

SOURCES OF SOCIAL SUPPORT, PHYSICAL ACTIVITY AND SPORTS
PARTICIPATION IN MIDDLE SCHOOL CHILDREN

by

Sarah Conklin
A Thesis
Submitted to the
Graduate Faculty
of
George Mason University
in Partial Fulfillment of
The Requirements for the Degree
of
Master of Science
Educational Psychology

Committee:

Amos H. Kibuka Chair

Sam R. Shubert

Richard E. Sprague

Amos H. Kibuka Program Coordinator

Mark A. Jurek Dean, College of Education
and Human Development

Date: June 2, 2011

Spring Semester 2011
George Mason University
Fairfax, VA

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Children

A thesis submitted in partial fulfillment of the requirements for the degree of Master of
Science at George Mason University

By

Sarah Conklin
Bachelor of Arts
James Madison University, 2009

Director: Anastasia Kitsantas, Professor
Educational Psychology

Spring Semester 2011
George Mason University
Fairfax, VA

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DEDICATION

This is dedicated to my family and Billy Gould for their continued support and guidance throughout the thesis process.

ACKNOWLEDGEMENTS

I would like to thank my thesis committee chair, Dr. Anastasia Kitsantas for her guidance and mentorship throughout the thesis. Thank you thesis committee members Dr. Sheri Berkeley and Dr. Andrew Springer. A special thanks to Dr. Andrew Springer, Dr. Steve Kelder, and the Michael and Susan Dell Foundation for giving me the opportunity to use the CATCH Middle School Project baseline data. And thank you Megan Conklin for sparking an interest in childhood obesity, and connecting me with the Michael and Susan Dell Foundation.

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ABSTRACT

SOURCES OF SOCIAL SUPPORT, PHYSICAL ACTIVITY, AND SPORTS PARTICIPATION IN MIDDLE SCHOOL CHILDREN

Sarah Conklin, MS

George Mason University, 2011

Thesis Director: Dr. Anastasia Kitsantas

The present study investigated sources of social support (parent, friend, and teacher), physical activity, and sports participation with middle school children. It was hypothesized that social support would predict physical activity, the combination of the sources would predict higher levels of physical activity, and there would be differences across demographic variables (gender, ethnicity, parental language use). Results revealed that social support was a significant predictor of physical activity and sports participation, and the combination of the three social support sources predicted higher levels of physical activity and sports participation. There were differences based on gender, with females reporting higher levels of support for physical activity, and males reporting higher support for sports participation; ethnicity, with Caucasians reporting the highest levels of support; and parental language use, with Hispanics who speak English reporting

the highest levels of support. Recommendations for parents, teachers, and schools are discussed.

CHAPTER 1

In the past thirty years childhood obesity has more than tripled (CDC, 2010a). The prevalence of obesity in adolescents, ages 12 to 19, has increased from 5.0% in 1980 to 18.1% in 2008 (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010; NCHS, 2004). Adolescents who are overweight have an increased risk for high cholesterol and high blood pressure, and are more likely to become over weight adults (HHS, 2007). Further, adolescents may suffer immediate consequences such as social discrimination (HHS, 2007). One way adolescent's can lower their risk for obesity is by being physically active (CDC, 2010b; Strong, Malina, Blimkie, Daniels, Dishman, et. al, 2005). The Center for Disease and Control Prevention recommends children and adolescent's take part in 60 minutes of physical activity a day (CDC, 2010b).

Physical activity is any bodily movement that results in energy expenditure (Casperson, Powell, & Christenson, 1985). The benefits of physical activity include reduced risk of cardiovascular disease, reduce risk of diabetes, stronger bones and muscles, improved mental health, and improved academic performance (Strong et al., 2005; CDC, 2010b). Even though the benefits of physical activity are apparent, there is still a decline in physical activity during adolescence (Strong et al., 2005; Trost et al., 2002). Researchers suggest that social-level factors, such as those from family, peers, schools, and neighborhood, act together with individual level factors to influence

physical activity participation (Duncan, Duncan, Strycker, & Chaumeton, 2004; Castelli & Erwin, 2007) . One social factor that has consistently shown to be related to physical activity is social support (Beets, Vogel, Forlaw, Pitetti, & Cardinal, 2006; Beets, Vogel, Chapman, Pitetti, & Cardinal, 2007). Social support is any behavior that aids an individual in reaching a desired goal or outcome (Taylor, Baranowski, & Sallis, 1994). First, the literature on the link between social support and physical activity will be explored, and then the literature on differences in social support across gender, socioeconomic status, ethnicity, and parental language use will be examined.

The Link Between Social Support and Physical Activity

Social support has been found to be positively-related with physical activity (Sallis, Prochaska, & Taylor, 2000; Duncan, Duncan, & Strycker, 2005). Individuals who receive social support from a variety of sources including, parents, and friends report higher levels of enjoyment for physical activity participation (Heiltzer et al., 2010), higher levels of actual physical activity participation (Sallis et al., 2000), and reduced levels of sedentary behavior (Springer, Kelder, & Hoelscher, 2006). Social support can be provided through a number of behaviors including role modeling, participating in activities with the individual, and encouraging physical activity participation.

Researchers who have studied the relationship between social support and physical activity have identified multiple types of social support including tangible/intangible, direct/indirect, emotional/motivational, instrumental, and role modeling (Beets, Cardinal, & Alderman, 2010; Beets et al., 2006; Duncan et al., 2005). For the purpose of this study, social supportive behaviors will be divided into

instrumental, emotional/motivational, and observational behaviors. Instrumental support refers to behaviors that directly aid participation in physical activity, such as transportation to sports, and engagement with the individual during physical activity (Prochaska, Rodgers, & Sallis, 2002). Emotional or motivational support refers to encouragement, praise, and information about physical activities. Observational support refers to role modeling appropriate health behaviors (Prochaska et al., 2000). Parents, friends, and teachers are three sources that can provide social support.

CHAPTER 2

Parents

Parents have been an important focus of social support and physical activity research. Children spend roughly 18 years with their parents, and during this time parents have the ability to influence their child's health-enhancing and health-compromising behaviors (Perry, Crockett, & Pirie, 1987). For example, parents can promote health-enhancing behaviors by providing transportation to physical activities, or compromise health behaviors by promoting sedentary behaviors, such as television watching. Numerous studies have examined the role of parental social support and which supportive behaviors influence physical activity the most.

Beets et al. (2010) conducted a literature review of 80 studies that examined of the role of parental social support and physical activity related behaviors. For the purpose of their literature review, they identified four types of social support that were consistent across the parental support literature - instrumental, conditional, motivational, and informational. Instrumental and conditional support made up the broader category tangible support, and motivational and informational support made up the broader category intangible support. A fifth category, composite measure, was added to capture any study that examined social support as a composite score. Their results indicated that overall parental social support had a positive relationship with physical activity.

Instrumental support refers to access to places where children can engage in physical activity participation, transportation availability, and ability to pay fees or purchase equipment. Out of the studies reviewed by Beets and colleagues (2010) 17% indicated findings connecting physical activity participation to the provision of transportation. Transportation was one of the most common forms of social support reported by parents. Few studies examined how purchasing equipment and payment of fees is related to physical activity. However, payment of fees has been related to higher PA levels for boys (Sallis et al., 1999), and purchasing of equipment for sport related activity was more common for boys than girls (Fredricks & Eccles, 2005).

Conditional support refers to participating in activities together, and watching or supervising physical activities. Out of the studies reviewed by Beets and colleagues (2010) 27% reported a relationship between parents performing the activity with and the physical activity participation of their children/adolescents. That is, parents who were directly involved in activities with their children reported increased levels of physical activity (Beets et al., 2007). In addition, 9% of the studies reported a relationship between parental watching/supervision and physical activity. Parents can influence their child's PA by directly participating in activities or by watching and supervising PA.

Motivational support refers to parental encouragement and praise. Approximately half (47%) of the studies in the Beets et al. (2010) review examined encouragement. Encouragement can be defined as, "motivational prompts or suggestions provided by parents to foster the involvement of their child in activity (Beets et al., 2010, p.633)." Encouragement was found to be positively related to many physical activity related

behaviors including, intensity of activity, amount of activity, after school activity and sports, attraction to sports and games, intentions to be active, and sports participation. Praise has been less researched; however, the few studies (6%) that examined praise found that praise was associated with increased activity levels. The motivational studies reviewed indicate that encouragement may be the most influential form of motivational support.

Informational support is less studied. The majority of the studies that have examined informational support have examined it in combination with other supportive behaviors and used a composite measure of social support. Therefore, it is hard to determine the relationship of informational support and physical activity participation. However, V. J. Thompson et al., 2003 suggest that African American girls receive information from their parents on the importance of a healthy weight and the benefits of physical activity. However, it is unclear how this links to actual activity levels. Also, Duncan et al. (2005) reported that older children receive more informational support. This could be due to the fact that younger students are not able to process sports directions as easily.

Studies that examined social support as a composite measure offer less information regarding which social supportive behaviors are most effective. However, overall parental social support appears to be positively correlated with higher levels of physical activity. In addition, students who are more active report higher levels of perceived support (Davison, 2004). The literature review conducted by Beets et al. (2010) provides evidence of the benefits of parental social support on physical activity, and also

gives insight into which supportive behaviors specifically influence physical activity participation. Their results suggest the importance of parental encouragement, providing transportation, and participating in activities together to increase physical activity participation. Other researchers have studied these supportive behaviors and found positive relationships with physical activity.

For example, Wright, Wilson, Griffin, and Evans (2010) conducted focus groups with sixth grade students to assess how parental role modeling and parental social support influence physical activity. Questions were developed to assess the role of parental social support and role modeling on physical activity in underserved adolescents. Results indicated that both boys and girls reported receiving more tangible support, such as rides to physical activities, than emotional or forced support. Girls were the only group who reported receiving emotional support, and forced support, such as being forced to play outside with siblings.

Participants also provided suggestions on how to increase parental social support (Wright et al, 2010). Both boys and girls reported the desire for more tangible support from parents. Boys reported wanting their fathers to be more physically active with them, and girls reported the desire to be signed up for more sports. This finding is not surprising considering that sports participation levels are higher for boys than girls (Johnston, Delva, & O'Malley, 2007). Boys also reported the desire to have more emotional support from parents. Both boys and girls wanted their parents to be more creative when engaging in activities with them. Both boys and girls also suggested that having more money would help increase participation in physical activities. Conducting

focus groups allows students to speak more openly about the role of parental social support and physical activity. The findings from this study have promising suggestions for how to increase parental social support and physical activity participation.

Similar, Kubik, Lytle, and Fulkerson (2005) conducted focus groups with high school students to explore factors that influenced their eating and physical activity behaviors. Questions focused on the factors that influence physical activity participation and food choice, as well as the conditions that make it easier or harder to be physically active and eat healthy. At the end of the focus groups the students gave suggestions on how schools could foster physical activity participation and healthy eating. Student's identified convenience, availability, and cost as the factors that most influenced food choices. Students reported social support and role modeling from friends and adults as factors that influenced physical activity.

Student's reported barriers to physical activity included cost, access, limited space and equipment, busy schedules, and for girls, a lack of understanding of the equipment. Recommendations to promote physical activity and healthy food choice included more opportunities to eat healthy, for example healthy, affordable vending machines, and more opportunities to take part in physical activities during school time. Identifying barriers to physical activity as well as influences on physical activity is one way researchers can increase physical activity. Youth's desire to be more physically active is a promising finding that suggests there are ways to increase physical activity and increasing social support may be one option.

Dowda, Dishman, Pfeiffer, and Pate (2007) followed girls from 8th to 12th grade to examine family support for physical activity. Participants reported perceived family support, physical activity attitudes, perceived behavioral control, and self-efficacy for physical activity. Physical activity was assessed using the 3-Day Physical Activity Recall, which asks participants to recall their physical activity behaviors from the past three days. Scores were then translated into METs per day. MET values are formed to determine intensity of physical activity and to compare physical activity levels. Their results indicated that girls who reported higher perceived family support at the 8th grade level had higher MET scores at the 12th grade level despite their self-efficacy beliefs and perceived behavioral control. In addition, an increase in family support was related to an increase in total METs, and a decrease in family support was related to a decrease in total METs. This study suggests that interventions aimed at increasing physical activity during adolescence should include a family support component.

Many researchers have been interested in the role of social support and physical activity during adolescence. Springer et al. (2006) examined social support, physical activity, and sedentary behavior among 6th grade girls. Baseline data from the IMPACT Study (Incorporating More Physical Activity and Calcium in Teens) was used to assess Moderate-to-Vigorous Physical Activity (MVPA) and Vigorous Physical Activity (VPA), amount of sedentary behaviors, and parent and friend social support through encouragement and participation in physical activities together. Their results indicated that family and friend physical activity participation and encouragement were related to higher daily minutes of MVPA. That is, students who reported family and friend physical

activity participation and encouragement had a higher amount of daily MVPA minutes. The only variable related to VPA was friend encouragement. For sedentary behaviors, parents' participating in activities was inversely related to sedentary behaviors. Their study suggests the importance of multiple support sources to increase physical activity. In addition, encouragement and engagement in physical activities are key supportive behaviors that relate to physical activity.

Similar, Beets et al. (2006) examined the physical activity related behaviors of fifth to eighth grade students. They were interested in examining the role of the provider (parents or peers) of social support and the type of social support (transportation, encouragement, praise, and participation in physical activities). Participants completed a social support questionnaire that assessed parents - praise, transportation, encouragement, do activities with, and watched, and peers – encouragement of child, child encouragement of peers, do activities with, and praise. The physical activity measure included the number of days per week the participant engaged in vigorous physical activity (VPA), moderate physical activity (MPA), and the number of organizational sports a month the participant was involved in.

Results indicated that boys reported greater amounts of praise, transportation, do activity with, and watching (Beets et al., 2006). Their findings indicate gender differences in level and type of social support behavior. The two types of support that were related to physical activity were transportation and praise. The only provider of social support related to physical activity was peers. Although the only provider related to physical activity was peers, instrumental supportive behaviors provided by parents including

transportation and praise, were related to physical activity. These findings suggest that as students get older they still need the support of their parents, however, they may be less likely to report their reliance on their parents.

Beets et al. (2007) examined the role of parental social support and children's outdoor physical activity. Participants were 3rd to 5th grade students who attended a rural elementary school. Weekday and weekend activity were measured with pedometers, and total number of steps was averaged for weekday activity (Monday to Friday) and weekend activity (Saturday morning to Monday morning). Both mothers and fathers completed a questionnaire that assessed four social support behaviors encouragement, watching, playing with, and family use of outdoor play as recreation. Amount of physical activity was greatest on the weekend for both boys and girls. For boys, a positive association was found between fathers who engaged in physical activities with their sons and increased activity levels on the weekend in boys. For girls, mothers' outdoor recreation was positively related with girls' weekday activity. For both girls and boys the explicit role modeling of physical activities was correlated with increased activity levels. It is important that parents support physical activity on the weekdays and weekends so students meet the recommendations for physical activity.

While some researchers have been interested in strictly social support, other researchers have examined social support along with other physical activity correlates to determine the effect on physical activity. Shores, Moore, and Yin (2010) examined three important correlates of physical activity - access to physical activity areas, physical activity self-efficacy, and social support. The purpose of the study was to see how each

correlate acted on physical activity independently, but to also examine the interaction effect of the three variables.

Participants in grades 4, 8, and 11 reported their self-efficacy, social support, and social influence for physical activity, and also the number of locations that were available for physical activities (Shores et al., 2010). Physical activity was measured using the Physical Activity Questionnaire for Older Children (PAQ-C). Results indicated that higher levels of self-efficacy, social support, and access were positively related to PA participation. The most dramatic drop in physical activity occurred when social support and access to locations to be physical activity were not present. That is, students who were missing social support, especially access to areas to be physically active, had a greater decline in physical activity. This study demonstrates the importance of social support for physical activity across all grade levels.

Other researchers have also been interested in the role of social support and self-efficacy. Trost et al. (2003) evaluated a model that linked parental physical activity orientations, parental support for physical activity, and children's self-efficacy perceptions with physical activity participation. Parents completed a questionnaire that assessed their physical activity habits, supportive behaviors for physical activity, beliefs regarding the importance of physical activity, and parental enjoyment of physical activity. Children (grades 7-12) reported physical activity participation and physical activity self-efficacy. Their results indicated that in general parental support was low, with parents taking part in social supportive behaviors less than twice a week. Parental physical activity, parental enjoyment, and perceived importance of physical activity were

all positively correlated with parental support, however, not to physical activity. Parental support was related to child physical activity directly and indirectly through promoting self-efficacy. This study reiterates the importance of parental social support and physical activity. In addition, it illustrates how parents can still provide social support even if they are unable to directly participate in physical activities with their children by promoting physical activity self-efficacy.

Studies that explored social support with other psychosocial variables provide evidence for the importance of parental social support. Even when other social variables like self-efficacy, and perceived control were present social support still had the greatest impact on physical activity. Parental social support has been consistently correlated with physical activity (Beets et al., 2007; Wright et al., 2010), however, there are other providers of social support.

Friends

Friends can provide support through modeling, encouragement, watching, and participating in physical activities together (Duncan et al., 2005). Duncan et al. (2005) explored the sources and types of social support in youth physical activity. Each child (10-14 years) and their parent completed surveys that assessed five social support behaviors (encouragement, watching, participating with, informational support, and transportation). In order to determine physical activity engagement participants wore pedometers and completed surveys that reported the amount of global and vigorous physical activity. Overall, their findings indicated that social support was positively related to physical activity. The social support source that had the most influence on the

individual was friends. Participants who perceived a higher level of support from friends for physical activities had a higher level of physical activity. Participants who reported that their friends, parents, or siblings frequently watched them engage in physical activity also had higher levels of physical activity. Watching participants engage in sports was the only significant finding for type of support.

Voorhees et al. (2005) examined the role of peer social network factors and physical activity in adolescent girls. Social network refers to the specific friends an individual associates with as opposed to a global measure of “peers.” Participants reported their experiences in participating in physical activities with three of their closest friends. Physical activity was measured using the Physical Activity Questionnaire for Older Children (PAQ-C). Their results indicated that girls who had more physically active friends reported higher levels of physical activity. Specifically, girls that reported engaging in physical activities with their friends more often had higher physical activity scores. That is, girls that engaged in physical activities with their friends reported the higher levels of overall physical activity. This finding is important for girls who are less social because they have fewer opportunities to participate in physical activities with friends, which might also reduce their physical activity during leisure time. This study suggests the importance of having a friend to engage in physical activities.

Although few studies have examined strictly peer support, a few have examined peer support along with parental support. Beets et al. (2006) and Springer et al. (2006) examined the influence of parental and peer social support on physical activity. Beets et al (2006) found that peer social support had a greater impact on physical activity than

parental social support in children grades 5th-8th. Similar, Springer et al. (2006) found that peer social support was an indicator of MVPA and VPA while parental social support was only an indicator of MVPA in sixth-grade girls. Their findings indicate that, as children get older, peers have a greater influence on physical activities. This is significant considering the decline in physical activity during adolescence.

Friends can play a vital role in increasing physical activity participation levels. Friends who watch or participate in activities together have higher levels of physical activity. Researchers interested in increasing physical activity should encourage students to participate in activities with their friends and to watch their friends participate in sports in order to demonstrate their support. This is especially important during adolescence a time when students are heavily influenced by their peers.

Teachers

There are very few studies that have examined teacher support for physical activity. Grieser et al. (2008) examined black, Hispanic, and white sixth grade girls' perceptions of social support for physical activity within the school, social support for physical activity outside of the school (parents and friends), and enjoyment in physical activity and physical education. Approximately 1400 female participants, who were part of the Trial of Activity for Adolescent Girls (TAAG), reported their perceived school climate for girls' physical activity, physical education and physical activity enjoyment, and social support for physical activity by friends and parents. Results indicated that black and Hispanic girls perceive less social support from teacher and other boys in the school; however, there were no racial or ethnic differences in perceived support from

friends or other girls at school. Black girls also reported a greater enjoyment from PE classes than white girls, however they reported a lower enjoyment for physical activity. Their findings suggest that students may be perceiving teacher's social supportive behaviors differently. In addition, their findings suggest there may be gender, and ethnic differences related to teacher support.

Wechsler, Davis, Devereaux, and Collins (2000) reviewed the role of environmental factors and physical activity and suggested five ways the school environment can promote physical activity and healthy eating. The five additional factors they suggested to influence physical activity included (a) recess periods, (b) intramural sports and physical education, (c) facilities that support physical education, (d) food and beverages available at the school outside of the cafeteria, and (e) psychosocial support through policies, administrative attention, staff development, health promotion services, and audiovisual cues and incentives in the school environment. With regard to psychosocial support, they suggested that role modeling was one of the most important ways to increase physical activity. Students spend a great amount of time in contact with their teachers, therefore, teachers have the opportunity influence their students physical activity related behaviors.

The research on teacher social support and physical activity is scarce. Since students do spend a large amount of time in contact with their teachers, it is important to examine their influence on physical activity. Understanding the role of teacher social support and physical activity will allow researchers to provide teachers with suggestions on ways to increase physical activity levels in students.

The Relationship between Social Support and Physical Activity across Gender, SES and Ethnicity

Differences in physical activity participation levels by gender, SES, and ethnicity have led researchers to examine the relationship between social support and physical activity across gender, SES, and ethnicity. Although some studies have examined the relationship of social support and physical activity across gender and ethnicity, results have been inconsistent. There is a need for research to clarify the relationship of social support and physical activity among these key socio-demographic variables.

Gender. Research consistently shows that males have higher physical activity levels than females (Gordon-Larsen, McMurray, & Popkin, 1999; Sallis et al., 2000; Trost et al., 2002, Trost et al., 2003). Gordon-Larsen et al. (1999) examined data from the 1996 National Longitudinal Study of Adolescent Health (grades 7-12), which consisted of two waves of data collection taken a year apart. They found that PA participation (≥ 5 bouts of moderate to vigorous physical activity per week) was highest for males and lowest for females and minority adolescents. That is, across two years of data collection males reported higher levels of moderate to vigorous physical activity.

Further, Sallis et al. (2000) conducted a review of the correlates of physical activity of children and adolescents ages 3-18. They found that across all ages males consistently had higher levels of physical activity. Similarly, Trost et al. (2002) examined age and gender differences in objectively measured physical activity. As opposed to self-reported physical activity measures, participants' wore accelerometers to obtain an objective measure. They found that across grades 1 through 12 males were more active

than females. This study is significant because an objective measure of physical activity was used, and the results still suggested gender differences in physical activity. Obvious gender differences in levels of physical activity participation have led researchers to examine gender differences in social support.

Davison (2004) examined gender differences in the activity-related support from parents, peers, and siblings and middle school student's physical activity. Participants completed the Activity Support Scale (ACTS) which was developed to assess social support for physical activity. Physical activity was measured by the Children's Physical Activity scale (CPA), the physical activity subscale of the Physical Self Description questionnaire, and an activity checklist that indicated the total number of activities the participant had been involved with in the past year. Results indicated that in general social support across the sources was positively correlated with physical activity. Both boys and girls who reported higher levels of activity also reported high levels of parental logistic support, peer support, and sibling support. Middle school boys and girls both reported having higher levels of physical activity when receiving high levels of social support from at least one parent. There were no observed gender differences, however, this is not consistent with recent research that suggest boys and girls report different levels and types of social support (Beets et al., 2006; Beets et al., 2007).

Beets et al. (2006) examined the influence of the provider and type of social support on physical activity. Boys reported receiving higher levels of social support. Specifically, boys reported higher levels of praise, transportation, do activity with, and watching than girls. Boys reporting higher levels of perceived social support could be one

reason boys have higher levels of physical activity participation. Further, research suggests that boys may not perceive more support they may actually receive more support. Trost et al. (2003) examined a model of parental influence on physical activity and found that parents reported significantly higher levels of social support and perceived importance for boys compared to girls. Their findings suggest that parents may provide social support differently based on the gender of the child.

Beets et al. (2007) examined the role of parental support and outdoor activity. Their results indicated that for boys, fathers who engaged in physical activities with their sons was positively associated with increased activity levels on the weekend. For girls, mothers' outdoor recreation was related with girls' weekday activity. Although both boys and girls physical activity was related to social support the findings suggest that boys and girls are affected by different social supportive behaviors. Boys may benefit more from direct engagement in physical activities, while girls may be more influenced by role modeling.

Social support is an ideal place to start for identifying gender differences in physical activity. The literature suggests boys and girls identify with different social support behaviors and providers. Identifying which social supportive behaviors and providers influence physical activity the most among girls will help researchers plan interventions that increase physical activity in girls and close the physical activity gap between boys and girls.

Socioeconomic Status. Socioeconomic status has been defined, “a composite measure that typically incorporates economic status, measure by income; social status,

measured by education; and work status, measured by occupation (Dutton & Levine, 1989, p.30).” Studies that have examined physical activity and SES suggest that higher SES is associated with higher levels of physical activity (Ford et al., 1991; Pratt, Macera, & Blanton, 1999). Ford et. al, found that men and woman who had a higher SES took part in more leisure time physical activity than men and woman of a lower SES. Similar, Pratt et. al, examined three national health surveys for adults and youth to determine physical activity and inactivity patterns. Their results indicated that families with a higher income and higher education level were more physically active. Moreover, Gordon-Larsen, Nelson, Page, and Popkin (2006) examined environmental factors that were associated with physical activity. Their results indicated that participants of a lower SES had less access to places to be physically active which in turn reduced physical activity levels. In addition to lower physical activity levels, low SES students also report lower levels of sports participation. To my knowledge there are no studies have examined social support across SES.

Ethnicity. Differences in physical activity participation also vary by ethnicity. Hispanic and African Americans report the lowest levels of physical activity participation and the highest levels of inactivity (Gordon-Larsen et al., 1999; Sallis et al., 2000). Data from the Add health study, which examined adolescent health behaviors, found that non-Hispanic black and Hispanic adolescents had higher levels of inactivity, and the lowest level of physical activity participation (Gordon-Larsen, McMurray, & Popkin, 2000). Moreover, non-Hispanic white females had much higher levels of moderate to vigorous physical activity than minority females. Similar, Crespo, Smit, Andersen, Carter-Pokras,

and Ainsworth (2000) examined data from the Third National Health and Nutrition Examination Survey, and found that Mexican-Americans reported the highest level of inactivity followed by African-Americans. Black, and Hispanic students have also reported lower levels of sports participation (Johnston et al., 2007). Studies that have examined social support and physical activity have also found ethnic differences but the results have been inconsistent.

Grieser et al. (2008) examined black, Hispanic, and white sixth grade girls' perceptions of social support for physical activity within the school, social support for physical activity outside of the school (parents and friends), and enjoyment in physical activity and physical education. Their results indicated that compared to white girls, black girls reported significantly lower levels of perceived teacher support and physical activity enjoyment. In addition, Hispanic girls reported low levels of physical activity enjoyment, less perceived support for physical activities from boys, and also less perceived support from families than white girls. Their findings suggest that both black and Hispanic girls report lower levels of perceived support from at least one source, whether it is parents, peers, or teachers.

In contrast, Felton et al. (2002) explored differences in physical activity between black and white girls living in rural and urban areas and found that black girls reported higher family support for physical activities. Specifically, black girls reported higher levels of family engaging in physical activities or sports with them, and family telling them the importance of physical activity. However, white girls reported having access to more sports equipment and having a feeling of safety in their neighborhood. Their

findings suggest that black girls receive more social support from their family, however, they have less access to physical equipment and neighborhood factors may thwart outdoor physical activity.

Lown and Braundschweig (2008) examined determinants of physical activity in low-income, overweight African American girls. Girls in grades 3-8 completed questionnaires that assessed physical activity, sedentary behaviors, and psychosocial influences, such as social support, health beliefs regarding physical activity outcomes, and physical activity self-efficacy. Social support from parents and peers was associated with a greater intent for physical activities. This implies that differences in social support across ethnicities may be manifested in the type of social supportive behavior.

It is essential for researchers to continue identifying differences among ethnic groups. If researchers can identify the social supportive behaviors that have the most influence over inactive ethnic groups, they may be able to increase physical activity. Understanding how correlates of physical activity differ by ethnicity will help researchers plan interventions that encourage physical activity across all ethnicities.

Parental Language Use. In addition to physical activity differences by ethnicity, physical activity differences by parental language use, often used as an acculturation measure, have also been observed. Parental language refers to the language that is most often used between parent/guardian and child. Springer et al. (2009) examined PA participation by parental language use in 4th, 8th, and 11th grade students in Texas. The parental language variable was broken down by Hispanic students who speak Spanish with parents, Hispanic students who speak English with parents, and all other

ethnic groups who speak English with parents. Spanish-Hispanic girls reported the lowest levels of participation in vigorous PA (except 4th grade), sports team participation, and other structured PA followed by English-Hispanic and English-other girls across all grade levels. Fewer differences were observed for boys, however English-Hispanic and English-Other boys were approximately two times more likely to take part in sports teams at school compared to English-Hispanic. These findings suggest that Hispanic students who speak Spanish at home are less likely to be PA than English speaking Hispanics. In addition, they also suggest that the language usage-PA relationship may have different implications based on gender.

Similar, Liu, Probst, Harun, Bennett, and Torres (2009) examined data from the 2003 National Survey of Children's Health to explore acculturation, physical activity, and obesity among Hispanic adolescents. Parents reported information about their child's health and health care. Participants (ages 10-17) generational status and primary language use were used to measure acculturation. Results indicated that children whose primary language was not English were more likely to fail to meet physical activity recommendations. Specifically, students in homes where English was not the primary language failed to meet physical activity recommendations approximately 42% of the time, as opposed to students in homes where English was the primary language failing to meet recommendations 30% of the time. First generation Hispanics were also at a higher risk for not obtaining physical activity recommendations. Even though physical activity levels differ by parental language use there has been no research that investigates the relationship between social support and parental language use.

The purpose of this study is to examine the relationship of physical activity and social support from parents, friends, and teachers, across gender, SES, ethnicity, and parental language use in 8th grade students. Physical activity and sports participation across ethnicity, gender, SES and parental language use will also be explored. This study is significant because it examines three social support sources (parents, friends, teachers), which few studies have done in the past. In addition, the relationship between social support and physical activity across parental language use has not been explored in the literature.

Research Questions

1. Does source (parents/guardian, teacher, friend) of social support predict participation in physical activity and sports across ethnicity, gender, SES, and parental language use?
2. Are there differences between ethnic (African-American, Caucasian, Hispanic, and Other), gender, SES (poor, nearly poor, living comfortably, well off, and), and parental language use (Hispanics that speak Spanish, Hispanics that speak English, all other English speaking students, and Other) in physical activity and sports participation?

The following hypotheses were formulated: First it was hypothesized that social support will predict physical activity and sports participation. Second, it was expected that the combination of the three sources of social support will predict higher levels of physical activity. Third, it was also expected that there will be differences based on ethnicity, gender, SES, and parental language use, specifically males, white students,

higher SES students, and Hispanics who speak English would report higher levels of perceived social support. Finally, it was hypothesized these students will also report higher levels of physical activity and sport participation.

CHAPTER 3

Data Source

This study is based on a secondary analysis of baseline data from the Coordinated Approach To Child Health (CATCH) Middle School Study, a three and a half year, school-based intervention aimed at decreasing obesity by educating students on the importance of physical activity and health eating, and their influence on academics (CATCH, 2011). The CATCH intervention utilizes a holistic approach to child health that includes classroom teachers, school food service, physical education teachers, student's families, and the broader community (CATCH, 2011). The key resource for implementing CATCH is a coordination tool kit that provides simple doable tasks for all faculty and staff that serves as an aid for campus wide implementation of CATCH.

Participants completed a questionnaire based in part on the School Physical Activity and Nutrition (SPAN) questionnaire. The SPAN questionnaire stems from the School-Based Nutrition Monitoring (SBNM) surveillance instrument that was developed to assess nutrition and physical activity behaviors, as well as attitudes and knowledge among 4th, 8th, and 11th grade students (Hoelscher, Day, Kelder, & Ward, 2003). The SPAN questionnaire has been examined for reproducibility and validity. The target population for this study was 8th grade students who completed the SPAN questionnaire

during the spring of 2009. The sample comprised of 2,826 students from 30 public schools in central Texas.

Participants

The sample consisted of 2,826 (boys, $n = 1367$; girls, $n = 1448$) 8th grade students. Student's ages ($M = 13.90$, $SD = .59$) ranged from 11 to 16 years. Out of the total sample 98.2 % ($n = 2775$) provided information on their ethnicity (African-American = 12.9%, Hispanic = 51.0%, White = 24.7%, and other = 9.7%); 97.6% ($n = 2758$) reported the language they most used at home (English = 66%, Spanish = 28.1%, 3.6%); and 90.2% ($n = 2549$) reported socioeconomic status (Very well off = 14.5%; Living comfortably = 55.4%, Just getting by = 17.1%, Nearly poor = 2.2%, and poor = 1.0%). See table 1 for demographic characteristics.

Table 1. *Participant Characteristics as a Percentage.*

Characteristic	Boys (<i>n</i> = 1367)	Girls (<i>n</i> = 1448)	Total (<i>n</i> = 2826)
Age in years (mean, SD)	13.90 (.58)	13.85 (.59)	13.88 (.585)
Ethnicity (%)			
African American	15.2	11.2	12.9
Hispanic	49.5	54.1	51.0
White	24.9	25.4	24.7
Other	10.3	9.3	9.8
Language-Ethnic Group (%)			
Hispanic			
English	21.5	22.7	22.0
Spanish	24.5	29.4	27.7
English	48.5	42.0	43.9
Other	6.2	5.9	6.3
Socioeconomic Status (%)			
Very well off	17.1	15.3	14.5
Living comfortably	61.1	61.7	55.4
Just getting by	18.4	19.5	17.1
Nearly poor	1.9	3.0	2.2
Poor	1.7	.6	1.0

Measures

Demographic Variables. (Hoelscher et al., 2003). Participants reported their gender, ethnicity, and parental language use. Ethnicity was assessed with the question, “How do you describe yourself?” Options included Black or African-American; Mexican-American, Latino, or Hispanic; White, Caucasian, or Anglo; Vietnamese; Chinese; Indian or Pakistani; Other Asian; American Indian or Alaska Native; Native Hawaiian or other Pacific Islander; and Other (write in any other). Parental language used was assessed with the question, “What language do you use with your parents most of the

time? Fill in only ONE.” Parental language use options included English; Spanish; Vietnamese; Chinese; and Other (write in any other language). An ethnic-language variable was created using information from the demographic page. The ethnic-variable breakdown was as follows Hispanics that speak English, Hispanics that speak Spanish, all other students who speak English, and Other, for students speaking a language different than English or Spanish.

Socioeconomic Status. The socioeconomic status variable was taken from Gore, Aseltine, and Colton(1992). Socio-economic status was assessed with the question, “In terms of income, what best describes your family’s standard of living in the home where you live most of the time? Would you say your family is:” Answer options included very well off, living comfortably, just getting by, nearly poor, and poor. School socio-economic status will also be included.

Physical Activity. Physical activity was assessed with two questions adapted from the CDC Youth Risk Behaviors Survey (CDC, 2009; CDC, 2006). The first question measured global physical activity or moderate to vigorous physical activity (MVPA) and was based off CDC recommendations that suggest 60 minutes of physical activity a day. This question asked participants to record the number of days in the past 7 days they were active for at least 60 minutes. The second question assessed vigorous physical activity (VPA) outside of school time. It was based on past recommendations that suggest youth participate in 20 minutes of vigorous physical activity at least three days a week. This question asked participants to record the number of days in the past 7 days they took part in physical activity that made their heart beat fast and made them breathe hard. Both

physical activity questions had a correlation of .92 when examining reproducibility (Hoelscher et al., 2003).

Sports Participation. Two questions adapted from the Youth Risk Behavior Survey (CDC) were used to assess sports participation. One question focused on sports team participation run by the school, and one focused on sports team participation outside of the school. Sports team participation run by the school was measured by the question, “During the past 12 months on how many sports teams run by your school did you play?,” and sports team participation outside of the school with the question, “During the past 12 months, on how many sports teams run by organizations outside of school (like the park district, summer leagues, club leagues, YMCA, or church teams) did you play?” Answer options range from zero teams to three or more teams. Each sports participation question had high reproducibility, sports at school had a kappa level of .71, and sports outside of school had a kappa level of .60 (Hoelscher et. al, 2003).

Social Support. The social support scales were based on the Athletic Identity questionnaire (Anderson, Masse, & Hergenroeder, 2007). There were separate social support scales for parents, teachers, and friends.

Parent. The parent support scale asked students to rate how often their parents took part in specific social supportive behaviors. The question began with “I have parents who” and asked students to rate how often from never to always their parents took part in these behaviors. A few examples are, “I have parents who want me to exercise” and “I have parents who encourage me to do sports or exercise.” There were seven social support behaviors with a five point likert scale that ranged from never to always.

Exploratory factor analyses were conducted in order to determine which items on the parent support scale were relevant. Items were considered relevant to the scale if they met the following criteria; factor loadings were above .6. All seven items on the parent support scale yielded loadings above .6, and accounted for 63% of the total variance, Eigenvalue 4.25. Cronbach's alpha for parent support scale was $\alpha = .89$. Factor loadings are represented in table 2.

Friend. The friend social support scale asked students to rate how often their friends took part in specific social supportive behaviors. The question began with "I have friends who" and asked students to rate how often from never to always their friend took part in these behaviors. A few examples are, "I have friends who watch me when I exercise or play sports and give me positive feedback on what I'm doing" and "I have friend who exercise with me." There were five social support behaviors, with a five point likert scale that ranged from never to always. Exploratory factor analyses were conducted in order to determine which items on the friend support scale were relevant. Items were considered relevant to the scale if they met the following criteria; factor loadings were above .6. All five items on the teacher support scale yielded loadings above .6, and accounted for 79.8% of the total variance, Eigenvalue 4.00. Cronbach's alpha for the friend support scale was $\alpha = .91$. Factor loadings are represented in table 2.

Teacher. The teacher social support scale asked students to rate how often their teachers took part in specific social supportive behaviors. The question began with "I have teachers who" and asked students to rate how often from never to always their teacher took part in these behaviors. A few examples are, "I have teachers who spend

time teaching me to play a sport or do a physical activity” and “I have teachers who are willing to help me in every way when it comes to a sports or exercise.” There were seven social support behaviors, with a five point likert scale that ranged from never to always. Exploratory factor analyses were conducted in order to determine which items on the teacher support scale were relevant. Items were considered relevant to the scale if they met the following criteria; factor loadings were above .6. All five items on the teacher support scale yielded loadings above .6, and accounted for 76.1% of the total variance, Eigenvalue 5.33. Cronbach’s alpha for the teacher support scale was $\alpha = .95$. Factor loadings are represented in table 2.

Table 2
Factor Loadings for the Social Support Scales

Scale/Item	Factor Loading
Parents ($\alpha = .89$)	
1. I have parents who want me to exercise	.74
2. I have parents who exercise with me	.69
3. I have parents who encourage me to exercise	.81
4. I have parents who watch & give positive feedback when I exercise	.81
5. I have parents who spend time teaching me to play a sport or do physical activity	.76
6. I have parents who are proud of me when I exercise	.82
7. I have parents who are willing to help me exercise	.82
Friends ($\alpha = .91$)	
1. I have friends who want me to exercise	.88
2. I have friends who exercise with me	.86
3. I have friends who encourage me to do sports and exercise	.92
4. I have friends who watch and give positive feedback when I exercise	.90
5. I have friends who are willing to help me with exercise	.90
Teachers ($\alpha = .95$)	
1. I have teachers who want me to exercise	.84
2. I have teachers who exercise with me	.75
3. I have teachers who encourage me to exercise	.89
4. I have teachers who watch & give positive feedback when I exercise	.90
5. I have teachers who spend time teaching me to play a sport or do physical activity	.89
6. I have teachers who are proud of me when I exercise	.90
7. I have teacher who are willing to help me exercise	.91

Procedure

Baseline data were collected during the spring of 2009. Out of the 39 schools utilizing CATCH, 30 schools were randomly selected as evaluation schools. After the 30 schools were selected, 4-5 8th grade core classes (i.e, history, science, math) were randomly selected as measurement classrooms. Consent forms were sent home with students to be completed by parents. Once participants had consented, the SPAN questionnaire was administered during class time and height and weight measurements were also taken. The Central Texas CATCH Middle School Study study protocol and questionnaire was reviewed and approved by the Committee for the Protection of Human Subjects at the University of Texas School of Public Health as well as at George Mason University.

Analyses

Hierarchical multiple regressions were employed to determine if social support predicted physical activity and how much variance in MVPA, VPA, sports participation, and sports participation outside of the school could be accounted for by the combination of social support sources. In order to determine if demographic variables had an effect on the relationship between social support and physical activity interaction variables were created. Interaction variables were created by multiplying the demographic variable by the social support source, for example, gender X teacher support, ethnicity X friend support, or parental language X parent support. Interaction variables were created for each combination of demographic variable and social support source. Interaction

variables were then placed in multiple regressions to determine if the interaction was significant at predicting physical activity and sports participation. If the multiple regressions yielded significant interaction results correlation coefficients were examined to see which group (for example, Caucasians, Hispanics, or African-Americans) reported the strongest relationship between physical activity or sports participation and social support. Analyses of variance (ANOVA's) and pairwise t-test were used to determine if there were physical activity differences based on gender, ethnicity, parental language use, and SES. Pairwise t-test were employed when examining gender differences, and ANOVA's were employed when examining demographic variables with more than two groups for example, ethnicity, parental language use, and SES differences

CHAPTER 4

Descriptive Analyses

Preliminary analyses revealed that the SES measure did not match the percent economically disadvantaged of the school. For example, at two of the public schools included in the sample 64% and 95% of students are economically disadvantaged, however, less than 4% reported being poor or nearly poor. Since the SES measure did not match the SES of the school the measure was excluded from the analyses. Means and standard deviations for the social support sources are provided in Table 3. Means and standard deviations for physical activity and sports participation are provided in Table 4. Correlations were used to examine the relationships among the social support sources and physical activity variables (Table 5). Overall, significant relationships emerged between all of the social support sources and physical activity variables. More specifically, of the social support sources the strongest correlation with moderate to vigorous physical activity (MVPA) was friend social support ($r = .35$), followed by parental social support ($r = .33$). The strongest correlation with vigorous physical activity (VPA) was also friend support ($r = .33$), followed by parental support ($r = .30$). In contrast, the strongest correlation with number of sports teams was teacher support ($r = .37$), followed by friend support ($r = .34$). The strongest correlation between sports teams outside of school was with parental support ($r = .30$), followed by friend support ($r = .29$).

Table 3
Social Support Means and Standard Deviations

	Social Support Sources		
	Parent	Friend	Teacher
Total (<i>M, SD</i>)	2.33 (1.08)	1.97 (1.34)	1.48 (1.33)
Gender			
Male	2.27 (1.08)	1.99 (1.35)	1.47 (1.34)
Female	2.19 (1.08)	1.96 (1.32)	1.48 (1.32)
Ethnicity			
African-American	2.40 (1.10)	2.18 (1.34)	1.79 (1.42)
Hispanic	2.10 (1.08)	1.82 (1.31)	1.37 (1.28)
White	2.39 (1.05)	2.15 (1.34)	1.48 (1.35)
Other	2.23 (1.04)	2.03 (1.33)	1.57 (1.38)
Ethnic Language			
Hispanic			
English	2.36 (1.05)	1.90 (1.36)	1.90 (1.36)
Spanish	1.90 (1.05)	1.76 (1.28)	1.76 (1.28)
English	2.38 (1.06)	2.14 (1.34)	2.14 (1.34)
Other	2.07 (1.08)	1.99 (1.35)	1.99 (1.35)

Note. The social support scale ranged from

Table 4

Means and Standard Deviations for Physical Activity and Sports Participation

	Physical Activity		Sports Participation	
	Global PA	VPA	At School	Outside of School
Total (<i>M, SD</i>)	4.13 (2.28)	3.85 (2.30)	.99 (1.12)	.78 (1.00)
Gender				
Male	4.75 (2.19)	4.44 (2.27)	1.12 (1.14)	.91 (1.05)
Female	3.56 (2.22)	3.31 (2.19)	.86 (1.09)	.66 (.94)
Ethnicity				
African-American	4.72 (2.26)	4.28 (2.41)	1.63 (1.17)	1.07 (1.12)
Hispanic	3.75 (2.34)	3.51 (2.20)	.89 (1.07)	.69 (.97)
White	4.51 (2.22)	4.23 (2.30)	.96 (1.12)	.85 (1.00)
Other	4.22 (2.33)	4.00 (2.35)	.74 (1.01)	.67 (.94)
Ethnic Language				
Hispanic				
English	4.10 (2.22)	3.68 (2.27)	1.01(1.13)	.76 (1.00)
Spanish	3.51 (2.22)	3.40 (2.14)	.78 (1.00)	.64 (.92)
English	4.58 (.07)	4.26 (.07)	1.13 (.03)	.88 (.03)
Other	3.64 (.18)	3.54 (.18)	.84 (.09)	.84 (.09)

Note. Physical activity scales from 0 days per week – 7 days per week. Sports team ranged from 0 to 4.

Table 5

Correlation Variables

Variables	1	2	3	4	5	6	7
1. MVPA	1						
2. VPA	.695**	1					
3. Sports	.330**	.295**	1				
4. Sports outside of school	.313**	.320**	.434**	1			
5. Parent Support	.325**	.303**	.299**	.298**	1		
6. Friend Support	.346**	.326**	.341**	.286**	.498**	1	
7. Teacher Support	.246**	.190**	.370**	.190**	.341**	.459**	1

Note. ** $p < .001$

Regression Analyses

In order to determine the combined effects of the social support sources in predicting physical activity, hierarchical multiple regressions were employed to estimate how much variance in physical activity and sports participation could be accounted for by each social support source. For MVPA, four models were formulated (see Table 6). The first model included gender, ethnicity, and parental language use as control variables. In the second model, friend social support was used to predict MVPA. Results suggested that ethnicity did not play a significant role in predicting MVPA, however, gender and parental language use were significant predictors of MVPA. Specifically, in Model 1, the analyses showed that gender and ethnicity are significant predictors of MVPA accounting for 11% of the variance in MVPA, $R^2 = .11$, $F(2, 2374) = 140.24$, $p < .001$. In Model 2, the regression revealed that friend social support, in addition to gender and ethnicity, significantly accounted for 21% of the variance in MVPA, $R^2 = .21$, $F(3, 2373) = 213.70$, $p < .001$. When parental social support was added into the third model in addition to friend support, a change was revealed in accounted variance, $R^2 = .23$, $F(4, 2372) = 179.86$, $p < .001$. Finally, in Model 4, where teacher support was added in addition to the gender, parental language use, friend support, and parental support, the variance accounted for 24%, $R^2 = .24$, $F(5, 2371)$, $p < .001$. Together, 24% of the variance in students' MVPA was accounted for by all of the variables.

Table 6.

Predicting MVPA: Multiple Regression Results

Predictors	Coefficient Estimates			
	Moderate to Vigorous Physical Activity			
	Model 1	Model 2	Model 3	Model 4
Gender	-.26***	-.26***	-.25***	-.25***
Parental Language Use	-.19***	-.14***	-.14***	-.14***
Friend		.33***	.25**	.22**
Parent			.17**	.15***
Teacher				.09***
R ²	.11***	.21***	.23***	.24***

Note. *** $p < .001$, ** $p < .01$

For VPA, three models were formulated (see Table 7). The first model included gender, ethnicity, and parental language use as control variables. Ethnicity was not a significant predictor of VPA, however, results revealed that gender and parental language use accounted for 8% of VPA, $R^2 = .08$, $F(2, 2385) = 109.77$, $p < .001$. When friend social support was added in addition to gender and parental language use, the variance accounted for 18% in student's VPA, $R^2 = .18$, $F(3, 2384) = 174.15$, $p < .001$. Finally, in Model 3, where parental support was added in addition to the gender, parental language

use, and friend support, the variance accounted for 20%, $R^2 = .20$, $F(4, 2383) = 146.60$, $p < .001$. Teacher support was not a significant predictor of VPA. Together, 20% of the variance in students' VPA was accounted for by all of the variables.

Table 7.

Predicting VPA: Multiple Regression Results

Predictors	Coefficient Estimates			
	Vigorous Physical Activity			
	Model 1	Model 2	Model 3	Model 4
Gender	-.24***	-.24***	-.24***	-
Parental Language Use	-.16***	-.12***	-.10***	-
Friend		.31***	.24***	-
Parent			.16***	-
Teacher				-
R ²	.08***	.18***	.20***	

Note. *** $p < .001$, ** $p < .01$

For sports participation, four models were formulated (see Table 8). The first model included gender, ethnicity, and parental language use as control variables. Results

revealed that gender, ethnicity, and parental language use accounted for 3% of sports participation, $R^2=.03$, $F(3, 2375) = 26.28$, $p < .001$. In the second model, teacher support was added to gender, ethnicity, and parental language use and accounted for 16% of the variance in sports participation, $R^2=.16$, $F(4, 2374) = 109.60$, $p < .001$. When friend support was added in Model 3 in addition to teacher support, a change was revealed in accounted variance, $R^2=.19$, $F(5, 2373) = 111.65$, $p < .001$. Finally in Model 4, where parental support was added in addition to gender, ethnicity, parental language use, teacher support, and friend support the variance accounted for 20%, $R^2=.20$, $F(6, 2372) = 98.8$, $p < .001$. Together, 20% of the variance in sports participation was accounted for by all of the variables.

Table 8

Predicting Sports Participation: Multiple Regression Results

Predictors	Coefficient Estimates			
	Sports Participation			
	Model 1	Model 2	Model 3	Model 4
Gender	-.11***	.11***	-.11***	-.10***
Ethnicity	-.06***	.02***	-.04***	-.08***
Parental Language Use	-.14***	-.10***	-.09***	-.04***
Teacher		.35***	.26***	.24***
Friend			.21***	.16***
Parent		.	.	.12***
R ²	.03***	.16***	.19***	.20***

Note. *** $p < .001$, ** $p < .01$

For sports participation outside of school, three models were formulated (see Table 9). The first model included gender, ethnicity, and parental language use as control variables. Results revealed that ethnicity was not a significant predictor of sports outside of school, however, gender and parental language use accounted for 2% of the variance in sports participation outside of school, $R^2=.02$, $F(2, 2387) = 29.65$, $p < .001$. In the second model parental social support was used to predict sports outside of school. In model 2, the regression revealed that parental support, in addition to gender and parental language use, accounted for 11% of the variance in sports outside of school, $R^2=.11$, $F(3, 2385) = 95.28$, $p < .001$. When friend support was added in Model 3, 13% of the variance in

sports outside of school was accounted for, $R^2=.13$, $F(4, 2385) = 90.40$, $p < .001$. Teacher support was not a significant predictor of sports outside of school. Together, 13% of the variance in sports participation outside of school was accounted for by all of the variables.

Table 9. *Predicting Sports Participation Outside of School: Multiple Regression Results*

Predictors	Coefficient Estimates			
	Sports Participation Outside of School			
	Model 1	Model 2	Model 3	Model 4
Gender	-.13***	-.12***	-.12***	-
Parental Language Use	-.08***	-.03	-.02	-
Parent		.29***	.20***	-
Friend			.18***	-
Teacher				-
R ²	.03***	.16***	.19***	-

Note. *** $p < .001$, ** $p < .01$

In order to determine if social support for physical activity and sports participation varies by gender, ethnicity, and parental language use interaction variables were created. Then multiple regressions were employed using interaction variables to predict physical activity while controlling for other socio-demographic variables. See

Table 10 for MVPA and VPA regression results. See Table 11 for sports participation and sports participation outside of school regression results. If the regressions yielded significant results correlation analyses were conducted to determine the strength of the relationships by demographic variables.

Table 10. *Physical Activity Multiple Regression Results by Demographic Variables*

Variables	MVPA			VPA		
	R ²	B	t	R ²	B	T
Social Support X Gender	.07***			.05***		
Parent Social Support		-.03	-.24		-.02	-.63
Friend Social Support		.16	6.05***		.18	6.60***
Teacher Social Support		.06	2.50**		-.01	-.29
Social Support X Ethnicity	.17***			.14***		
Parent Social Support		.01	.28		.04	1.53
Friend Social Support		.21	7.50***		.20	7.22***
Teacher Social Support		.08	3.34**		.02	.79
Social support X Parental Language Use	.07***			.06***		
Parent Social Support		-.08	-2.68***		-.08	-2.67***
Friend Social Support		.06	1.76		.09	2.67***
Teacher Social Support		.01	.29		-.02	-.68

Table 11

Sports Participation Multiple Regression Results by Demographic Variables

Variables	Sports Participation		Sports outside of School	
Social Support X Gender	.11***		.04***	
Parent Social Support	-.02	.65***	.07	5.19***
Friend Social Support	.13	4.75***	.14	2.56**
Teacher Social Support	.22	9.17***	.00	.11
Social Support X Ethnicity	.12***		.08***	
Parent Social Support	-.06	-2.03*	.12	4.14***
Friend Social Support	.14	5.03***	.14	4.61***
Teacher Social Support	.23	9.46***	.02	.73
Social support X Parental Language Use	.03***		.02***	
Parent Social Support	-.13	-3.98***	.00	-.03
Friend Social Support	.01	.391	.04	1.21
Teacher social support	.15	5.21***	.01	.29

In terms of gender, interaction variables were created for gender and parent social support, gender and friend social support, and gender and teacher social support.

Multiple regressions revealed there were gender differences in friend and teacher support for MVPA; friend support for VPA; friend and teacher support for sports participation; and parent and friend support for sports participation outside of school. More specifically, correlation analyses revealed males ($r = .35$) reported lower friend support for MVPA ($r = .35$) than females ($r = .36$), and also lower teacher support for MVPA (males ($r = .12$), females, ($r = .29$)). Females ($r = .38$) also reported higher support from friends for VPA (males, $r = .37$). In contrast, males reported higher perceived support for sports participation and sports team participation outside of school. Males ($r = .35$) reported higher support from friends (females, $r = .34$) and teachers (males, ($r = .38$), females, ($r = .37$)) for sports team participation. For sports team participation outside of school hours, males ($r = .31$) reported higher levels of perceived parental support than females ($r = .29$). Correlations are represented in table 11.

In terms of ethnicity, interaction variables were created for ethnicity and parent support, ethnicity and friend support, and ethnicity and teacher support. Multiple regressions revealed ethnic differences in friend and teacher support for MVPA; friend support for VPA; friend, parent, and teacher support for sports team participations; and friend and parent support for sports team participation outside of school hours. More specifically, correlation analyses revealed Caucasians reported the highest level of perceived support for MVPA from friends (Caucasian ($r = .40$), Hispanic ($r = .32$), Other ($r = .29$), and African-American ($r = .27$)) and teachers (Caucasian ($r = .27$), Hispanic ($r = .27$), African-American ($r = .27$), and Other ($r = .27$)).

= .26), Other ($r = .21$) and African-American ($r = .12$). For VPA Caucasians ($r = .34$) reported the highest level of perceived support from friends, followed by African-Americans ($r = .32$), Hispanics ($r = .30$), and other ($r = .28$). For sports team participation Caucasians reported the highest level of perceived support from friends (Caucasians ($r = .40$), African American ($r = .36$), Hispanics ($r = .31$), and other ($r = .29$)), parents (Caucasian ($r = .33$), other ($r = .29$), Hispanic ($r = .27$), and African American ($r = .27$)), and from teachers (Caucasian ($r = .37$), African American ($r = .35$), Hispanic ($r = .35$), and other ($r = .32$)). Sports team participation outside of school yielded different results. African-Americans ($r = .34$) reported a higher level of perceived support from friends for sports participation outside of school than Caucasians ($r = .33$), other ($r = .25$), and Hispanic ($r = .23$). Correlations are represented in Table 12.

Table 12. *Significant Correlations*

		Correlation Coefficients											
		Friend Support				Parental Support				Teacher Support			
		MVPA	VPA	S	SOS	MVPA	VPA	S	SOS	MVPA	VPA	S	SOS
Gender													
	Male	.35**	.33**	.35**	.31**				.31**	.22**			.38**
	Female	.36**	.34**	.34**	.29**				.29**	.29**			.37**
49	Ethnicity												
		African-American	.27**	.32**	.34**	.341**			.27**	.25**	.13*		.35**
		Hispanic	.32**	.30**	.31**	.23**			.27**	.26**	.25**		.35**
		Caucasain	.40**	.34**	.40**	.33**			.33**	.37**	.27**		.38**
		Other	.29**	.28**	.29**	.25**			.29**	.23**	.21**		.32**
Parental Language													
Hispanic													
	Spanish		.27**			.27**	.22**	.21**					.28**
	English		.34**			.36**	.33**	.35**					.43**
	English		.33**			.28**	.31**	.31**					.38**
	Other		.24**			.32**	.27**	.09					.27**

In terms of parental language use, interaction variables were created for parental language use and parent support, parental language use and friend support, and parental language use and teacher support. Multiple regressions revealed language differences in parent support for MVPA; parent and friend support for VPA; and parent and friend support for sports outside of school. Correlation analyses revealed that Hispanics who speak English ($r = .36$) reported the highest perceived support from parents for MVPA followed by students who speak other languages ($r = .32$), students who speak English ($r = .28$), and Hispanics who speak Spanish ($r = .27$). For VPA, Hispanic students who speak English ($r = .33$) reported the highest level of perceived from parents, followed by all other English speaking students ($r = .28$), other ($r = .32$), and Hispanic students who speak Spanish ($r = .27$). Hispanic students who speak English ($r = .34$) also reported the highest level of perceived support for VPA from friends, followed by all other English speaking students ($r = .33$), Hispanic students who speak Spanish ($r = .27$), and other students ($r = .24$). Teacher support for VPA was also highest among English speaking Hispanic students ($r = .43$), followed by all other English speaking students ($r = .38$), Spanish speaking Hispanics ($r = .28$), and other ($r = .27$). For sports participation, English speaking Hispanic students ($r = .35$) reported the highest level of perceived support from parents followed by all other English speaking students ($r = .31$), Hispanic students who speak Spanish ($r = .21$), and other ($r = .09$). Correlations are represented in table 12.

Analyses of Variance

Pairwise t-tests and Analyses of Variance (ANOVA) were conducted to determine differences in physical activity participation and sports participation across gender, ethnicity, and parental language use. The means and standard deviations by demographic variables are in presented in Table 3.

Pair wise t-tests were used to determine whether physical activity and sports participation differed as a function of gender. There were significant gender differences in global physical activity and vigorous physical activity where males ($M = 4.75$) reported more days a week of global physical activity than females ($M = 3.56$), $t(2666) = 13.93$, $p < .001$, and also more days a week of vigorous physical activity, $t(2671) = 13.14$, $p < .001$ (males $M = 4.44$, females $M = 3.31$). In addition, there were significant gender differences in sports team participation, and sports team participation outside of school where males ($M = 1.12$) reported a higher number of sports teams than females ($M = .86$), $t(2608) = 5.915$, $p < .001$, and also a higher number of sports teams outside of school, $t(2616) = 6.48$, $p < .001$ (males $M = .91$, females $M = .66$).

In regards to ethnicity, ANOVAs were performed based on four categories: African American, Hispanic, Caucasian, and other. The other category included students of mixed origin, including Vietnamese, Chinese, Indian or Pakistani, Other Asian, American Indian or Alaska Native, native Hawaiian or other Pacific Islander. . Significant differences were found in terms of global physical activity, $F(3, 2635) = 27.10$, $p < .001$, and also vigorous physical activity, $F(3, 2640) = 20.89$, $p < .001$. The Tukey method for examining multiple group differences revealed that African Americans

($M = 4.72$) and Caucasians ($M = 4.51$) reported more days a week of global physical activity than other ($M = 4.22, p < .05$) and Hispanics ($M = 3.75, p < .05$). Similar, African-Americans ($M = 3.51$), Caucasians ($M = 4.23$), and other ($M = 4.00$) reported significantly higher levels of vigorous physical activity than Hispanics ($M = 3.51, p < .05$). In addition, significant differences were found in terms of sports team participation, $F(3, 2576) = 46.12, p < .001$, and sports team participation outside of school, $F(3, 2583) = 14.87, p < .001$. Post hoc tests revealed that African Americans ($M = 1.63$) reported higher levels of sports team participation than Caucasians ($M = .89, p < .05$), Hispanics ($M = .89, p < .05$), and Other ($M = .79, p < .05$). Similar, African Americans ($M = 1.07$) reported higher levels of sports team participation outside of school than Caucasians ($M = .85, p < .05$), Hispanics ($M = .69, p < .05$), and Other ($M = .67, p < .05$).

In terms of parental language use, ANOVA's were performed based on four categories: Hispanics that speak Spanish, Hispanics that speak English, all other students who speak English, and other. The other category included students whose primary language was Vietnamese or Chinese. Significant differences were found in terms of global physical activity, $F(3, 2672) = 37.96, p < .001$, and vigorous physical activity, $F(3, 2677) = 25.16, p < .001$. Post hoc tests revealed that students who speak English ($M = 4.58$) reported the highest levels of global physical activity, followed by Hispanic students who speak English ($M = 3.64, p < .05$), other ($M = 3.65, p < .05$), and Hispanic students who speak Spanish ($M = 3.51, p < .05$). Parallel to the global physical activity results, students who speak English ($M = 4.26$) reported significantly higher levels of vigorous physical activity than Hispanics who speak English ($M = 3.68, p < .05$), other

($M = 3.54$), and Hispanics who speak Spanish ($M = 3.40, p < .05$). Significant differences were found in terms of sports team participation $F(3, 2614) = 15.30, p < .001$, and sports team participation outside of school hours $F(3, 2622) = 9.62, p < .001$. Post hoc tests revealed that English speaking students ($M = 1.13$) reported higher levels of sports participation than Hispanic students who speak English ($M = 1.01$), Other ($M = .84, p < .05$), and Hispanic students who speak Spanish ($M = .78, p < .05$). Further, significant differences were found in terms of sports team participation outside of school hours. English speaking students ($M = .88$) reported the highest level of sports team participation outside of school hours followed by Other ($M = .84$), Hispanic students who speak English ($M = .73, p < .05$), and Hispanics that speak Spanish ($M = .64, p < .05$).

CHAPTER 5

The purpose of this study was to examine to what degree social support could predict physical activity and sports participation, and how social support sources vary across gender, ethnicity, and parental language use. A second purpose was to examine differences in physical activity levels and sports participation by the same demographic variables. The results of this study have important implications on how schools can increase physical activity and sports participation by targeting parents, teachers, and friends as social support sources.

The first hypothesis of the present study was confirmed - sources of social support predict physical activity in children, was confirmed. Multiple regressions revealed that social support was a significant predictor of moderate to vigorous physical activity, vigorous physical activity, sports team participation, and sports team participation outside of school hours. More specifically, friend support was the greatest predictor of MVPA and VPA. That is, youth who perceived higher levels of social support for physical activity from friends reported higher levels of physical activity. This finding is consistent with previous findings that suggest friend support for physical activity is most influential during adolescent years (Beets et al., 2006; Springer et al., 2006). This is not surprising considering the biological and social changes students go through during adolescence and the middle school years (Wigfield & Wagner, 2005). Friends may have a greater

influence than parents because students are trying to find and fit into a social group and adopting the behaviors of the social group, such as physical activity behaviors, help students feel like they belong. Schools should use this information to plan activities, or extracurricular events that friends can take part in together.

In contrast, multiple regressions revealed teacher support was the greatest predictor of sports team participation, and parental support was the greatest predictor of sports team participation outside of school hours. Often teachers are also coaches for school sports teams, therefore, it makes sense that teachers would have the most influence over sports team participation. Sports teams at school may also elicit a sense of school pride, therefore, students may relate more to the school community when it comes to sports participation (Weschler et al., 2000). Further, teachers often relate to students by discussing the sports teams the student belongs to at the school. This finding has promising implications for increasing sports team participation. Since students in this study were most influenced by the teachers for sports participation schools can inform teachers and other faculty on how to provide social support to students and the benefits of social support for sports team participation.

Parent social support was the greatest predictor of sports participation outside of school. This finding is not surprising considering sports outside of school may require transportation, cost, and availability of equipment, such as a YMCA or sporting equipment, which are all behaviors or resources that parents usually provide for their children (Duncan et al., 2005). Unfortunately, if parents are unable to provide these supportive behaviors their child may not take part in as many sports teams outside of

school hours. However, one way schools can encourage sports team participation outside of school hours is by sending home information for parents that outline sporting events or leagues outside of school that are cheap or free. This is important for schools to do, because not all students can make the school sporting teams, but still want to participate in sporting events. Therefore, if schools can help students find events outside of school they may be able to increase sports participation and physical activity.

Similar results were obtained for the second hypothesis – the combination of social support sources will predict higher levels of physical activity and sports participation, was confirmed. The combination of the three social support sources predicted higher levels of MVPA and sports team participation. Multiple regressions revealed that students reported higher levels of MVPA when they received social support from all three sources. Friends were the most significant predictor of MVPA followed by parents then teachers. For sports team participation, teacher support was the most significant predictor followed by friends than parents. That is, students receiving support from all three sources reported higher levels of MVPA and sports team participation. These results are consistent with previous research that suggests the importance of receiving support from multiple sources (Duncan et al., 2005) to increase physical activity. Obesity prevention programs should target friends, teachers, and parents in order to increase MVPA and sports participation.

Teacher support was not a significant predictor of VPA or sports participation outside of school. This makes sense because both questions referred to activity “outside of school hours.” Friend support was the most significant predictor of VPA followed by

parent support, and in contrast, parent support was the most significant predictor of sports participation outside of school hours followed by friend support. One way schools can encourage physical activity outside of school hours is to provide information for students and their parents on the options around the community. Targeting events where students can participate with their friends will increase the likelihood that the student will engage in the activity or event.

The third hypothesis - there will be differences in physical activity and sports participation by demographic variables was confirmed. Significant effects were found for the demographic variables with regards to social support, physical activity, and sports participation. As for gender, most differences were found in friend support. Girls reported significantly higher social support for MVPA and VPA from friends and higher support for MVPA from teachers. However, males reported significantly higher support from friends, parents, and teachers for sports participation. This finding matches previous research that suggest parents value sports participation more for male children (Troost et al., 2003). However, this finding is interesting because consistent with previous research (Grodon-Larsen et al., 1999; Sallis et al., 2000), males reported higher levels of MVPA, VPA, sports participation at school, and sports participation outside of school hours than females.

The results on gender differences and social support have been inconsistent (Davison, 2004; Beets et al., 2006). Since males reported higher levels of physical activity and sports participation one would assume they would also report higher levels of social support for all forms of physical activity, however, this was not the case. These

results suggest that males may receive more support for sports team participation, but not for physical activity. While the gender differences in social support for MVPA and VPA were much smaller, females still reported higher support for MVPA and VPA. One way schools might address the low sports team participation for females is by providing extra support from teachers and other members of the school community to show the importance of female sports.

There were more social support differences for physical activity and sports participation by ethnicity than any other demographic variable, with most of the differences found in friend support. There were differences in friend support for MVPA, VPA, sports participation, and sports participation outside of school. With regard to parent support, there were differences for sports participation and sports participation outside of school. As for teacher support, there were differences in MVPA and sports participation. For all the differences in social support, Caucasians' reported the highest perceived support, except for friend support for sports outside of school, in which case African Americans reported the highest perceived support. There was no pattern for which ethnicity usually reported the next highest perceived support. African-Americans reported the lowest support for friend support for MVPA, parent support for sports participation, and teacher support for MVPA. Hispanics reported the lowest perceived support from friends for sports outside of school. These results are consistent with Grieser et al. (2008) which suggest that black females reported less perceived support from teachers, and Hispanics reported less perceived support from male friends, and also from their families.

However, when examining physical activity differences by ethnicity results were not the same. For MVPA and VPA, African-Americans consistently reported the highest amount of activity, followed by Caucasians, other, and Hispanics. For sports participation, African-Americans also reported the highest amount of sports teams, followed by Caucasians, Hispanics, and other. These results are inconsistent with previous literature that suggests African-Americans report low levels of physical activity (Gordon-Larsen et al., 1999, 2000; Sallis et al., 2000). However, Hispanics did report the lowest levels of physical activity which is consistent with previous literature (Gordon-Larsen et al., Sallis et al.). African-Americans reporting higher physical activity levels could have promising implications that the gap in physical activity is closing. However, Hispanics still report significantly less physical activity and sports participation. Similar to gender differences, ethnicity differences in social support were not parallel to the ethnicity differences in physical activity and sports participation.

Differences in social support sources by parental language use were found mainly in parent support. Hispanic students who speak English reported the highest perceived support overall. More specifically, they reported the highest perceived support from parents for MVPA, VPA, and sports participation followed by all other students who speak English, and Hispanic students who speak Spanish. Hispanic students who speak English also reported the highest support from friends for VPA, and from teachers for sports participation, followed by all other students who speak English, and Hispanic students who speak Spanish. These findings are very interesting considering Hispanics reported some of the lowest perceived social support, however, when breaking Hispanics

down by parental language use Hispanics who speak English report the highest amount of perceived support.

The findings from parental language use and social support suggest that there may be a language or communication barrier. Springer et al. (2006) suggested three barriers to physical activity that may be represented by parent language use - communication, exclusion from social organization, and socio-economic disadvantage. Communication between school and parents could be a key component in social support differences by language use. For example, data from the 2003 National Household Education Surveys Program (NHES) shows that households of parents of English-speaking students report receiving more personal notes or emails about their child, school newsletters, memos, or notices than households of Spanish-speaking students. If non-English speaking parents are unable to communicate as effectively with the school they may be missing opportunities to enroll their children in extracurricular activities, or community activities. Without the knowledge of community activities, or extracurricular activities, parents miss the opportunity to encourage their children to participate.

Similar to gender and ethnicity results, physical activity by parental language use did not reflect the same pattern as social support by parental language use. English speaking students reported the highest levels of physical activity and sports participation, followed by Hispanics that speak English, and Hispanics that speak Spanish. This is consistent with previous research that suggests physical activity differences by parental language use and acculturation level (Springer et al 2006, Crespo et al., 2009). It is essential for schools, especially when the student population is majority Hispanic, to

provide resources for parents and students on the opportunities at school and around the community to be physically active.

Even though the physical activity levels do not reflect the social support sources by demographic variables it does not negate the relationship between social support and physical activity. Social support is still a significant predictor of physical activity and sports participation. This finding demonstrates how important it is to examine all physical activity and sports participation correlates, especially by demographic variables, when trying to increase physical activity.

Limitations of the Present Study

An important limitation to note is the cross-sectional study design which limits inferences on causality between social support and physical activity. Another limitation of the study was that the SES measure did not match the SES of the school, therefore, it could not be included in the analyses. Approximately, three percent of the sample reported being poor or nearly poor, however, this did not match the percentage of economically disadvantaged students by school district. For example, one of the school districts included in the sample had 64% economically disadvantaged, and another had over 90% economically disadvantaged. Finally, some of the significant differences using correlation coefficients had little practical significance. For example, there were significant gender differences in the relationship between physical activity and social support, however, the large sample size may have altered the correlation coefficients.

Recommendations for Parents and Teachers

Parents and teachers may be unaware of the social supportive behaviors that have been found to increase physical activity and sports participation. Parents have the ability to influence physical activity at school and outside of school, therefore, it is essential that they are informed on the social supportive behaviors that increase physical activity.

Teachers have the ability to increase sports participation, therefore, it is essential that they are also informed on how to provide social support for sports participation.

Parents should encourage their children to participate in as many activities during school and outside of school that are available. Encouragement has been found to be one of the most influential forms of parent social support (Beets et al., 2010). If children are able to see that their parents value physical activity and sports participation they are more likely to value it as well. Another way parents can show that they value physical activity is to participate in activities or sports with their children. Children whose fathers participated in sports with them on the weekend reported higher levels of physical activity (Beets et al., 2007). If parents cannot physically participate in activities with their children they can provide support by watching the activity or sporting event. Once the sport or activity has ended, parents should praise their child for being active. Praise can be a positive reinforcer for physical activity that parents can provide after sports participation, or any physical activity. Providing emotional and informational support for children is essential for increasing physical activity, however, instrumental support must be provided as well.

Instrumental support can be provided through transportation to sporting activities, providing resources, like equipment, and money for sporting events, and searching out opportunities for physical activity around the community (Beets et al., 2010). Since middle school children are unable to drive it is necessary that parents provide or find transportation to and from sporting events or activities. While it is not essential that parents buy their children sporting equipment, it does give children a greater opportunity to participate in physical activity at home. Overall, parents should try to provide as many opportunities, whether it be at school or around the community, for children to be physically active, and reinforce their physical activity behaviors through praise and encouragement.

Teachers are an influential source of social support for sports participation. Teachers can provide social support for sports by going to school sporting events and praising participation in sports. Since sports provide a sense of school belonging (Weschler et al., 2000), teachers can use this to their advantage. Teachers could use a portion of their wall space to dedicate to student athletes, whether it is student athletes in school competitive sports, intramural sports, or sports around the community. This would show students that teachers value sports, which is important for students. Teachers can also use school sports as a way to connect with students. Adolescence is often a hard time to make connections with students, however this is a way to show students that teachers and students share some of the same interests. Overall, teachers should encourage and praise student participation in sports, and provide support by going to school sporting events.

Conclusion

This study has important implications for how schools and obesity prevention programs can try to increase physical activity and sports participation through social support. Since friends seem to be the most influential source of support for physical activity during adolescence, prevention programs should promote physical activity events that friends can participate in together. In order to address differences in social support at school and outside of school, prevention programs should overcompensate and send materials and resources to students and parents that outline physical activity and sporting events at school and around the community. In addition, schools should provide resources in multiple languages so parents who do not speak English still have opportunities to encourage their child to participate in activities. The disparities in physical activity levels are still present, however, by identifying correlates of physical activity, such as social support, schools are able to target the correlates and provide resources to close the physical activity gap.

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CURRICULUM VITAE

Sarah Conklin graduated from James Madison University in 2009 with a BA in Psychology. While at George Mason University Sarah Conklin worked with professors Dr. Sheri Berkeley, and Dr. Kelley Regan as a graduate research assistant in the Special Education Department. Sarah Conklin will be enrolling at Virginia Commonwealth University in the fall of 2011 where she will be studying for a PhD in Education with a specialization in Educational Psychology.