

ASSOCIATIONS AMONG PEER VICTIMIZATION, SOCIAL ANXIETY AND
CHILDREN'S SELF-REPORTED PHYSICAL ACTIVITY

BY

C2009

Marilyn Laila Sampilo

Submitted to the graduate degree program in Clinical Child Psychology
and the Graduate Faculty of the University of Kansas
in partial fulfillment of the requirements for the degree of
Master's of Arts.

(Chair)

Ric G. Steele, Ph.D.

Committee Members

Bridget K. Biggs, Ph.D.

Ann M. Davis, Ph.D.

Date defended: October 23, 2009

The Thesis Committee for Marilyn L. Sampilo certifies
that this is the approved Version of the following thesis:

ASSOCIATIONS AMONG PEER VICTIMIZATION, SOCIAL ANXIETY, AND
CHILDREN'S SELF-REPORTED PHYSICAL ACTIVITY

Committee:

Ric G. Steele, Ph.D. (Chair)

Bridget K. Biggs, Ph.D.

Ann M. Davis, Ph.D.

Date approved: October 23, 2009

Table of Contents

List of Tables.....	iv
Acknowledgements.....	v
Abstract.....	vi
Introduction.....	1
Method.....	11
Results.....	16
Discussion.....	21
References.....	28
Appendix A: The Social Experience Questionnaire, Self-Report.....	36
Appendix B: Perceptions of Teasing Scale.....	38
Appendix C: The Social Anxiety Scale for Children Scale- Revised.....	40
Appendix D: Self-Administered Physical Activity Checklist.....	43

List of Tables

Tables

Table 1	Sample Characteristics	12
Table 2	Means Table for Measures	17
Table 3	Bivariate Correlations between Peer Victimization, Weight-Related Criticism,, Social Anxiety, and Physical Activity	17
Table 4	Summary of Mediation Analyses for Peer Victimization (IV), Social Anxiety (Mediator), and Physical Activity (DV)	20
Table 5	Summary of Mediation Analyses for Weight-Related Criticism (IV), Social Anxiety (Mediator), and Physical Activity (DV)	21

Acknowledgments

I would like to acknowledge those who have been instrumental in the completion of this project. First, my master's thesis co-chairpersons, Ric Steele and Bridget Biggs, have provided me with invaluable guidance and direction throughout all phases of this project- from conceptualization to the final written product. I have undoubtedly benefited from their cooperative mentorship. Second, current and former members of my thesis committee, Ann Davis and Michael Roberts, provided ongoing support and constructive feedback. Third, my colleague and partner in this undertaking, Jason Van Allen, helped to facilitate this study from its inception. Fourth, an undergraduate research assistant, Erin Anderson, was indispensable in assisting me with data collection. Fifth, my cohort mate and colleague, Megan McFadden, provided me with encouragement throughout this process. Finally, the employees, volunteers, and members of the Boys and Girls Club, worked closely with the investigators to make this a successful project.

ABSTRACT

Marilyn L. Sampilo

Clinical Child Psychology Program

Departments of Applied Behavioral Science and Psychology, October 2009

University of Kansas

Psychosocial difficulties, including peer victimization and anxiety, have been found to influence physical activity engagement among school-aged children. Understanding the mechanisms through which these factors may exert their influence is important to the design and implementation of health promotion programs and prevention programs for pediatric obesity. In this study, a community sample of 74 4th – 6th grade students completed measures of peer victimization, weight-related criticism, social anxiety, and physical activity. Indirect effects were found such that peer victimization and weight-related criticism were associated with social anxiety which, in turn, was associated with decreased participation in high intensity physical activity. Social anxiety as a mediator in these relationships was not supported. These findings underscore the importance of identifying potential barriers to participation in physical activity and highlight potential pathways through which these barriers operate.

Associations Among Peer Victimization, Social Anxiety, and Children's Self-Reported Physical Activity

Pediatric overweight and obesity is associated with a variety of physical and psychological consequences that are detrimental to the health and well-being of these youth (Daniels, 2006). Recent results from the National Health and Nutrition Examination Survey indicate that 16.3% of children and adolescents in the United States are obese and 31.9% of youth are overweight (Ogden, Carroll, & Flegal, 2008). Because of the prevalence of obesity and overweight among youth, intervention efforts have attempted to curb rates of pediatric overweight and obesity and the potential negative outcomes that may result. Interventions typically include an exercise or physical activity component in treatment (Jelalian & Saelens, 1999) to promote both short- and long-term weight loss. These interventions, however, are not always effective in increasing energy expenditure or level of physical activity in children (Berry et al., 2004). One potential barrier that has been identified in the literature is peer victimization (PV; Hayden-Wade et al., 2005; Storch et al., 2007). Youth who experience peer victimization are less likely to engage in physical activity and avoid situations that offer such opportunities.

Thus, it is important to develop a better understanding of this potential barrier to physical activity in order to better inform intervention efforts and to adequately address this particular issue in considering responsiveness to intervention. Peer victimization may directly impact engagement in physical activity or may operate through alternative pathways to influence engagement in physical activity. The present study will examine one potential pathway, social anxiety, as a mediator of the relationship between peer victimization and physical activity.

Physical Activity in the Treatment of Pediatric Overweight and Obesity

It is clear that without appropriate and effective intervention efforts targeting the increasing rates of overweight and obesity in children, potential adverse biological, physical and psychosocial consequences emerge at younger ages and may persist into adolescence and adulthood (Malecka-Tendera & Mazur, 2006). There have been a variety of approaches to childhood obesity intervention programs and such interventions have demonstrated a mixture of results (Berry et al., 2004; Stice, Shaw, & Marti, 2006).

Physical activity or exercise has long been established as a necessary, active component in intervention efforts for pediatric obesity (Epstein, Paluch, Roemmich, & Beecher, 2007). In a comparison of different treatment approaches for obesity among parents and children, Epstein, Wing, Koeske, and Valoski (1984) found that parents and children assigned to diet only and diet plus exercise conditions showed greater weight change than a no-treatment control group. Similar results were found in a review of 42 pediatric obesity intervention programs by Jelalian and Saelens (1999). They noted that behavioral modification components were crucial in producing positive health gains. Specifically, modification of health behavior in the areas of nutrition and physical activity were superior to education alone in producing short-term weight loss. Furthermore, Jelalian and Saelens noted that a combination of diet and energy expenditure treatment components were most effective in producing long-term health gains in overweight and obese children.

Although it seems clear that physical activity is necessary for weight loss and the promotion of weight management, it is less clear how much exercise is necessary to produce positive health gains. Atlantis, Barnes, and Fiatarone Singh (2006) conducted a

systematic review of exercise interventions for overweight and obese children and adolescents. Their findings indicated that physical activity, even at lower levels than the recommended daily doses of activity, was significantly related to reductions in overall percent body fat in overweight and obese youth.

In a meta-analysis of obesity prevention programs, Stice et al. (2006) examined the role of hypothesized moderators on program effects. These authors found that physical activity was one of several hypothesized moderators that did not influence program effects, suggesting the introduction of a physical activity component or attempts to increase activity were not always effective in producing greater program effects.

Relatedly, some authors have found that interventions involving increased physical activity do not produce effects above and beyond regular, school-based physical education classes or physical activity as usual (McMurray et al., 2002; Neumark-Sztainer, Story, Hannan, & Rex, 2003). It is important to note that, across these studies, it is unclear how adherent participants were to physical activity recommendations—and in how much physical activity they actually engaged, even when increased physical activity was a specific aim of an intervention.

Although the research indicates that increased physical activity is a key treatment component for weight reduction or maintenance in obese and overweight youth, studies suggest that some children are not benefiting from targeted interventions or demonstrating the health benefits associated with such activities. Several interventions have failed to obtain desirable results (e.g. significant changes in BMI, diet and reported physical activity; Hopper et al., 1996; Luepker, Perry, & McKinlay, 1996). It may be that these

children fail to achieve benefit because interventions do not address barriers to even mild to moderate physical activity adequately. Specifically, teasing and other forms weight related criticism and peer victimization have been linked to decreased engagement in physical activity (Faith, Leone, Ayers, Heo, & Pietrobelli, 2002; Hayden-Wade et al., 2005; Storch et al., 2007).

Peer Victimization and Physical Activity

Obesity and overweight in children and adolescents is associated with poorer psychosocial functioning (Puhl & Latner, 2007; Warschburger, 2005). Teasing and other forms of peer victimization have been found in various studies of psychosocial adjustment in children with weight management problems.

In a study of overweight and non-overweight 10-14 year olds, Hayden-Wade et al. (2005) found that overweight children were subjected to more appearance related teasing and stigmatization than normal weight children and that these teasing experiences had an influence on preferences for types of activity (physical vs. sedentary). Bauer, Yang and Austin (2004) found that weight related teasing was one main concern voiced by students and teachers when identifying barriers to promoting nutrition and physical activity in schools. Similarly, Haines, Neumark-Sztainer, and Thiel (2007) found that weight-related teasing was a prominent issue affecting elementary school aged children.

Few studies have examined how the relationship between peer victimization and physical activity affects physical activity engagement. The potential mechanisms through which emotional difficulties resulting from peer victimization may hinder participation in physical activity are not clear. Storch and colleagues (2007) offered some insight

regarding this issue when they examined the relationship between peer victimization, depression, and physical activity in overweight and obese youth. The researchers found that peer victimization was positively associated with depressive symptoms and negatively associated with physical activity. Additionally, the authors determined that depressive symptoms served as a partial mediator of this relationship. These findings suggest that peer victimization could lead to symptoms of depression such as sadness, fatigue, and anhedonia that can translate into decreased physical activity engagement or an avoidance of participation in physical activity altogether.

Similarly, it is conceivable that symptoms of anxiety resulting from peer victimization could lead to avoidance of physical activity. Emotional symptoms of anxiety, such as excessive fear and anticipating the worst, and physical symptoms, such as rapid heart rate and stomach upset, have been thought to contribute to decreased physical activity or avoidance of physical activities. Storch and colleagues (2007) addressed this question by examining anxiety and social physique anxiety (anxiety experienced over fear of others' perception and evaluation of one's body) as potential mediators of the peer victimization-physical activity association. Although they found anxiety and social physique anxiety to be highly correlated with peer victimization, neither type of anxiety was related to physical activity. This finding is particularly interesting given other research which has suggested that anxiety is associated with decreased engagement in sports and physical activity (Lemmon, Ludwig, Howe, Ferguson-Smith & Barbeau, 2007; Storch, Barlas, Dent & Masia, 2002).

Due to the contrasting nature of these results, further investigation is needed to clarify the association between peer victimization and physical activity. While Storch and colleagues (2007) examined general anxiety and a very specific type of anxiety (i.e. social physique anxiety), they did not examine social anxiety specifically. Social anxiety is an excessive fear or worry over embarrassment in a social situation (Albano, Chorpita, & Barlow, 2003). La Greca and Stone (1993) established a tripartate model of social anxiety consisting of fear or avoidance of unfamiliar social situations, generalized fear or avoidance of social situations, and fear of negative evaluation in social situations. Social anxiety can be extremely debilitating in that individuals afflicted with the disorder or symptoms of the disorder often avoid social situations, new social experiences, and situations in which they may be judged by others, which may, in turn, affect an individual's engagement in physical activities. Social anxiety may be a particularly important barrier to treatment of childhood obesity given the social context of many physical activity opportunities, especially at school and in extra curricular activities.

Peer Victimization and Social Anxiety

A growing body of research indicates that children who are victimized by their peers experience elevated levels of social anxiety. Slee (1994) found that peer victimization among children in grades 3-7 was associated with fear of negative evaluation and, for girls, social avoidance and distress. Storch, Brassard, and Masia-Warner (2003) found that both overtly and relationally victimized youth were likely to report symptoms of social anxiety, including fear of negative evaluation, physiological symptoms of anxiety, and social avoidance, as well as loneliness. Storch and Masia-Warner (2004) found similar

results in a study of overt and relationally victimized girls. In addition to experiencing symptoms of social anxiety and loneliness, victimization was also associated with general avoidance of new situations and social situations.

These findings are particularly important given the implications they have for children's participation in physical activity. Because children with weight management issues are likely to experience peer victimization and peer victimization is related to social anxiety, these children may also exhibit fear of negative evaluation and avoidance of social situations, which can negatively impact the extent to which children voluntarily engage in physical activity. Given that opportunities for physical activity engagement, particularly at school, are also opportunities for socialization, children with symptoms of social anxiety may be less inclined to participate actively and more likely to withdraw from such activities. For example, self-consciousness, fear of embarrassment, or fear of negative evaluation in the presence of peers are hypothesized to negatively influence physical activity participation.

Social Anxiety and Physical Activity

In a previously mentioned study conducted by Hayden-Wade and colleagues (2005), peer victimization was found to be associated with a tendency to prefer to engage in solitary activities over social activities. Importantly, solitary activities were generally more sedentary in nature. This finding suggests that peer victimization may lead victimized youth to eschew peer-related social activities (Beidel & Turner, 1998) in favor of more solitary, and sedentary, activities. This finding is important in that peer related social activities such as sports and other extra-curricular activities offer opportunities for

overweight and obese youth to become active compared to solitary sedentary activities. The extent of these youths' participation in physical education and recess may also be influenced by negative interactions with peers and cause some youth to develop social anxiety and fear of negative evaluation, one primary aspect of social anxiety.

Ridgers, Fazey, and Fairclough (2007) examined the impact of fear of negative evaluation on perceived competence in a physical education setting. In a sample of 192 elementary school aged children, Ridgers and colleagues found that fear of negative evaluation was associated with low perceptions of competence in girls. Vernberg, Abwender, Ewell, and Beery (1992) suggested that experiences which confirm one's low perception of competence may result in an increased fear of negative evaluation and can lead to avoidant behaviors. Therefore, in the context of overweight and obese youth, peer victimization may serve to reinforce negative self-appraisals during physical activity resulting in an increased fear of negative evaluation and withdrawal or greater avoidance of these situations.

Teachman and Allen (2007) examined a path for the development of social anxiety and fear of negative evaluation in 185 adolescents. They found that certain qualities or characteristics of peer interactions could predict the emergence of symptoms associated with social anxiety. Specifically, they found that low perceived peer acceptance predicted later development of social anxiety symptomology and fear of negative evaluation or feedback. This finding is important in light of some youth's avoidance of physical activity. For overweight and obese youth, perceived lower peer acceptance may be the norm considering overweight status has been previously associated with lower self-esteem or

lower perceived competence (Franklin, Denyer, Steinbeck, Caterson, & Hill, 2006; Strauss, 2000). Thus, these youth may anticipate a lack of peer acceptance which may then result in social anxiety and fear of negative feedback or negative appraisal.

While clinical levels of social anxiety may be prevalent in overweight and obese youth, subclinical levels of anxiety are common and can also interfere in young people's engaging in physical activity. For example, Henker, Whalen, Jamner, and Delfino (2002) found that a low-level anxious referent group demonstrated an overall increase in anxiety when in the presence of a coach or team. Thus, even individuals who are thought to demonstrate little to no anxiety symptoms may be affected in a sport or exercise setting.

It is imperative to examine how social anxiety in and of itself may contribute to the avoidance of physical activity among overweight and obese youth. Knowing the extent to which social anxiety plays a role in children's willingness to engage in social and energy expending activities will guide the development of interventions designed to promote increased physical activity. Also, because social anxiety is associated with peer victimization and with avoidance of physical activities of a social or evaluative nature, it is also important to examine social anxiety as a potential mediator of the connection between peer victimization and physical activity (See Figure 1).

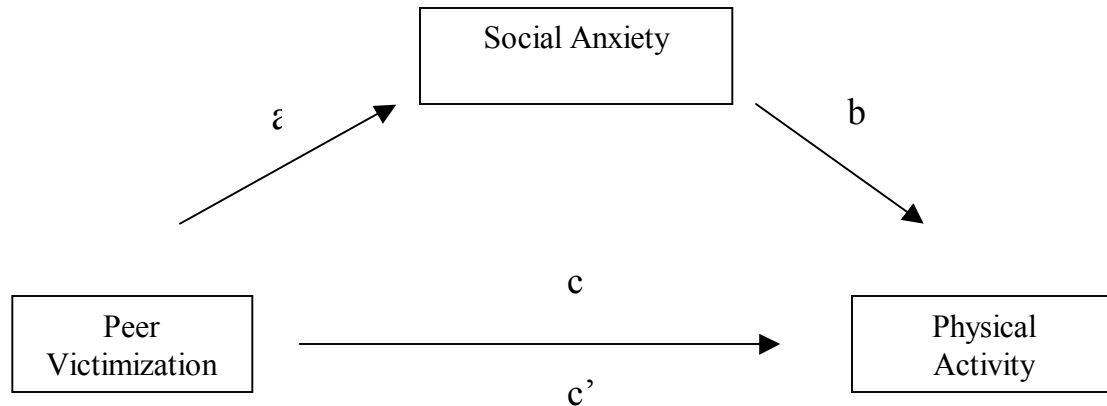


Figure 1.

The Current Study

The present study aims to describe the relationships among peer victimization, social anxiety, and self-reported physical activity in a sample of both overweight and non-overweight youth. The present study contributes to the current literature by examining a unique pathway that may help explain how peer victimization negatively influences engagement in physical activity. Although peer victimization has been linked to both social anxiety and physical activity independently, these variables have not been examined previously in the context of a mediation model. Empirical support for the hypothesized mediation model would indicate that interventionists should assess and address both peer victimization and social anxiety in the design and delivery of obesity prevention and intervention programs.

We employed a cross-sectional, correlational design to examine the associations among peer victimization (general and weight related criticism), social anxiety, and

physical activity. We hypothesized that both forms of peer victimization (PV) and social anxiety would be negatively associated with physical activity, and that both forms of peer victimization would be positively related to social anxiety. Further, we hypothesized that social anxiety would explain, or mediate, the relationship between peer victimization and physical activity. We examined both direct and indirect effects among the variables as evidence to support this mediation model. It is possible, however, that an indirect effect of social anxiety on the relationship between peer victimization and physical activity may be significant in the absence of a significant direct effect; therefore, we examined both potential mediation and indirect effects.

Method

Participants

A total of 210 consent forms were distributed across 7 Boys and Girls Clubs sites. Eighty four consent forms were returned (75 indicated consent, 9 indicated non-consent). Seventy five children, ages 9-12, were recruited for participation in this study. Eligibility criteria for participation included 1) the child be 9-12 years old, 2) the child spoke and read English proficiently, and 3) the child's parent or legal guardian provided informed consent for participation. All students meeting these criteria were deemed eligible regardless of weight status, sex, or ethnicity. One child from the sample did not provide assent and was not included in any study activities.

The resulting sample consisted of 74 children. Table 1 summarizes participants' demographic data (36 males, 38 females; M age = 10.84, SD = .98). The sample's weight status composition was 50% Healthy Weight; 35.1% Overweight; 14.9% Obese. The

sample’s racial and ethnic composition was 51.4% Caucasian; 21.6% African-American; 9.5% Native American; 9.5% Other; 5.4% Hispanic; and 2.7% Asian-American/Pacific Islander; making it more diverse than the school district in which the Boys and Girls Club operates.

Table 1

<i>Sample Characteristics</i>		
<i>Characteristic</i>	<i>n</i>	<i>%</i>
Gender		
Male	36	48.6
Female	38	51.4
Race or Ethnicity		
White or European American	38	51.4
Black or African American	16	24.6
Hispanic American and/or Latino/a	4	5.4
Asian American or Pacific Islander	2	2.7
Native American or American Indian	7	9.5
Other	7	9.5
Weight Status		
Underweight	0	0
Healthy Weight	37	50.0
Overweight	26	35.9
Obese	11	14.1

Measures

Body Mass Index. Participants’ height and weight were collected using a portable stadiometer and a portable electronic scale. Data on physical measures (height and weight) were collected individually and measured by the investigator(s) and trained undergraduate research assistants. Consistent with CDC recommendations (2009), weight was calculated as the average across three measurements. Participants were weighed without shoes. Using participants’ height, weight, age, and gender, an online calculation tool available from the CDC was used to calculate BMI , BMI percentile, and BMIz for each participant, (Centers for Disease Control and Prevention, 2009). BMI percentiles were based on the growth chart data and parameters from the National Health and Nutrition

Examination Survey (2000).

General Peer Victimization. The Social Experience Questionnaire- Self Report (SEQ-S; Crick & Grotpeter, 1996, Appendix A) is a self-report measure designed to assess children's experiences with peer victimization. The measure consists of 15 items that evaluate the frequency with which the child has been targeted for physical harm (overt victimization, 5 items), has been targeted for harm via peer relationships (relational victimization, 5 items), and has been a recipient of peers' prosocial acts (5 items). Children responded to items on a 5-point Likert scale from 1 (never) to 5 (all the time). The sum of participants' responses across the ten victimization items served as an indicator of general peer victimization (PV). This measure was designed for utilization with children in 3rd through 6th grade. Previous research has found internal consistency for this measure to be between .77-.80 (Storch, Crisp, Roberti, Bagner, & Masia-Warner, 2005). Internal consistency (alpha coefficient) in the present sample was .76.

Weight Related Criticism. The Perceptions of Teasing Scale (POTS; Thompson, Cattarin, Fowler, & Fisher, 1995, Appendix B) assesses weight-related teasing. This measure consists of 11 items describing common ways children may be teased, most of which focus on body or weight issues. Children indicate how often they have ever experienced these types of teasing on a five point scale from 1 (never) to 5 (very often). If the child endorses one of the teasing items, they are asked to rate to what degree it bothered them. This rating is also on a five point scale from 1 (not upset) to 5 (very upset). Weight-related criticism (WR-C) was measured as the total score of the frequency items on the POTS (6 items). Previous research has demonstrated that this measure has

good internal consistency ($\alpha = .95$) (Hayden-Wade et al., 1995) and has been validated against other psychological measures related to teasing. Internal consistency (alpha coefficient) in the present sample was .72.

Social Anxiety. The Social Anxiety Scale for Children-Revised (SASC-R; La Greca & Stone, 1993, Appendix C) is a self-report measure designed to assess children's levels of social anxiety. The SASC-R is designed for utilization with children ages 7-13 years. This measure consists of 22 items (including 4 filler items) that evaluate three aspects of social anxiety (SA): Fear of Negative Evaluation from peers (FNE = 8 items), Social Avoidance and Distress around New Peers or in New Situations (SAD-New = 6 items), and Generalized Social Avoidance and Distress (SAD-General = 4 items). Items are rated on a 5-point Likert scale from 1 (not at all) to 5 (all the time) and summed across items to obtain a total score and a score for each of the three subscales. Previous research has supported adequate reliability and validity of this instrument (Ginsburg, La Greca, & Silverman, 1998; Storch, Eisenberg, Roberti, & Barlas, 2003). Internal consistency (alpha coefficient) in present sample was .84.

Physical and Sedentary Activity. Physical and sedentary activity was measured using the Self-Administered Physical Activity Checklist (SAPAC; Sallis et al., 1996, Appendix D). The SAPAC is a self-report measure of one's physical activity. For this measure, children report minutes they have engaged in 21 listed activities. Children are also able to list other activities not included or endorsed on the original list.

This measure was developed as a one-day recall of minutes engaged in activity before, during, and after school, as well as subjective levels of intensity. Self-reported

physical activity was measured as the total minutes engaged in vigorous and moderate physical activity (PA-V and PA-M). Previous research comparing self-reports and interviews yielded correlations of $r = .64$ to $r = .79$ (Sallis et al., 1996).

Procedure

Consent forms were given to the Boys and Girls Club program managers and distributed to children ages 9-12 years enrolled in after school programs at local Boys and Girls Club sites. Children were instructed to take these forms home to their parents for review. The distributed consent forms provided a description of the study, details regarding data collection procedures, details regarding procedures used to ensure confidentiality for study participants, and any risks associated with participation. Only children who returned forms signed by their parent or legal guardian indicating consent were eligible to participate. Forms were then collected by the program managers and given to the investigator(s). In order to encourage children to return consent forms (indicating consent or non-consent), a prize (a visit from a local university mascot) was arranged for each Boys and Girls Club site with a return rate for consent forms at or above 80%.

Children whose parents gave consent were gathered together in a room at the Boys and Girls site. Children were distributed assent forms and packets with identification numbers. Children were informed that they could choose to not answer questions that make them uncomfortable and could discontinue participation at any time. The assent form also indicated that withdrawal or non-assent would not adversely affect their participation in Boys and Girls Club activities. Children were asked to indicate their assent or non-assent by circling “yes” or “no” on the form. Children who did not provide assent

were excused to resume Boys and Girls Club activities. Packets with identification numbers were distributed to children who provided assent. The packets included a brief questionnaire of demographic information and the above described measures regarding psychological, social, and physical functioning. The investigator(s) and research assistants read measures aloud to the participants to ensure comprehension of each item and monitored completion to offer assistance as needed.

On a subsequent visit to the Boys and Girls Club sites, data on height and weight were collected. Children participating in the study were asked to accompany investigators to a classroom where information on height and weight was obtained using a stadiometer and electronic scale. The information collected was recorded on a form to facilitate calculation of BMI percentile. These forms were matched to children's data using a master list of names and identification numbers which were destroyed upon completion of the study and analyses.

Results

Power Analysis. An a priori power analysis was conducted to determine the number of participants required to detect the hypothesized effects. The power analysis was conducted using a computer software program, G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007). With given effect sizes, estimated from the existing literature on the associations among peer victimization, social anxiety, and physical activity (Hawker & Boulton, 2000; Storch et al. 2007) and power set to .85, the total sample size needed was 74.

Preliminary Analyses. First, the associations among the primary variables (i.e.

general peer victimization, weight-related criticism, social anxiety, physical activity). demographic variables (i.e. gender, age, ethnicity), and BMI, were examined to determine whether any of the demographic variables needed to be included as covariates in the primary analyses. These associations were tested with independent t-tests and/or correlations. In addition, the means, standard deviations, and bivariate correlations among the primary study variables were also examined (See Tables 2 and 3).

Table 2
Means Table for Measures

Measure	<i>M</i>	<i>SD</i>	<i>Range</i>
SEQ-S	19.55	7.12	27.00
POTS	8.19	4.23	18.00
SASC-R	41.73	12.89	65.00
SAPAC (PA-V)	113.64	108.48	360.00
SAPAC (PA-M)	137.09	109.98	400.00

Table 3
Bivariate Correlations between Peer Victimization, Weight-Related Criticism, Social Anxiety, and Physical Activity

	Peer Victimization	Weight- Related Criticism	Social Anxiety	BMIz Score	Physical Activity	
					Vigorous	Moderate
Peer Victimization						
Weight-Related Criticism	.44**					
Social Anxiety	.51**	.43**				
BMIz Score	.00	.21	.00			
Physical Activity- Vigorous	.12	.16	-.29*	.13		
Physical Activity- Moderate	.05	-.07	-.21	-.03	.53**	

* $p < .05$; ** $p < .01$

General peer victimization was significantly and positively correlated with social anxiety ($r = .511$), such that higher rates of self-reported peer victimization were

associated with higher scores on social anxiety. Weight-related criticism was moderately correlated with social anxiety ($r = .429$) such that higher rates of weight-related teasing were associated with elevated levels of social anxiety. Social anxiety was significantly correlated with physical activity in the expected direction, such that higher social anxiety was negatively correlated with vigorous physical activity ($r = -.294$). Neither peer victimization nor weight-related criticism were associated with time engaged in either vigorous or moderate physical activity.

Primary Analyses. Determining the associations among peer victimization, social anxiety and self-reported physical activity was the primary purpose of the present investigation. Although there are a variety of methods to test for mediation, the procedures outlined by Preacher and Hayes (2004) were used to test the primary main hypotheses: (1) that social anxiety mediates the relationship between general peer victimization and physical activity, and (2) that social anxiety mediates the relationship between weight related criticism and physical activity. The Preacher and Hayes method of assessing mediation is similar to the Baron and Kenny (1986) approach with a few important exceptions. Similar to the Baron and Kenny approach, the Preacher and Hayes method assesses mediation by examining the associations among the variables. The total effect of the predictor (victimization and weight criticism) on the criterion (physical activity) and the effect of the predictor on the criterion after inclusion of the proposed mediator (social anxiety) into the model are examined.

The important advances of the Preacher and Hayes (2004) approach include the emphasis on testing the indirect effect, the product of path coefficients associated with the

relation between the predictor (victimization) and mediator (social anxiety) and between the mediator and criterion (physical activity) in the tested mediation model. Examination of indirect effects is independent of mediation. Additionally, Preacher and Hayes outline procedures that test all effects simultaneously and maximize power to detect these effects with a bootstrapping technique.

Maximizing power is important given that, in a comparison of methods used to test for mediation, MacKinnon et al. (2002) found many studies to be underpowered when utilizing traditional methods. Shrout and Bolger (2002) recommended bootstrapping to assess the significance of the indirect effect because the sampling distribution of the indirect effect is generally not normal and confidence intervals can be obtained that do not rely on assumptions of normality, an important consideration when working with smaller sample sizes.

Tables 4 and 5 summarize the results of the models for peer victimization and weight-related criticism as the predictor variables for vigorous physical activity (Model 1) and for moderate physical activity (Model 2). Due to the lack of correlation between BMIz and gender with any predictor variables, these variables were not included as covariates in the analyses. Based on the lack of association among some variables of interest (PV and PA), mediation was not pursued further. Analyses of indirect effects, however, were conducted.

For peer victimization Model 1, results indicated a non-significant total effect and significant effects for paths *a* (PV and SA), *b* (SA and PA-V), and *c'* (direct effect of PV on PA-V controlling for SA). A significant indirect effect was found such that peer

victimization was related to social anxiety, which in turn, was related to engagement in vigorous physical activity (PV → SA → PA-V). The emerging significance of the direct effect between peer victimization and vigorous physical activity after controlling for social anxiety suggests a potential suppressor effect. Similar results were obtained for peer victimization Model 2, such that paths *a* (PV and SA) and *b* (SA and PV-M) were significant. Paths for *c* and *c'* were nonsignificant. A significant indirect effect was found such that peer victimization was related to social anxiety, which in turn, was related to engagement in moderate levels of physical activity.

Table 4

Summary of Mediation Analyses for Peer Victimization (IV), Social Anxiety (Mediator), and Physical Activity (DV)

Path	β	<i>B</i>	<i>SE</i>	<i>p</i>	CIs for Indirect Effect		<i>R</i> ²
					Lower	Upper	
Model 1: Predicting Engagement in Vigorous Physical Activity							
PV-SA (<i>a</i> path)	.92		.18	<.001			.17
SA-PA (<i>b</i> path)	-7.28	-.48	1.86	<.001			
Total Effect PV-PA (<i>c</i> path)	3.37	.12	3.17	.29			
Direct Effect PV-PA (<i>c'</i> path)	10.10	.37	3.37	.00			
Indirect Effect (<i>ab</i> path)					-11.76	-1.72*	
Model 2: Predicting Engagement in Moderate Physical Activity							
PV-SA (<i>a</i> path)	.92		.18	<.001			.08
SA-PA (<i>b</i> path)	-4.47	-.32	1.86	.02			
Total Effect PV-PA (<i>c</i> path)	1.27	-.05	2.98	.67			
Direct Effect PV-PA (<i>c'</i> path)	5.40	.21	3.36	.11			
Indirect Effect (<i>ab</i> path)					-9.21	-.12*	

Note. **p* < .05

Confidence intervals not including zero indicate a statistically significant indirect effect at *p* < .05.

For weight-related criticism Model 1, a non-significant total effect and significant effects for paths *a* (WR-C and SA), *b* (SA and PA-V), and *c'* (direct effect of WR-C on PA-V controlling for SA) were found. A significant indirect effect was found such that

weight-related criticism was related to social anxiety, which in turn, was related to engagement in vigorous physical activity (WR-C → SA → PA-V). The emerging significant effect of path *c*' again suggests a potential suppressor effect. For weight-related criticism Model 2, only path *a* (WR-C to SA) was significant. All other paths and the indirect effect of weight-related criticism on engagement in moderate levels of physical activity via social anxiety were not significant.

Table 5

Summary of Mediation Analyses for Weight-Related Criticism (IV), Social Anxiety (Mediator), and Physical Activity (DV)

Path	β	<i>B</i>	<i>SE</i>	<i>p</i>	CIs for Indirect Effect		<i>R</i> ²
					Lower	Upper	
Model 1: Predicting Engagement in Vigorous Physical Activity							.16
PV-SA (<i>a</i> path)	1.30		.32	<.001			
SA-PA (<i>b</i> path)	-6.67	-.44	1.78	<.001			
Total Effect PV-PA (<i>c</i> path)	7.27	.16	5.32	.29			
Direct Effect PV-PA (<i>c'</i> path)	16.00	.35	5.42	.00			
Indirect Effect (<i>ab</i> path)					-15.50	-1.13*	
Model 2: Predicting Engagement in Moderate Physical Activity							.04
PV-SA (<i>a</i> path)	1.30		.32	<.001			
SA-PA (<i>b</i> path)	-3.09	-.22	1.80	.02			
Total Effect PV-PA (<i>c</i> path)	-2.94	-.07	5.02	.67			
Direct Effect PV-PA (<i>c'</i> path)	1.10	.03	5.48	.11			
Indirect Effect (<i>ab</i> path)					-12.32	2.06	

Note. **p* < .05

Confidence intervals not including zero indicate a statistically significant indirect effect at *p* < .05.

Discussion

This study examined the associations among peer victimization, weight-related teasing, social anxiety and self-reported physical activity. Specifically, this study examined a potential mechanism through which social anxiety may help explain the association between peer victimization and weight-related teasing and physical activity. Although

significant indirect effects were found (PV → SA → PA-V; WR-C → SA → PA-V) which suggest that social anxiety may influence the associations between peer victimization and vigorous physical activity and between weight-related criticism and vigorous physical activity in some capacity, these indirect effects did not offer support for the hypothesized mediation model.

Results did indicate that general peer victimization is associated with social anxiety. This is consistent with previous research on the relationship between peer problems and psychosocial functioning in youth (Hawker & Boulton, 2000). Results also indicate that social anxiety is associated with lower rates of participation in higher intensity physical activity. Taken together, this indirect effect may suggest that the mechanism through which social anxiety operates on the relationship between victimization and physical activity takes time to develop.

This idea is consistent with the conceptualization of how anxiety develops by Silverman, La Greca, and Wassterin (1995). They explain that a key component of anxiety is repeated exposure to the feared stimulus. Thus, it may be that repeated victimization by peers or repeated criticism by others leads to social anxiety over time which then influences or inhibits future behavior. This trajectory would lend support to the lack of association between peer victimization and weight-related criticism and physical activity in the current study. If the pathway from peer victimization and weight-related criticism to decreased physical activity engagement develops over time, a cross-sectional, correlational study would not capture this effect but offers justification for a longitudinal study that could clarify the sequence and timing of these effects.

These findings modify previous conclusions that anxiety symptoms do not play a role in the connection between peer victimization and children's engagement in physical activity levels (Storch et al., 2007). Due to the nature of peer victimization and weight-related criticism- it occurs in the context of a social relationship between individuals and often occurs in view of others (Craig & Pepler, 1995)- and due to the performance aspect inherent in physical activity, specifically assessing social anxiety may have captured effects that are otherwise absent when examining generalized anxiety or social physique anxiety. Anxious symptoms specifically tied to performance situations or evaluative contexts may be more closely related to peer victimization and physical activity respectively. Generalized anxiety may be too broad and social physique anxiety too narrow to detect these potential effects.

The results, indicating the relationships among peer victimization, social anxiety, and physical activity are stronger when examining vigorous physical activity compared to moderate physical activity, are interesting in light of recommendations that children should engage in 60 minutes of moderate to vigorous physical activity each day with vigorous intensity physical activity comprising at least 3 days per week (CDC, 2008). Understanding how psychosocial difficulties may differentially affect engagement in specific types of physical activity is important because there is some debate regarding the type and dose of physical activity required to curb adverse health outcomes (Warburton, Nicol, & Bredin, 2006). If engagement in vigorous intensity physical activity results in better health outcomes, as some research suggests, then it would be important to target barriers specific to participation in these types of physical activity. The results of this study

provide preliminary evidence that addressing peer victimization and social anxiety may increase participation in higher intensity physical activity and may offer one avenue to more effectively incorporate exercise components in health promotion or obesity prevention programs.

Surprisingly, and in contrast with previous literature (Storch et al., 2007) peer victimization and weight-related criticism alone were not related to physical activity engagement in this cross sectional, correlational study. This raises questions regarding the relationship among these variables. Future research could examine possible explanations for the lack of the expected negative correlation between peer victimization and physical activity in this study, including the potential impact of existent social support. Reynolds et al. (1990) found that direct social support is an important predictor of youth's engagement in physical activity. Thus, it may be that children who reported peer victimization in this study may have had a supportive network of friends or received support from within a dyadic friendship which may have encouraged participation in physical activity. Support may also be available from other sources, including parents (Davison, Cutting, & Birch, 2003), teachers, coaches, or other adults. Thus, while previous research has shown that peer victimization is an important determinant of physical activity engagement among youth, examining how social support may affect this relationship may be an important future endeavor in research in this area. In the context of the present study, it may be that the buffering effect of social support declines over time leading youth to develop social anxiety symptoms that may inhibit future participation in physical activity.

Self-efficacy or any feelings of self-competence in the domain of athletics or

exercise has been examined in relation to physical activity and might have played a role in this study. The current study did not examine self-efficacy but other research results have suggested that self-efficacy can be an important influence on willingness to participate in physical activity (Sallis, Prochaska, & Wendell, 2000; Trost, Kerr, Ward & Pate, 2001). For example, in a review of self-efficacy as a correlate of engagement in exercise, McAuley and Blissmer (2000) found that self-efficacy based interventions or enhancing self-efficacy was related to increased physical activity level in some studies. Thus, while self-efficacy may be one area to target in terms of increasing participation in physical activity, given the context of the findings of the present study, it may be important to examine how the social cognitive aspects of self-efficacy may be linked to social anxiety to enhance intervention efforts to promote increased physical activity.

There are several limitations to the current study. The current study is cross-sectional in design and thus precludes some conclusions regarding the nature of the existent relationships. Another limitation of the current study includes the mechanism through which the authors captured children's engagement in physical activity. The measurement tool utilized, although demonstrated in the past to be an adequate measure of physical activity, leaves some ambiguity in the extent to which children actually engaged in varying intensity levels of physical activity. Children's subjective interpretations of items such as "football" does not necessarily capture differences in playing "catch" or a competitive game that involves higher intensity physical exertion. Thus, it is important to use caution in interpreting the accuracy with which the measure captures minutes engaged in high intensity activities. Physical activity is also not captured

using an objective measure but rather relies on self-report. While research has shown self-report to be a sufficient and acceptable method of measuring physical activity engagement, a more objective measure, such as accelerometer data, may help clarify one's pattern of physical activity and more clearly demonstrating the effect of psychosocial factors on physical activity.

Despite the limitations to the present study, the results offer important information to consider in the design and implementation of pediatric health promotion prevention and intervention efforts. First, given the emphasis on broad-based public health prevention efforts for pediatric obesity, it is important to note barriers that prevent both overweight and non-overweight children from engaging in physical activity. Goran, Reynolds, and Lindquist (1999) examined the role of physical activity in the prevention of childhood obesity and concluded that physical activity is a multidimensional concept and that there are numerous determinants to children's decisions to engage or not engage in such activity. The current study highlights one potential determinant, social anxiety, and offers preliminary support for the notion that social anxiety may serve as a barrier to engagement in vigorous intensity physical activity. Specifically, the results are consistent with the conceptualization that peer victimization and weight-related criticism may lead children to feel more socially anxious which inhibits them from engaging in various forms of physical activity. Social anxiety may influence performance in general, but may also influence performance tied to vigorous free play, sports, and similar physical activities.

Second, identifying social anxiety as a potential barrier to physical activity engagement offers another specific component for programming. Prevention and

intervention efforts may need to include social cognitive or cognitive behavioral components that specifically target social anxiety and its corresponding symptoms in order to maximize benefit from exercise interventions. Promoting group exercise opportunities with the absence of peer victimization via more close supervision or close monitoring may also be helpful in increasing children's physical activity. Overall, identifying youth with sub-clinical or clinical levels of social anxiety may influence one's approach to increasing engagement in physical activity.

References

- Albano, A. M., Chorpita, B. F., & Barlow, D. H. (2003). Childhood anxiety disorders. In E. Mash & R. Barkley (Eds.). *Child Psychopathology (2nd ed.)*.(pp. 279-329). New York: Guilford.
- Atlantis, E., Chow, C. M., Kirby, A., & Fiatarone Singh, M. A. (2006). Efficacy of exercise for treating overweight in children and adolescents: A systematic review. *International Journal of Obesity, 30* (7), 1027-1040.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51* (6), 1173-1182.
- Bauer, K. W., Yang, W. Y., & Austin, B. S. (2004). “How can we stay healthy when you’re throwing all of this in front of us?” Findings from focus groups and interviews in middle schools on environmental influences on nutrition and physical activity. *Health Education & Behavior, 31* (1), 33-46.
- Beidel, D. C., & Turner, S. M. (1998). *Shy children, phobic adults: Nature and treatment of social phobia*. Washington, DC: American Psychological Association.
- Berry, D., Sheehan, R., Heschel, R., Knalf, K., Melkus, G., & Grey, M. (2004). Family-based interventions for childhood obesity: A review. *Journal of Family Nursing, 10* (4), 429-449.
- Centers for Disease Control and Prevention (2008). *BMI calculator for child and teen: English version*. Retrieved June 3, 2009, from

- <http://apps.nccd.cdc.gov/dnpabmi/Calculator.aspx>
- Centers for Disease Control and Prevention (2008). How much physical activity do children need? Retrieved October 1, 2009 from <http://www.cdc.gov/physicalactivity/everyone/guidelines/children.html>
- Centers for Disease Control and Prevention (2009). About BMI for children and teens. Retrieved March 12, 2009 from http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/measuring_children.html
- Craig, W.M., & Pepler, D.J. (1995). Peer processes in bullying and victimization: A naturalistic study. *Exceptionality Education in Canada, 4*, 81-95.
- Crick, N. R., & Grotpeter, J. K. (1996). Children's treatment by peers: Victims of relational and overt aggression. *Development and Psychopathology, 8* (2), 367-380.
- Daniels, S. R. (2006). The consequences of childhood overweight and obesity. *The Future of Children, 16* (1), 47-67.
- Davison, K.K., Cutting, T.M., & Birch, L.L. (2003). Parents' activity-related parenting practices predict girls' physical activity. *Medicine and Science in Sports and Exercise, 35* (9), 1-12.
- Epstein, L. H., Paluch, R. A., Roemmich, J. N., & Beecher, M. D. (2007). Family-based obesity treatment, then and now: Twenty-five years of pediatric obesity treatment. *Health Psychology, 26* (4), 381-391.
- Epstein, L. H., Wing, R. R., Koeske, R., & Valoski, A. (1984). Effects of diet plus

- exercise on weight change in parents and children. *Journal of Consulting and Clinical Psychology, 52*, 429–437.
- Faith, M. S., Leone, M. A., Ayers, T. S., Moonseong, H., & Pietrobelli, A. (2002). Weight criticism during physical activity, coping skills, and reported physical activity in children. *Pediatrics, 110*, e23.
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39* (2), 175-191.
- Franklin, J., Denyer, G., Steinbeck, K. S., Caterson, I. D., & Hill, A. J. (2006). Obesity and risk of low self-esteem: A statewide survey of Australian children. *Pediatrics, 116* (6), 2481-2487.
- Ginsburg, G. S., La Greca, A. M., & Silverman, W. K. (1998). Social anxiety in children with anxiety disorders: Relation with social and emotional functioning. *Journal of Abnormal Child Psychology, 26* (3), 175-185.
- Haines, J., Neumark-Sztainer, D., & Thiel, L. (2007). Addressing weight-related issues in an elementary school: What do students, parents, and school staff recommend? *Eating Disorders: The Journal of Treatment and Prevention, 15* (1), 5-21.
- Hawker, D. S. J., & Boulton, M. J. (2000). Twenty years' research on peer victimization and psychosocial maladjustment: A meta-analytic review of cross-sectional studies. *Journal of Child Psychology and Psychiatry, 41* (4), 441-455.
- Hayden-Wade, H. A., Stein, R. I., Ghaderi, A., Saelens, B. E., Zabinski, M. F., & Wilfley, D. E. (2005). Prevalence, characteristics, and correlates of teasing experiences

- among overweight children vs. non-overweight peers. *Obesity Research*, 13, 1381-1392.
- Henker, B., Whalen, C. K., Jammer, L. D., & Delfino, R. J. (2002). Anxiety, affect, and activity in teenagers: Monitoring daily life with electronic diaries. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41 (6), 660-670.
- Hopper, C. A., Munoz, K. D., Gruber, M. B., MacConnie, S., Schonfeldt, B., & Shunk, T. (1996). A school-based cardiovascular exercise and nutrition program with parent participation: An evaluation study. *Children's Health Care*, 25 (3), 221-235.
- Jelalian, E., & Saelens, B. E. (1999). Empirically supported treatments in pediatric psychology: Pediatric obesity. *Journal of Pediatric Psychology*, 24, 223-248.
- La Greca, A. M., & Stone, W. L. (1993). Social anxiety scale for children- revised. Factor structure and concurrent validity. *Journal of Clinical Child Psychology*, 22 (1), 17-27.
- Lemmon, C. R., Ludwig, D. A., Howe, C. A., Ferguson-Smith, A., & Barbeau, P. (2007). Correlates of adherence to a physical activity program in young African-American girls. *Obesity*, 15 (3), 695-703.
- Luepker, R. V., Perry, C. L., & McKinlay, S. M. (1996). Outcomes of a field trial to improve children's dietary patterns and physical activity: The Child and Adolescent Trial for Cardiovascular Health (CATCH). *JAMA: Journal of the American Medical Association*, 275, 768-776.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002).

- A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, 7 (1), 83-104.
- Malecka-Tendera, E., & Mazur, A. (2006). Childhood obesity: A pandemic of the twenty-first century. *International Journal of Obesity*, 30, S1-S3.
- McAuley, E., Blissmer, B. (2000). Self-efficacy determinants and consequences of physical activity. *Exercises and Sport Sciences Reviews*, 28 (2), 85-88.
- McMurray, R. G., Harrell, J. S., Bangdiwala, S. I., Bradley, C. B., Deng, S., & Levine, A. (2002). A school-based intervention can reduce body fat and blood pressure in adolescents. *Journal of Adolescent Health*, 31 (2), 125-132.
- Neumark-Sztainer, D., Story, M., Hannan, P. J., & Rex, J. (2003). New moves: A school-based obesity prevention program for adolescent girls. *Preventive Medicine: An International Journal Devoted to Practice and Theory*, 37 (1), 41-51.
- Ogden, C. L., Carroll, M. D., & Flegal, K. M. (2008). High body mass index for age among US children and adolescents, 2003-2006. *Journal of the American Medical Association*, 299, 2401-2405.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36, 717-731.
- Puhl, R. M., & Latner, J. D. (2007). Stigma, obesity, and the health of the nation's children. *Psychological Bulletin*, 133 (4), 557-580.
- Reynolds, K.D., Killen, J.D., Bryson, S.W., Maron, D.J., Taylor, C.B., Maccoby, N. et al. (1990). Psychosocial predictors of physical activity in adolescents. *Preventive*

- Medicine*, 19 (5), 541-551.
- Ridgers, N. D., Fazey, D. M. A., & Fairclough, S. J. (2007). Perceptions of athletic competence and fear of negative evaluation during physical education. *British Journal of Educational Psychology*, 77 (2), 339-349.
- Sallis, J.F., Prochaska, J.J., & Taylor, W.C. (2002). A review of correlates of physical activity of children and adolescents. *Medicine and Science in Sports and Exercise*, 32 (5), 963-975.
- Sallis, J. F., Strinkmiller, P. K., Harsha, D. W., Feldman, H. A., Ehlinger, S., Stone, E. J., et al. (1996). Validation of interviewer- and self-administered physical activity checklists for fifth grade students. *Medicine & Science in Sports & Exercise*, 28 (7), 840-851.
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, 7 (4), 422-445.
- Silverman, W., La Greca, A.M., & Wassterin, S. (1995). What do children worry about? Worries and their relations to anxiety. *Child Development*, 66, 671-686.
- Slee, P. T. (1994). Situational and interpersonal correlates of anxiety associated with peer victimization. *Child Psychiatry & Human Development*, 25 (2), 97-107.
- Stice, E., Shaw, H., & Marti, C. N. (2006). A meta-analytic review of obesity prevention programs for children and adolescents: The skinny on interventions that work. *Psychological Bulletin*, 132, 667-691.
- Storch, E. A., Barlas, M. E., Dent, H. C., & Masia, C. L. (2002). Generalization of social

- anxiety to sport: An investigation of elementary aged Hispanic children. *Child Study Journal*, 32 (2), 81-88.
- Storch, E. A., Brassard, M. R., & Masia-Warner, C. L. (2003). The relationship of peer victimization to social anxiety and loneliness in adolescence. *Child Study Journal*, 33 (1), 1-18.
- Storch, E. A., Crisp, H., Roberti, J. W., Bagner, D. M., & Masia-Warner, C. (2005). Psychometric evaluation of the social experience questionnaire in adolescents: Descriptive data, reliability, and factorial validity. *Child Psychiatry & Human Development*, 36 (2), 167-176.
- Storch, E. A., Eisenberg, P. S., Roberti, J. W., & Barlas, M. E. (2003). Reliability and validity of the Social Anxiety Scale for Children- Revised for Hispanic children. *Hispanic Journal of Behavioral Sciences*, 25 (3), 410-422.
- Storch, E. A., & Masia-Warner, C. L. (2004). The relationship of peer victimization to social anxiety and loneliness in adolescent females. *Journal of Adolescence*, 27 (3), 351-362.
- Storch, E. A., Milson, V. A., DeBraganza, N., Lewin, A., Geffken, G. R., & Silverstein, J. H. (2007). Peer victimization, psychosocial adjustment, and physical activity in overweight and at-risk-for-overweight youth. *Journal of Pediatric Psychology*, 32 (1), 80-89.
- Strauss, R. (2000). Childhood obesity and self-esteem. *Pediatrics*, 105, e15.
- Teachman, B. A., & Allen, J. P. (2007). Development of social anxiety: Social interaction predictors of implicit and explicit fear of negative evaluation. *Journal of Abnormal*

- Child Psychology*, 35 (1), 63-78.
- Thompson, K. J., Cattarin, J., Fowler, B., & Fisher, E. (1995). The Perception of Teasing Scale (POTS): A revision and extension of the Physical Appearance Related Teasing Scale (PARTS). *Journal of Personality Assessment*, 65 (1), 146-157.
- Trost, S.G., Kerr, L.M., Ward, D.S., & Pate, R.R. (2001). Physical activity and determinants of physical activity in obese and non-obese children. *International Journal of Obesity*, 25 (6), 822-829.
- Vernberg, E. M., Abwender, D. A., Ewell, K. K., & Beery, S. H. (1992). Social anxiety and peer relationships in early adolescence: A prospective analysis. *Journal of Clinical Child Psychology*, 21 (2), 189-196.
- Warburton, D.E.R., Nicol, C.W., & Bredin, S.S.D. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal*, 174 (6), 801-809.
- Warschburger, P. (2005). The unhappy obese child. *International Journal of Obesity*, 29, S127-S129.

Appendix A

The Social Experience Questionnaire- Self Report

DIRECTIONS: Here is a list of things that sometimes happen to kids your age at school. How often do they happen to you at school?

Example:

A. How often do you eat lunch at school?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
B. How often does your class go outside to play?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
1. How often does another kid give you help you when you need it?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
2. How often do you get hit by another kid at school?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
3. How often do other kids leave you out on purpose when it is time to play or do an activity?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
4. How often does another kid yell at you and call you mean names?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
5. How often does another kid try to cheer you up when you feel sad or upset?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
6. How often does a kid who is mad at you try to get back at you by not letting you be in their group anymore?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time

7. How often do you get pushed or shoved by another kid at school?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
8. How often does another kid do something that makes you feel happy?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
9. How often does a classmate tell lies about you to make other kids not like you anymore?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
10. How often does another kid kick you or pull your hair?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
11. How often does another kid say they won't like you unless you do what they want you to do?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
12. How often does another kid say something nice to you?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
13. How often does a kid try to keep others from liking you by saying mean things about you?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
14. How often does another kid say they will beat you up if you don't do what they want you to do?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time
15. How often do other kids let you know that they care about you?	1 Never	2 Almost Never	3 Sometimes	4 Almost All The Time	5 All The Time

Appendix B

Perceptions of Teasing Scale

Below are situations that kids your age could experience. Please circle how often you have had the experience from kindergarten until now. If you have had the experience, please also circle how much it upset you. **If you have never experienced the situation, please do not circle how much it upset you.**

1a. People made fun of you because you were heavy.	1 Never	2	3 Sometimes	4	5 Very Often
1b. If this happened to you, how upset were you?	1 Not Upset	2	3 Somewhat Upset	4	5 Very Upset
2a. People made jokes about you being too heavy.	1 Never	2	3 Sometimes	4	5 Very Often
2b. If this happened to you, how upset were you?	1 Not Upset	2	3 Somewhat Upset	4	5 Very Upset
3a. People laughed at you for trying out for sports because you were heavy.	1 Never	2	3 Sometimes	4	5 Very Often
3b. If this happened to you, how upset were you?	1 Not Upset	2	3 Somewhat Upset	4	5 Very Upset
4a. People called you names like "Fatso."	1 Never	2	3 Sometimes	4	5 Very Often
4b. If this happened to you, how upset were you?	1 Not Upset	2	3 Somewhat Upset	4	5 Very Upset
5a. People pointed at you because you were overweight.	1 Never	2	3 Sometimes	4	5 Very Often
5b. If this happened to you, how upset were you?	1 Not Upset	2	3 Somewhat Upset	4	5 Very Upset
6a. People snickered about your heaviness when you walked into a	1 Never	2	3 Sometimes	4	5 Very

room alone.					Often
6b. If this happened to you, how upset were you?	1 Not Upset	2	3 Somewhat Upset	4	5 Very Upset
7a. People made fun of you by repeating something you said because they thought it was dumb.	1 Never	2	3 Sometimes	4	5 Very Often
7b. If this happened to you, how upset were you?	1 Not Upset	2	3 Somewhat Upset	4	5 Very Upset
8a. People made fun of you because you were afraid to do something.	1 Never	2	3 Sometimes	4	5 Very Often
8b. If this happened to you, how upset were you?	1 Not Upset	2	3 Somewhat Upset	4	5 Very Upset
9a. People said you acted dumb.	1 Never	2	3 Sometimes	4	5 Very Often
9b. If this happened to you, how upset were you?	1 Not Upset	2	3 Somewhat Upset	4	5 Very Upset
10a. People laughed at you because you didn't understand something.	1 Never	2	3 Sometimes	4	5 Very Often
10b. If this happened to you, how upset were you?	1 Not Upset	2	3 Somewhat Upset	4	5 Very Upset
11a. People teased you because you didn't get a joke.	1 Never	2	3 Sometimes	4	5 Very Often
11b. If this happened to you, how upset were you?	1 Not Upset	2	3 Somewhat Upset	4	5 Very Upset

Appendix C

Social Anxiety Scale for Children- Revised

This is not a test, there are no right or wrong answers. Please answer each item as honestly as you can.

Example:

A. I like summer vacation.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
B. I like to eat spinach.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
1. I worry about doing something new in front of other kids.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
2. I like to play with other kids.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
3. I worry about being teased.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
4. I feel shy around kids I don't know.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
5. I feel that other kids talk about me behind my back.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
6. I only talk to kids I know really well.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time

7. I like to read.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
8. I worry about what other kids think of me.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
9. I'm afraid that other kids will not like me.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
10. I get nervous when I talk to kids I don't know very well.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
11. I like to play sports.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
12. I worry about what other children say about me.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
13. I get nervous when I talk to new kids.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
14. I worry that other kids don't like me.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
15. I am quiet when I'm with a group of kids.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
16. I like to do things by myself.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time

17. I feel that kids are making fun of me.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
18. If I get into an argument with another kid, I worry that he or she won't like me.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
19. I'm afraid to invite others to my house because they might say no.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
20. I feel nervous when I'm around certain kids.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
21. I feel shy even with kids I know well.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time
22. It's hard for me to ask other kids to play with me.	1 Not At All	2 Hardly Ever	3 Sometimes	4 Most Of The Time	5 All The Time

Appendix D

Self-Administered Physical Activity Checklist

Please let us know how long you completed each activity **before, during, and after school yesterday.** If you did not do the activity, write “0 Hours 0 Minutes.”

Activity	Before School	During School	After School
Bicycling	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Swimming Laps	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Gymnastics: Bars, beams, tumbling, trampoline	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Exercises: Push-ups, sit-ups, jumping jacks	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Basketball	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Baseball/Softball	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Football	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Soccer	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Volleyball	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Racquet sports: Badminton, tennis	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes

Ball Playing: Four square, dodgeball, kickball	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Games: Chase, tag, hopscotch	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes

Activity	Before School	During School	After School
Outdoor Play: Climbing trees, hide and seek	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Water play (in swimming pool, ocean, or lake)	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Jump Rope	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Dance	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Outdoor chores: Mowing, raking, gardening	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Indoor chores: Mopping, vacuuming, sweeping	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Mixed walking/running	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Walking	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
Running	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes

Are there any physical activities you did yesterday that we forgot?

Other Activities	Before School	During School	After School
	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes
	__ Hours __ Minutes	__ Hours __ Minutes	__ Hours __ Minutes

Please let us know about how long you did each activity before and after school yesterday. If you did not do the activity, write “_0_ Hours _0_ Minutes.”

Yesterday:

Activity	Before school	After school
Watched T.V./Movies	____ Hours ____ Minutes	____ Hours ____ Minutes
Played video/computer games (NOT <i>Wii</i> or <i>Dance Dance Revolution</i>)	____ Hours ____ Minutes	____ Hours ____ Minutes