a block group being within a half mile of a park. Harris et al. (2015) determined this distance through a study by Nicholls (2001), and mimicked this approach. Using this definition of park access, 61.3% of the 53,968,234-youth had access to at least one park, however Harris, et al. (2015) found that park access varied by race/ethnicity, median education, and median household income, all of which are demographic characteristics. Among these demographic characteristics, it was found that youth within the block groups with lower median education, and lower median household income had the greatest proportion of park access. The most notable difference in park access found by Harris, et al. (2015) was among urban and rural block groups. Urban block groups were found to have higher park access versus all rural block groups even compared to racial/ethnic, education, and household income categories. This study also represented which areas of the U.S. had a higher proportion of park access. It was found that Northeast, Pacific, and West regions of the U.S. had the highest park access which includes states such as California (85.6%), Connecticut (82.5%) and Hawaii at approximately 80.0% (Harris, et al., 2015).

Overall this study by Harris et al. (2015) revealed that demographic characteristics are related to park access among school-age youth. The demographic characteristics of location, race/ethnicity, median education level, and median education level influenced park access.

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However, Harris et al. (2015) found that park access depends largely on whether youth live in urban or rural areas. These findings persist when adjusting for race/ethnicity, median education level, and median household income. When looking at the region of the U.S and states that have the highest proportion of park access, these were the regions and states that have the highest proportion of urban block groups. Harris et al. (2015) findings support the findings of similar studies done on park access. These findings are important because they show that demographic characteristics and location influence children and youth's access to parks and physical activity.

A second study by Monnat, Lounsbury, McKenzie, and Chandler (2017) sought to examine 16 specific PA practices in elementary, middle, and high schools in Nevada and their association between multiple school demographic characteristics. The authors hypothesized, "schools with greater proportions of demographically vulnerable students (Black, Hispanic, low-SES), schools with higher student-to-teacher ratios, and rural schools would be less likely to have PA supportive practices in place." (p. S5).

Data was collected in this study with the use of a web-based survey distributed by email from the district superintendent offices to all Nevada K-12 public school principals in the fall of 2014. A sample of 412 schools was included, which is 63.2% of all K-12 Nevada public schools. This data was used to perform binary logistic regression to determine odds ratio and 95% confidence interval for the association between school demographic characteristics and school PA practices (Monnat et al. 2017). All analyses were done using SAS software and a total of 14 PA measures were used. Completion of this analysis demonstrated the importance of the school having availability of indoor and outdoor PA spaces, certified PE instructors, classroom breaks, and bike racks. The authors did not find significant demographic disparities and attribute this

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finding in part to the state of Nevada laws. Nevada has laws and regulations in place for PA in schools, such as requiring students to participate in at least 150 min of PE a week.

The third study had a two-part purpose. Duncan, Stycker, Chaumeton & Cromley (2016) sought to determine whether relations between neighborhood variables and moderate to vigorous physical activity (MVPA) and active transport (AT) to/from school differed across African American, Latino American, and White urban early adolescent girls living in the U.S. where the effects of age and family income are controlled (Duncan, et al. 2016). The study also sought to determine the extent to which relations between neighborhood variables were similar to or different across the three ethnic groups (Duncan et al. 2016). There were 372 participants in this study, 128 African American girls, 120 Latino American girls and 124 White girls. All the participants resided in an urban-suburban area of Portland-Gresham, Oregon. Only families who had 10-, 12-, or 14-year-old girls were recruited. These families were randomly recruited from 41 socioeconomically diverse and geographically dispersed neighborhoods using telephone, door-to-door, and word-of-mouth (Duncan et al. 2016). Out of the families recruited, 67.8% consented to participate. The researchers conducted interviews with parents present to assess girls younger than the age of 12, for girls older than 12 assessments were done in private, away from family members, to enhance confidentiality. Assessments and interviews lasted between 30-75 minutes.

Duncan et al. (2016) used a GT3X+ Actigraph accelerometer device to track the participants' activity. The participants were to wear the device for seven consecutive days and 24 hours a day except when in water. The accelerometer was used to calculate mean minutes a day the participants were active. The researchers used cut points derived from a study conducted by Freedson, Pober, and Janz (2005). These cut points are 500-3,999 counts per minute (CPM) for

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moderate activity, 4,000-7,599 CPM for vigorous activity and 7,600+ CPM for very vigorous activity. Cut points were determined using ActiLife5 software and using the formula,  $METs = 2.757 + (0.0015 \times CPM) - (0.0897 \times \text{age}) - (0.000038 \times \text{COM} \times \text{age})$  (Duncan et al. 2016).

Active transportation to/from school was determined by the use of two survey items for both participants and parents. The survey questions were separated based on how often the participant walked, biked, rode a scooter, etc. to school and then how often they did the same returning home from school. Responses between participant and parents were summed and averaged to create an AT to/from school variable. In order to find neighborhood variables, 13 items from the survey were used. An example of one of the items used was for the participants to rate to what extent specific barriers in their neighborhood influence their PA participation. These responses were rated on a scale of 1= never to 4 = very often (Duncan et al. 2016). A total neighborhood barrier score was created by averaging the score of the 13 items, with lower scores indicating fewer perceived barriers and higher scores indicating greater perceived barriers to PA. The last variable used in the analysis was a demographic one, which was age and family income per capita. Duncan et al. (2016) used a 1-6 score based on family income and then divided the number based on the number of family members to adjust for household size which resulted in the score used in the analysis.

Structural equation modeling (SEM) was used to examine relations between neighborhood environment variables, MVPA and AT to/from school, while multiple-group SEM was also utilized to test for differences across the three ethnic groups. MPlus software was used to estimate models using a sample size of approximately 120 participants per ethnic group. The goal of this analysis was to test for significant differences by ethnic groups.

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After the analysis, Duncan et al. (2016) found that across both MVPA and AT to/from school and all three ethnic groups that a greater perceived neighborhood PA facility accessibility is positively and significantly related to PA and AT to/from school. This finding represents that youth PA is influenced by the presence of nearby recreational facilities. AT to/from school was influenced by three factors, distance, neighborhood environment, and the demographic characteristic of income. When looking at these three factors, they are all influenced by SES. Participants of lower SES not only related to more AT, but also living in closer proximity to the school. However, these neighborhoods also have fewer built in social environmental supports which were found to influence PA participation and choices.

In connection to Duncan et al. (2016), the three final studies explored neighborhood park and playground availability, neighborhood characteristics and PA, and SES on habitual PA and sedentary behavior. The first study done by Hughey, Kaczynski, Child, Moore, Porter, and Hibbert (2017) had a two-part purpose. First, examine youth obesity and its association with neighborhood park and playground availability and second, assess whether youth race/ethnicity and SES were responsible. Hughey et al. (2017) used a large county in the southeastern U.S. which had a population of 474,266 in 2013. This population was 77.1% Non-Hispanic White, 18.5% African American, and 8.5% Hispanic or Latino. A median income of \$48,886 was reported with approximately 15.0% of the population living below the federal poverty line. Within this county, physical education teachers from 51 elementary schools collected height and weight data from 14,232 youth. This data was used to determine BMI of the participants. Demographic characteristics were obtained from the U.S. Census Bureau's 2008-2012 American Community Survey to determine block groups, in which 255 were used. Park and playground

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availability were determined by a geographical information system (GIS: ArcGIS 10.2.2), and an audit from all available open playgrounds in 2013.

Using two-level linear models, Hughey et al. (2017) found youth race/ethnicity and SES were significantly related to a higher BMI, which is a result of lower PA in both African American and Hispanic youth. It was also found that higher park availability is associated with lower BMI among males and females, however there is a growing safety concern within areas with minority youth and low SES. This concern comes with unsafe circumstances which may begin to limit park use in these areas.

Kasehagen, Busacker, Kane, and Rohan (2012), examined neighborhood characteristics and their on effects youth physical activity within different types of rural-urban commuting areas (RUCAs). By analyzing data from the 2007 National Survey of Children's Health (NSCH), a survey designed to provide prevalence estimates for a variety of physical and emotional health indicators in children younger than 18. Kasehagen et al. (2012) was able to focus on the parental report of the youth's neighborhood characteristics. By focusing on this variable Kasehagen et al. (2012) found that urban youth were less physically active than rural youth. It was found that the presence or absence of neighborhood parks may not be a great indicator of PA, in part due to neighborhood parks not being viewed as safe locations for PA, which represents a possible barrier to PA.

The third study in this category was conducted by Drenowatz, Eisenmann, Pfeiffer, Welk, Heelan, Gentile and Walsh (2010). The purpose of this study was to examine physical activity and sedentary behavior and whether they differ in children by SES independent of BMI. Two cohorts were used in this study, 271 children, consisting of 117 males, and 154 females in the first cohort and 131 children, 63 males, and 68 females in the second cohort. In cohort one, the

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average age was 9.6 years and 8.8 years in study two. BMI was assessed according to standard procedures and was recorded. Household income data was supplied by the parents of the children and was used to determine SES. In order to determine habitual PA, a pedometer was used in cohort one and an accelerometer in cohort two. A pedometer measures steps/day and an accelerometer measures time spent in MVPA. In cohort two, data from time spent watching television and on the computer was self-reported and used to measure sedentary behavior.

Drenowatz et al. (2010) analysis indicated a significant difference in sedentary behavior between SES groups. This finding was consistent within both cohorts and showed that higher SES groups spent less time being sedentary. Drenowatz et al. (2010) pose several possible reasons for differences in habitual physical activity. One reason stated by the authors is socio-environmental influences which include accessibility to facilities and safety. A second finding was that, lower PA participation among lower SES groups was found in both cohorts. Lastly, sedentary behavior such as screen time and television use was higher among lower SES groups in both cohorts.

### **Perceived Barriers**

The first two studies in this category addressed youth perspectives on PA, primarily within rural environments. First, Swanson, Schoenberg, Erwin, and Davis (2012) explored perspectives of Appalachian youth on PA. Through understanding these perceptions, the authors had the goal of developing programming to increase PA that is culturally appropriate. The central portion of Appalachia was used in this study. This region includes 410 counties over 13 states, with 22 million people which is approximately 8% of the U.S. population. Data from five counties in this region was collected. These five counties were studied due to their low SES and health indicators, which are among the lowest in the U.S.

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Eleven focus groups were used with participants between the ages of 8- to 17-years. Focus group questions were designed to gain insight in areas such as what the participants like and dislike about PA and exercise, what keeps them from participating in PA and exercise, and what should be kept in mind when programs are planned. Upon analysis of the focus group data, the authors found that the perception of the difference between PA and exercise was that PA was associated with leisure activity or something done for fun where exercise was serious and structured. The authors also found many barriers to participating in PA, which included not having resources dedicated to PA such as, lack of time, technology, and money, all of which are typically described by adults and those who are from an urban environment (Swanson, et al. 2012). Swanson et al. (2012), noted that the rural youth group is vulnerable to the same pressures as their urban counterparts. Besides the structure of their environment, they are vulnerable to the same pressures that come from their peers and the growth of technology.

A second study that explores youth perspectives on PA was done by Paxton, Estabrooks, and Dziewaltowski (2013). The purpose was to investigate the relationships between perceived physical competence, attraction to PA, and PA behavior. The authors hypothesized that the attractions youth have to PA would be mediated by their physical competence.

The Head, Heart, Health, and Hands (4-H) youth development club was used to recruit participants. 4-H clubs from a midwestern state were selected due to their offering of well-established programs in a rural environment. A total of four clubs across two counties were used in this study which had a total membership of 97. Of these 97 members, 63 participants provided parental consent for a response rate of 66.5%. All participants were Caucasian and made up of 66% female and 34% males. The participants were asked to complete The Physical Activity Questionnaire for Older Children (PAQOC). This questionnaire uses nine questions to assess

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participation in common sports, leisure activities, PE class, recess, evenings after school and on the weekend (Paxton et al. 2013). The second purpose of this study was to determine perceived physical competence. This was assessed through the Physical Competence Scale for Children which is scored on a four-point scale. The third and final purpose was to assess attraction to physical activity. The Children's Attraction to Physical Activity Scale (CAPAS) was used which consists of 15 items derived from five subscales which are: peer acceptance, physical exertion, games and sports, liking of exercise, and importance of exercise (Paxton et al. 2013).

Upon analysis of the three measures, the authors found that perceived physical competence, attraction to PA, and PA behaviors are related. This finding is important because it extends previous research demonstrated within the rural youth population. A second finding extends previous research by demonstrating statistical mediation of perceived physical competence, and physical activity relationship by youths' perceptions of attraction to physical activities (Paxton et al. 2013). Lastly, this study provides insight to practical interventions and development for rural youth. Although the authors found that rural youth participants were not very active, 4-H programs provided a practical intervention for programming for rural youth. This finding is important because it provides an avenue to increase PA among rural youth.

A third and final study in this category was done by Vermeesch, Ling, Voskuil, Bakhoya, Wesolek, Bourne, Pfeiffer, and Robbins (2015). This study explored perceived barriers to PA. This study had a three-part purpose. First, they sought to determine differences in ratings of interference of barriers to PA for pubertal stage, race/ethnicity, and SES. A second purpose was to examine perceived barriers of PA and relationships between age, recreational screen time, sedentary activity, and BMI. Lastly, the authors tried to determine the top-rated perceived barriers to girls' PA (Vermeesch et al. 2015).

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A total of 509 girls from eight midwestern U.S. schools participated. Participants and their parents completed a demographic survey which provided data on age, academic grade, race/ethnicity, and SES. In order to gain insight on recreational screen time and sedentary behavior participants reported the number of hours they spent engaging in activities such as watching television, talking on the phone and computer use. To assess minutes per hour of sedentary activity and PA, participants were asked to wear an accelerometer (ActiGraph GT3-plus). The accelerometer was to be worn for seven consecutive days except when showering, swimming, and sleeping at night. Lastly, perceived barriers to PA data was gathered with the use of a nine-item Perceived Barrier Scale. This tool was designed to measure perceptions of obstacles interfering with PA. Data was then analyzed using the Statistical Package for Social Sciences (SPSS). Independent sample *t*-tests and one-way ANOVA were used to examine biological and sociocultural differences in screen time, sedentary activity, BMI, PA, and perceived barriers (Vermeesch, et al. 2015).

Analysis of the data found that on average participants spent approximately 38 minutes of each hour outside of school sedentary or approximately six hours of each day. The authors found that participants from low-SES groups reported significantly greater perceived barriers to PA. Perceived barriers included lack of skill, difficulty finding programs, being tired, hating to sweat, and having pain prior to and during puberty. This study found that among girls, pubertal stage, racial/ethnic, and SES differences in girls' were the top perceived barriers to PA. Understanding this finding is important because it provides insight to the biological and sociocultural differences in perceived barriers to PA. Understanding these perceived barriers allows for the design more effective interventions by using systematic and meaningful personalized strategies

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to assist diverse groups of urban girls in overcoming their perceived barriers to PA (Vermeesch et al. 2015).

### **Trends in Physical Activity**

One study focused on trends in physical activity and sedentary behaviors of United States youth. Bassett, John, Conger, Fitzhugh, and Coe's (2015) research sought to study time trends in physical activity and sedentary behavior in U.S. children and adolescents. Information was located using PubMed and derived by using peer-reviewed journal articles and data from the Youth Risk Behavior Surveillance System (YRBSS) survey. Information on sports participation was gathered from the National Federation of State High School Associations and U.S. Department of Education, while participation for other outdoor activities was gathered from the U.S. Fish and Wildlife Service and U.S. National Park Service.

Upon reviewing and analyzing the information the authors found a decline in youth PA within multiple areas. These areas included active transportation, physical education and outdoor play. All of these areas were once common areas for children and youth to expend large amounts of energy. The authors also found that due to declines in these areas that there is now an increased reliance on structured activities. Structured activities include before and after school activities, community recreation and organized sports programs. These findings are important because they provide areas of PA that need to be increased among U.S. youth to limit sedentary behaviors. The authors suggest that the use of the sociological model will provide a useful framework when developing ways to promote PA. The use of this model starts with individual factors which include knowledge, skills, and attitudes about PA, which are all important factors that influence behavior. Using this model and moving outward, relationships with parents, teachers and peers all influence PA in children and youth. Lastly, organizations such as schools

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and communities provide an important setting for children and youth to learn and participate in PA. Both of these settings play an important role in increasing PA levels and decreasing sedentary behavior among children and youth.

## Chapter 4

### Results

The purpose of this chapter is to report the results of this synthesis based on the original research questions. A total of ten studies were found suitable for the critical mass and were used to create the results for this synthesis. The following research questions were proposed for this synthesis:

#### **Research Questions:**

1. What are physical activity (PA) patterns of participation like in children and youth? How and when do they change over time?
2. What factors influence PA participation in children and youth?
3. What are the facilitators and barriers to PA participation in children and youth?
4. How are the factors that influence participation in PA different for high SES and low SES children and youth?
5. How are the factors that influence participation in PA different for urban and rural children and youth?

#### **What are physical activity (PA) patterns of participation like in children and youth? How and when do they change over time?**

There were a total of five studies included in this synthesis that focused on reporting physical activity participation patterns in children and youth and how they have changed over time. Results from these studies revealed many common patterns in physical activity among children and youth and what causes them to change. Some of the patterns explored in these studies include more children and youth moving toward organized sport rather than recreational

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play, children and youth participating in more sedentary activities rather than participating in PA, and children and youth moving away from AT to/from school.

A study done by Bassett et al. (2015), revealed that there has been a decline in PA among children and youth. One trend they revealed is an increased reliance on structured activities, such as after school activities, and individual and team sports. The studies that supported an increased reliance on structured activities were Swanson et al. (2012) and Monnat et al. (2017). Within each study, perspectives of PA among children and youth and demographic characteristics among children and youth were explored. Both of these studies found that the school setting provides an essential setting to increase PA in children and youth.

A second trend found within the studies that are included in this synthesis was an increase in time spent in sedentary behaviors. Sedentary behaviors have become more of a trend with the increase that has been seen in technology. Bassett et al. (2015) found an increase in time spent using electronic media such as, video games, cell phones, and television. Bassett et al. (2015) also found that on average 8-18 year old's spend approximately 53 hours a week using electronic media. Swanson et al. (2012) discovered that technology contributed to a decline in PA among children and youth. Swanson et al. (2012) found that the growth of technology has contributed to youth feeling that there are more important things to do than participate in PA. A quote from a girl in their 15-17-year-old group stated, "I've got better things to do, like Internet and stuff. Well that's not better things to do, but it's a thing you want to do more" while a boy in the 8-10-year-old group stated that his first priority when he comes home from school is, "video games, TV, computer, all that stuff. That's what I usually do, sitting around the house." (Swanson et al. 2012, p. 45). Technology is one trend that has changed over time, for example, while time spent watching television decreased from 1999-2009, the domains of cellphones,

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music players, and the internet were added and increased total screen time among children and youth (Bassett et al., 2015).

The third major trend that was found is AT to/from school. While transportation methods such as the use of the automobile, have increased as a way to transport children and youth to/from school, methods such as walking and biking have decreased drastically (Bassett et al., 2015). This trend can be seen in part due to more families owning an automobile and due to communities growing outward. Distance to school plays a significant role in walkability for children and youth to/from school (Duncan et al., 2016). However, Duncan et al. (2016) found that neighborhood environment and safety were also found to contribute to the decline in AT to/from school, a finding that is supported by Hughey et al. (2017).

### **What factors influence PA participation in children and youth?**

A total of five studies focused primarily on the factors that influence PA participation in children and youth. Results from the first study showed that park access and recreational facility availability was a factor that influenced PA participation among children and youth (Hughey et al., 2017). Duncan et al. (2016) found the presence of parks and recreational facilities is important for youth PA. This factor is important because the perceived environment such as accessibility, comfort and convenience contributes to PA in children and youth. Harris et al. (2015) found that park access can encourage higher levels of PA in children and youth.

Accessibility and availability are factors that many of these studies explored. Many of these studies explored the importance of schools providing programs for students to participate in to help increase PA in children and youth. Monnat et al. (2017) found that availability of indoor and outdoor PA spaces was among the top ways to increase PA in children and youth. Access and availability are related to park access and recreational facility access, the factor that

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was mentioned above. Hughey et al. (2017) mention that parks are a key component of communities that promote health, especially among children and youth. The factors of access and availability, especially with parks and recreational facilities, is important for children and youth because they aid in combatting childhood obesity by aiding children and youth in obtaining the recommended PA minutes per day (Hughey et al. 2017). With access and availability comes the safety of these facilities. Drenowatz et al. (2010) found that a factor contributing to PA participation in children and youth was safety of these facilities. There may be many parks around a neighborhood but the way they are perceived in terms of safe places contributes to families wanting their children and youth to use them. The idea of safety as a part of access and availability was supported by Kasehagen et al. (2012), Duncan et al. (2016) and Hughey et al. (2017). For example, Kasehagen et al. (2012) found that lack in perceived safety of parks limited their use.

Socioeconomic status was a factor that was found within all five of the studies that explored factors that influence PA participation in children and youth. Vermeesch et al. (2016) found SES was a major issue when it came to children and youth being able to access PA facilities and programs. SES is a factor that contributes to park access, recreational facility access, and availability of PA programs. A family's SES will influence where they live and if they have expendable income to pay for programs outside of the school setting (Duncan et al., 2016). The final three studies done by Kasehagen et al. (2012), Monnat et al. (2017) and Hughey et al. (2017) all express SES as a common factor in PA participation in children and youth. In fact, all three of these studies found SES was a contributing factor to either the presence of amenities or PA programs within neighborhoods.

### **What are the facilitators and barriers to PA participation in children and youth?**

When looking at the research conducted in relation to facilitators and barriers to PA participation in children and youth there were several commonalities. The main facilitators that were found for PA participation in children and youth included physical and mental health benefits, amusement, and sociability. Participants of the 11-14-year-old group in Swanson et al. (2012) study described PA as a way to feel better, sleep better, and weight loss. Participants from Swanson et al. (2012) study also expressed that when PA is fun it is more enjoyable and they want to participate rather than when PA is hard or feels like you have to do it, it makes them not want to take part in it.

Two studies supported Swanson's et al. (2012) findings related to facilitators to PA participation in children and youth. The first study was done by Vermeesch et al. (2015) which found that children and youth, especially girls were more likely to participate in PA if the activity is enjoyable. The second study was conducted by Hughey et al. (2017) and found that the health benefits associated with PA was a facilitator of PA participation for children and youth.

Children and youth experience many barriers in relation to PA participation. These barriers include SES, gender, race/ethnicity, lack of resources, lack of knowledge/skill, psychological barriers, environment, geography, as well as perceived barriers (Swanson et al., 2012, Hughey et al., 2017, & Vermeesch et al., 2015). Swanson et al. (2012) explored the barriers of lack of knowledge, psychological barriers, SES, and geography. This study found that many children and youth feared a lack of knowledge/skill to participate confidently and the psychological barriers of poor motivation and anticipation of injury. Participants in the Swanson et al. (2012) study expressed that they felt there was no one to properly teach them proper PA techniques and they had a fear of the pain associated with PA. Swanson et al. (2012) attributed

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the barriers of lack of knowledge and psychological barriers to geography. This study explored rural children and youth who had limited access to proper PA structures in their environment. Participants expressed that “everything’s too far away” (Swanson et al., 2012, p.45). Many of the participants in this study expressed that living farther away from facilities or having lack of knowledge/skill that they need to have equipment at home or programming done for them. While some participants expressed that they felt their family could afford to put equipment in their home they were aware that many of their classmate’s families could not. The same was found when addressing paying for coaching and PA programs. Many of the children and youth in this study expressed that they wanted programming and proper teaching of PA techniques but were aware that their family could not afford it. One participant expressed that, “yeah, we could not pay no fees because we’re broke” (Swanson et al., 2012, p. 45).

Vermeesch et al. (2015) findings support the findings of Swanson et al. (2012).

Vermeesch et al. (2015) found lack of knowledge/skill, motivation, environment, race/ethnicity, gender and SES to be barriers that affected PA participation in children and youth. SES was found to be one of the primary barriers to PA participation in children and youth. SES was found to contribute to children and youth having access to PA programs or classes to aid in gaining the knowledge and skills of PA. Lack of motivation was another barrier found by Vermeesch et al. (2015) which is a similar finding of Swanson et al. (2012). Lack of motivation was consistently identified by participants within the Vermeesch et al. (2015) study, where lack of motivation primarily came from being tired. Lastly, the barrier of environment on PA participation in children and youth was also found in this study. Environment was primarily associated with access to facilities and a sense of safety in the children and youth’s ability to walk to these

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facilities to participate in PA. The barrier of environment is consistent with the findings of Swanson et al. (2012).

A third study conducted by Hughey et al. (2017) supports the findings of Swanson et al. (2012) and Vermeesch et al. (2015). Hughey et al. (2017) who explored the barriers of gender, SES and race/ethnicity and how they relate to PA participation in children and youth. These barriers were found to contribute to access to PA facilities for children and youth. While Hughey et al. (2017) explored gender, SES, and race/ethnicity, they found that all three of these barriers contribute to the barrier of access. Similar to both Swanson et al. (2012) and Vermeesch et al. (2015) the barrier of access is associated with the environment the children and youth are in.

### **How are the factors that influence participation in PA different for high SES and low SES children and youth?**

There are a variety of factors that influence PA participation for children and youth of both high and low SES. However, the factors that influence PA participation in children and youth of high SES are different than those of children and youth of low SES. A study performed by Drenowatz et al. (2010) found that the factor of accessibility was more prevalent in children and youth of low SES compared to children and youth of high SES. Children and youth of low SES lacked the ability to access facilities needed to participate in PA as well as facilities that are safe to use. This finding is consistent with studies performed by Kasehagen et al. (2012), Duncan et al. (2016), Harris et al. (2015) and Hughey et al. (2017). All of these studies explored access of parks and recreational facilities and they all found that children and youth of lower SES had either less parks and facilities around their environment or a lack of safe parks and facilities. A barrier that is connected to access and availability that is prevalent in children and youth of low SES is access to PA programs, such as before and after school programs and club sports. This

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connection was found by Swanson et al. (2012) in which participants expressed their lack of expendable funds to participate in PA programs.

Sedentary behavior was a barrier found in low SES children and youth which differs from children and youth of high SES. Drenowatz et al. (2010) found that among ages 8.8-9.6-year-olds, sedentary behavior was significantly higher in children and youth of low SES compared to children and youth of high SES. A reason for increased sedentary behavior among children and youth of low SES was proposed by both Drenowatz et al. (2010) and Hughey et al. (2017). Authors of both studies proposed that increased sedentary behavior in children and youth of low SES is largely due to accessibility to facilities and safety to play outside in low income neighborhoods. These findings support Kasehagen et al. (2012), Duncan et al. (2016), Harris et al. (2015) and Hughey et al. (2017) studies.

Low SES and high SES children and youth experience similar factors that influence PA participation. The way high SES children and youth experience them are different. For example, high SES children and youth experience the issue of access to PA facilities. However, high SES children and youth experience not being within walking or biking distance to facilities and rely on parents to transport them (Harris et al. 2015). While children and youth of high SES experience accessibility issues they do not experience the issue of safety that low SES children and youth do (Denowatz et al. 2010).

### **How are the factors that influence participation in PA different for urban and rural children and youth?**

Park and facility access were a main factor that influenced PA participation in children and youth and that was different between urban and rural children and youth. Urban children and youth were found to have an increase in park and facility access compared to children and youth

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living in rural areas (Harris et al. 2015). The study performed by Harris et al. (2015) found that 64% of children and youth living in urban areas had access to parks or facilities for PA, while less than 37% of children and youth living in rural areas had access to parks and facilities needed for PA. States such as California (85.6%), Connecticut (82.5%), and Maryland (approximately 80.0%) were among the highest percentage of parks and facilities to children and youth, while states such as Maine (18.1%), Vermont (approximately 20.0%) and North Dakota (21.8%) ranked among the lowest (Harris et al. 2015). The states with the highest percentage of parks and facilities were the states that had the highest proportion of urban block groups, while the states with the lower percentage had a higher proportion of rural block groups.

Supporting the study performed by Harris et al. (2015) is a study conducted by Hughey et al. (2017). Hughey et al. (2017) found that park access is higher among children and youth of urban areas compared to rural areas. Supporting this finding is a study conducted by Swanson et al. (2012) that found park and facility access to be one of the primary reasons rural youth does not participate in PA. Despite this finding, Kasehagen et al. (2012) found that rural children and youth were more physically active than their urban counterparts. While Kasehagen et al. (2012) found that parks and facilities influenced PA participation, it was found that urban youth neighborhood parks may not be viewed as safe locations for physical activity for children and youth. Paxton et al. (2013) provides support to Kasehagen's et al. (2012) finding of rural youth being more physically active than their urban counterparts. Paxton et al. (2013) found that interventions and programs such as 4-H clubs provide an avenue to learn and participate in PA.

Sedentary behavior was found in both urban and rural children and youth as a factor that influences their PA participation. Swanson et al. (2012) found that rural youth are sedentary because they feel they have nothing to do, which supports having limited access to facilities.

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Their urban counterparts were found to be sedentary because they felt the facilities they had were not safe (Drenowatz et al. 2010, Kasehagen et al. 2012, Duncan et al. 2016, Harris et al. 2015 & Hughey et al. 2017). While the factors influencing PA in children and youth of urban and rural environments may be the same, the way they are experienced are different.

## Chapter 5

### Conclusion/Future Research

#### Conclusion

A total of ten articles were examined to investigate the environmental factors that influence PA participation among children and youth of different SES and urban/rural locations. The research revealed many factors that influence PA participation among children and youth. These factors included SES status, urban/rural location, accessibility/availability, gender, race/ethnicity, and technology. The most significant factor found within the research was SES and access/availability to PA facilities. This factor was found in the majority of the research and also emphasized neighborhood and facility safety in relation to access/availability. Results provided valuable insights regarding how to improve PA participation among children and youth of different SES and urban/rural locations. The research showed that implementing programs such as before and after school programs are valuable services that can aid in increasing PA participation among children and youth.

Vermeesch et al. (2015), Swanson et al. (2012), and Hughey et al. (2017) explored barriers of SES, race/ethnicity, and gender and their relation to PA participation in children and youth. These three studies concluded the barriers of SES, race/ethnicity, and gender contribute to access to facilities needed for PA. Drenowatz et al. (2010), Kasehagen et al. (2012), Duncan et al. (2016), and Harris et al. (2015) added the barrier of location to Vermeesch et al (2015), Swanson et al. (2012), and Hughey et al. (2017) findings. Drenowatz et al. (2010), Kasehagen et al. (2012), Duncan et al. (2016) found that location such as urban/rural contributed to children and youths' access to PA facilities. These findings provide valuable insight into developing

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interventions that are needed to provide access PA facilities to increase PA participation in children and youth.

Sedentary behavior was a trend found within the research. Studies conducted by Bassett et al. (2015) and Swanson et al. (2012) found the increase in technology and the ability to access this technology easily has contributed to decreased PA among children and youth. However, both Bassett et al (2015) and Swanson et al. (2012) expressed that the increase in sedentary behavior is also attributed to the limited accessibility to safe parks and PA facilities. Perceived safety of parks and facilities used for PA was found by Drenowatz et al. (2010), Kasehagen et al. (2012), Duncan et al. (2016) and Hughey et al. (2017).

Access/availability, safety and location were the three key points found within the research. The research explored how environmental factors influenced PA participation in children and youth in relation to these three key points. Understanding how environmental factors influence PA participation in children and youth and these three key points can provide valuable insight to the development of PA programs and the promotion of PA in children and youth.

### **Future Research**

In order to continue learning about the factors that influence PA participation in children and youth there must be a continuation of research. One suggestion for future research is to explore PA participation in various subgroups further. These subgroups include gender, race/ethnicity, and urban/rural locations. With future research within subgroups it is also important to explore possible interventions, such as community-based programming and ways to incorporate local perspectives into the promotion of PA.

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A second suggestion for future research is directed at exploring park features and quality concerns that are important for consistent park use. The final suggestion for future research is an extension of exploring park features. Future research is needed to explore the effects of neighborhood characteristics and to explore the effects of both perceived and objective neighborhood environment (Duncan et al. 2016, & Kasehagen et al. 2012).

Future research is crucial to help explore the factors that influence PA participation among children and youth of different SES and urban/rural locations. Future research can help to provide insight on what causes these factors as well as the interventions that are needed to increase PA participation among children and youth.

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Author/Title/ Citation	Purpose	Methods & Procedures	Analysis	Findings	Discussion/ Recommendations Research Notes –  Commonalities/Differences
<p>Bassett, D., John, D., Conger, S., Fitzhugh, E., &amp; Coe, D. (2015). Trends in physical activity and sedentary behaviors of United States youth. <i>Journal of Physical Activity and Health, 12</i>, 1102-1111.</p> <p>1</p>	<p>Purpose of this study was to study time trends in physical activities and sedentary behavior in U.S. children and adolescents.</p>	<ul style="list-style-type: none"> <li>• Literary search in PubMed</li> <li>• Peer reviewed journal articles.</li> <li>• Used data from the Youth Risk Behavior Surveillance System (YRBSS).</li> <li>• Data from sports participation obtained from NFSHSA.</li> <li>• Participation rates for other outdoor activities obtained from U.S. Fish &amp; Wildlife service and U.S. National Park Service.</li> </ul>	<ul style="list-style-type: none"> <li>• Analyzed data from literary articles, YRBSS, NFSHSA, and U.S. Fish &amp; Wildlife Service and U.S. National Park Service and longitudinal studies to find trends in physical activity and sedentary behaviors among children and youth.</li> </ul>	<ul style="list-style-type: none"> <li>• Found decline in youth PA within AT, PE, and outdoor play.</li> <li>• Increased reliance on structured activities, such as after school activities, individual and team sports.</li> <li>• Found an increase in time spent using electronic media such as video games, cell phones and television. On average 8-18-year-olds spend approximately</li> </ul>	<ul style="list-style-type: none"> <li>• Five Keys: School settings, preschool and childcare settings, community settings, family settings and primary care settings, all of which have promise to increase PA among children and adolescents.</li> <li>• Authors recommend continuation of tracking the indicators that lead to decreased PA to see how the nation is moving towards its goal to combat childhood obesity.</li> <li>• Sufficient evidence has found that the school settings provide an opportunity to increase PA in children and youth.</li> </ul>

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				<p>53 hours a week using electronic media.</p> <ul style="list-style-type: none"> <li>• There has been an increase in the use of automobiles in the transportation of students to/from school, while a decrease on walking/biking to/from school.</li> </ul>	<p>This is through the use of PE class, active transport, and the used of activity breaks.</p> <ul style="list-style-type: none"> <li>• Through good planning and development the community can provide a safer and more conducive setting for children's PA.</li> </ul>
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PHYSICAL ACTIVITY PARTICIPATION OF CHILDREN AND YOUTH

<p>Drenowatz, C., Eisenmann, J., Pfeiffer, K., Welk, G., Heelan, K., Gentile, D., &amp; Walsh, D. (2010). Influence of socio-economic status on habitual physical activity and sedentary behavior in 8- to 11-year old children. <i>BMC Public Health</i>, 10, 1-11.</p> <p>4</p>	<p>The purpose of this study was to examine if physical activity and sedentary behavior differ in children by their SES independent of BMI.</p>	<ul style="list-style-type: none"> <li>• Two cohorts consisting of 271 children (117 males, 154 females) in study one. Study two, 141 children (63 males, 64 females).</li> <li>• Average Age: 8.8-9.6 y/o</li> <li>• Standardized procedures were used to determine BMI.</li> <li>• Pedometer was used in study one and accelerometer in study two.</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• ANOVA used to determine differences in PA and sedentary behavior by SES.</li> <li>• Further analysis using ANCOVA controlling for BMI and leg length in pedometer cohort.</li> </ul>	<ul style="list-style-type: none"> <li>• Children from low SES show a trend of lower PA levels and spend more time sedentary.</li> <li>• Higher BMI in low SES children may be another factor to increased health risks in these children.</li> </ul>	<p>The authors recommend that future studies consider biological aspects, such as pre-natal environment, maternal behavior, an post-natal influences on PA and inactivity.</p>
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PHYSICAL ACTIVITY PARTICIPATION OF CHILDREN AND YOUTH

<p>Duncan, S., Strycker, L., Chaumeton, N., &amp; Cromley, E. (2016). Relations of neighborhood environment influences, physical activity, and active transportation to/from school across African American, Latino Americans, and White girls in the United States. <i>International Journal of Behavioral Medicine</i>, 23, 153-161.</p> <p>2</p>	<p>This study holds two purposes, one, to determine whether relations between neighborhood variables and MVPA and AT to/from school differ across subgroups. Two, to determine to what extent these variables are similar or different across the three ethnic groups of girls.</p>	<ul style="list-style-type: none"> <li>• Controlled age and family income.</li> <li>• 372 girls from urban-suburban area of Portland-Gresham, Oregon (128 African American, 120 Latino Americans, and 124 White).</li> <li>• Families having 10-,12-, or 14- y/o girl were randomly recruited from 41 socioeconomically diverse and dispersed neighborhoods.</li> <li>• Recruited families using telephone, door-to-door, and word-of-mouth methods.</li> <li>• 67.8% of families agreed to participate.</li> <li>• Surveys used to address AT to/from school.</li> <li>• Interviews used to determine neighborhood variables.</li> </ul>	<p>MPlus Software used to determine significant difference between ethnic groups.</p>	<ul style="list-style-type: none"> <li>• All three ethnic groups over both PA measures had a greater perceived neighborhood PA facility accessibility was positively and significantly related to both MVPA and AT to/from school.</li> <li>• Found significant relations between neighborhood environment measures and AT to/from school vs. MVPA.</li> </ul>	<ul style="list-style-type: none"> <li>• The authors suggest that future research should explore the effects of both perceived and objective neighborhood environment on youth PA.</li> <li>• Neighborhood measures along with contextual factors are also suggested to determine the relative influence of these factors on PA across different youth subgroups.</li> </ul>
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PHYSICAL ACTIVITY PARTICIPATION OF CHILDREN AND YOUTH

<p>Harris, C., Paul, P., Young, R., Zhang, X., &amp; Fulton, J. (2015). Park access among school-age youth in the United States. <i>Journal of Physical Activity and Health, 12</i>, 94-101.</p> <p>5</p>	<p>The purpose of this study is to examine the differences in park access among school-age youth, by demographic characteristics and urbanicity of block groups.</p>	<ul style="list-style-type: none"> <li>• Park boundaries defined by 2012 land-use layer from TomTom Inc.</li> <li>• Park polygons were selected with the use of a feature type (FEATTYP) 7170 to include national and state forests and parks, as well as local parks and recreational parks.</li> <li>• Demographic variables: Age, race/ethnicity, median education level, and median household income.</li> <li>• Household income define as, \$35,000, \$50,000, and \$75,000.</li> </ul>	<ul style="list-style-type: none"> <li>• 216,013 block groups were analyzed from the 2010 U.S Census data.</li> <li>• Use of RUCA codes used to classify and analyze urbanization, population density, and commuting patterns.</li> </ul>	<ul style="list-style-type: none"> <li>• Park access was higher among youth within block groups with a higher median income.</li> <li>• Urban had the highest percentage of park access among school-age children (64.3%).</li> </ul>	<ul style="list-style-type: none"> <li>• Although park access is higher among urban youth, it also varies by race/ethnicity, median education, and median household.</li> <li>• The authors recommend considering both demographics and urbanicity may help lead to better characterization of park access and its association with PA among youth.</li> </ul>
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PHYSICAL ACTIVITY PARTICIPATION OF CHILDREN AND YOUTH

<p>Hughey, S., Kaczynski, A., Child, S., Moore, J., Porter, D., &amp; Hibbert, J. (2016). Green and lean: is neighborhood park and playground availability associated with youth obesity? Variations by gender, socioeconomic status, and race/ethnicity. <i>Preventive Medicine, 95</i>, 101-108.</p> <p>2, 3, 4</p>	<p>This study had two objectives, to examine the associations between neighborhood park and playground availability and youth obesity and to assess whether these associations were moderated by youth race/ethnicity and SES.</p>	<ul style="list-style-type: none"> <li>• Setting: Large county in SE U.S. with total population of 474,266.</li> <li>• Trained PE teachers from 51 elementary schools collected height and weight for all children in 3<sup>rd</sup>-5<sup>th</sup> grade (14,232 students).</li> <li>• Height, weight, DOB and date of testing was used to determine BMI and then placed into percentiles using standardized protocols for youth from the CDC.</li> <li>• Block groups were used to determine demographic and socioeconomic characteristics.</li> </ul>	<p>Statistical analysis well as examining the model fit throughout the model-building process by examining the changes in -2 log-likelihood and applying chi-square likelihood ratio test to examining the statistical significance.</p>	<p>Variation was detected in association between park and playground availability and youth and obesity by SES and race/ethnicity.</p>	<ul style="list-style-type: none"> <li>• This study identified variations by gender, race/ethnicity, and SES in association between neighborhood park and playground availability and youth obesity.</li> <li>• The authors recommend that future research aim to identify and better understand environmental influences on obesity in order to create more equitable and healthy communities.</li> </ul>
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PHYSICAL ACTIVITY PARTICIPATION OF CHILDREN AND YOUTH

<p>5</p> <p>Kasehagen, L., Busacker, A., Kane, D., &amp; Rohan, A. (2012). Association between neighborhood characteristics and physical activity among youth within rural-urban commuting areas in the US. <i>Maternal &amp; Child Health Journal, 16</i>, 258-267.</p>	<p>The purpose of this study is to examine the effects of neighborhood characteristics on youth physical activity within different types of urban-rural settings.</p>	<ul style="list-style-type: none"> <li>• 2007 NSCH used, restricted to 10-17 y/o (n= 45,392).</li> <li>• RUCA were given to define rural or urban areas based on the Census Bureau definitions.</li> </ul>	<ul style="list-style-type: none"> <li>• Analyzed 2007 NSCH data through a system called ANDRE to prevent inadvertent disclosure of confidential information.</li> </ul>	<ul style="list-style-type: none"> <li>• PA was more prevalent in youth living in most rural areas.</li> <li>• Found lack of association between presence of neighborhood parks and youth PA.</li> <li>• Neighborhood factors may be relevant for achieving a basic level of PA, they appear to be less important influences on children reaching their minimum PA.</li> </ul>	<p>The authors state that having the NSCH expanded to included questions about amenity features of neighborhoods and parks could help to determine how much of an influence they have on youth reaching their PA recommendations.</p>
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PHYSICAL ACTIVITY PARTICIPATION OF CHILDREN AND YOUTH

<p>Monnal, S., Lounsbery, M., McKenzie, T., &amp; Chandler, R. (2016). Associations between demographic characteristics and physical activity practices in Nevada schools. <i>Preventive Medicine, 95</i>, 4-9.</p> <p>2, 5</p>	<p>The purpose of this study is to examine the associations between multiple school demographic characteristics and 16 specific PA practices in elementary, middle, and high schools in Nevada. School practices related to general wellness, PE, recess, before and after school activities facilities and support for active transport were examined.</p>	<p>Web-based surveys were distributed by the district superintendents' offices to all Nevada K-12 public school principals in fall 2014 to determine schools PA practices.</p>	<ul style="list-style-type: none"> <li>• Binary logistic regression was used to determine the odd ratios (OR).</li> <li>• 95% CI was used for associations between school demographic characteristic and each school PA practice.</li> <li>• Results were compared with the random-effects multilevel regression models.</li> <li>• Ordinary least squares (OLS) regression was used to determine associations between school demographic characteristics and total count of PA practices.</li> </ul>	<ul style="list-style-type: none"> <li>• There were not significant demographic disparities found in 10 of the 16 PA examined.</li> <li>• Low-SES schools are more likely to provide after-school PA programs, which shows a promise that SES disparities in PA will be reduced.</li> </ul>	<p>The authors recommend that further research is need to understand the role of other potential school-level factors, such as principal decision-making and site-based management practices on difference in PA practices.</p>
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PHYSICAL ACTIVITY PARTICIPATION OF CHILDREN AND YOUTH

<p>Paxton, R., Estabrooks, P., &amp; Dziewltowski, D. (2013). Attraction to physical activity mediates the relationship between perceived competence and physical activity in youth. <i>Research Quarterly for Exercise and Sport, 75, 107-111.</i></p> <p>5</p>	<p>The purpose of this study is to determine the relationships that exist between rural youth's perceptions of physical competence, attractions to PA, and PA behavior.</p>	<ul style="list-style-type: none"> <li>• Four 4-H clubs (Head, Heart, Health, &amp; Hands) from two separate rural communities from a midwestern state.</li> <li>• 97 youth participants, but only 63 participants provided parental consent (66.5% response rate).</li> <li>• Aged 9-11 years old, all participants were Caucasian and 66% were girls.</li> </ul>	<p>Physical Activity Questionnaire for Older Children (PAQOC: grades 4-8) was used to assess PA.</p>	<p>The relationship between perceived physical competence and PA is mediated by attraction to PA.</p>	<p>The authors suggest two possible avenues for future research. One, development of promotional strategies that target perceptions of competence and attractions to PA for 4-H clubs. Two, the intervention described within the study could be used to determine if attraction and competence are successful mediators of behavior change.</p>
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PHYSICAL ACTIVITY PARTICIPATION OF CHILDREN AND YOUTH

<p>Swanson, M., Schoenberg, N., Erwin, H., &amp; Davis, R. (2012). Perspectives on physical activity and exercise among Appalachian youth. <i>Journal of Physical Activity and Health, 9, 42-47.</i></p> <p><b>3, 5</b></p>	<p>The purpose of this study is to examine Appalachian youth's perspectives on PA to provide information for the development of effective and acceptable PA intervention in other rural regions.</p>	<p>11 focus groups with 63 children were used. 4 focus groups with children 8-10, 4 groups of children 15-17, and 3 groups with children 11-14 years old. Focus groups were small (4-6 participants) and made up of both boys and girls.</p>	<ul style="list-style-type: none"> <li>• Focus groups which were tape recorded. Member checks were also conducted. All tape-recorded sessions were transcribed by local trained transcriptionists and reviewed for accuracy</li> <li>• Transcripts were imported into NVivo for coding, organization and analysis.</li> </ul>	<ul style="list-style-type: none"> <li>• There are several perspectives that emerged from the focus groups on the distinction of PA and exercise,</li> <li>• Appalachian residents do not benefit from the same facilitators as their urban counterparts when it comes to PA (sidewalks, recreational facilities and organized leisure activities.</li> <li>• Addressing low PA levels requires community input and creative programming.</li> </ul>	<p>Further research should be done in Appalachian and other disadvantaged regions, which should include best practices in community-based programming and research. This is to ensure that local perspectives are being incorporated into their PA promotions.</p>
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PHYSICAL ACTIVITY PARTICIPATION OF CHILDREN AND YOUTH

<p>Vermeesch, A., Ling, J., Voskuil, V., Bakhoya, M., Wesolek, S., Bourne, K., Pfeiffer, K., &amp; Robbins, L. (2015). Biological and sociocultural differences in perceived barriers to physical activity among 5<sup>th</sup>-7<sup>th</sup> grade urban girls. <i>Nursing Research, 54</i>, 342-350.</p> <p>2, 3, 4</p>	<ul style="list-style-type: none"> <li>• This study has three purposes.</li> <li>• To determine the pubertal stage, racial/ethnic and SES difference in ratings of interference of barriers to PA.</li> <li>• To examine relationships between perceived barriers and age, BMI, recreational screen time, sedentary activity, and PA.</li> <li>• To identify girls' top-rated perceived barriers to PA.</li> </ul>	<ul style="list-style-type: none"> <li>• 509 girls from eight Midwestern U.S schools participated in this study. Participants demographic, pubertal stage, perceived barriers, and recreational screen time data were collected by the use of surveys. Height and weight of each participant was measured and accelerometers were used to measure sedentary activity, MVPA and light plus MVPA.</li> <li>• Data collection was done via iPad delivered surveys. Each girl completed the Pubertal Development Scale behind a privacy screen and afterwards the girls watched an instructional video on wearing their accelerometer and given their accelerometer, along with written instructions to share with their parents/guardians.</li> </ul>	<p>SPSS, independents sample t-tests and one-way ANOVA examined biological and sociocultural differences in BMI, recreational screen time, sedentary behavior, PA and perceived barriers</p>	<ul style="list-style-type: none"> <li>• Barriers such as lack of skill, hating to sweat, difficulty finding programs, being tired, and having pain interfere with PA both before and after puberty continue to represent a major challenge.</li> <li>• Designing interventions that will assist girls to overcome these barriers may help in increase PA among urban girls</li> </ul>	<ul style="list-style-type: none"> <li>• The authors suggest that future research is needed to design and test interventions that are tailored to meet the needs of various subgroups of girls. These interventions are needed to target perceived barriers to PA.</li> <li>• The authors also suggest that assisting parents in how to encourage their daughters to participate in PA and overcome their barriers is needed</li> </ul>
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