

PEER VICTIMIZATION, PHYSICAL ACTIVITY, AND SOCIAL-PSYCHOLOGICAL
ADJUSTMENT IN OBESE YOUTH

By

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A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

2007

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To my best friend, Jocelyn Lee

ACKNOWLEDGMENTS

I would like to thank Jocelyn Lee for her assistance and constant support through this difficult process. I would to thank Davina Lennard, Adrienne Bunton, and Alicia Ivory for over a decade of friendship and love. I would like to thank my dissertation committee chair, Dr. Mark Fondacaro, for years of guidance and mentorship. I would also like to thank and acknowledge Dr. Eric Storch for tireless efforts, leadership, and encouragement during this process and Drs. Greg Neimeyer, Lanza-Kaduce, and Scott Miller for being warm and supportive committee members. Last but not least, I would like to acknowledge my faith which made this project possible and thank all others who provided comfort and solace in times of need.

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Abstract of Dissertation Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Doctor of Philosophy

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By

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December 2007

Chair: Mark Fondacaro
Major: Counseling Psychology

To understand peer victimization, some researchers have suggested certain qualities of victimized children and adolescents (e.g., shyness) may invite or reinforce aggression from bullies. However, a factor that has received relatively little empirical attention is physical factors that influence the physical appearance of a victimized child or adolescent (i.e., obesity).

The present research was designed to address this and examine the relationship between peer victimization, physical activity, and social-psychological adjustment in obese youth. The research project examines if peer victimization predicts physical activity. The research project also examines if this relationship is mediated by sociological adjustment (i.e., depression, anxiety, and loneliness) or moderated by age and/or race. Such data may prove valuable for physicians and mental health clinicians working with victimized obese youth.

CHAPTER 1 INTRODUCTION

Peer Victimization Definitions

Over the past decade, research has improved the understanding of the dynamics, nature, and consequences of peer victimization in childhood and adolescence for both victims and perpetrators. From this research, the definition of peer victimization has expanded to include other aspects besides physical assaults. Traditional definitions of peer victimization primarily focused on physical acts of aggression (e.g., kicking, punching, slapping). Research studies have shown that a definition that includes both overt and relational assaults (i.e., spreading rumors, damaging relationships, verbal abuse) more fully captures peer victimization (Crick & Grotpeter, 1996).

Consequences of Peer Victimization

Research has also linked peer victimization to negative social-psychological adjustment in children and adolescents. More specifically, studies have found positive correlations between peer victimization and depression, social and general anxiety, and loneliness in child and adolescent samples (Bond, Carlin, Thomas, Rubin, & Patton, 2001; Crick & Bigbee, 1998; Crick & Grotpeter, 1996; Nansel et al., 2001; Storch, Nock, Masia, & Barlas, 2003; Storch, Zelman, Sweeny, Danner, & Dove, 2002; Storch et al., 2004a, b; Storch et al., 2006a; Storch et al., 2007).

Peer Victimization Risk Factors

In effort to understand the causes of peer victimization and to determine why certain children are bullied, several researchers have suggested that victimized children may possess certain qualities that invite or reinforce aggression from bullies. For example, victims tend to be socially passive and compliant (Perry, Kussel, & Perry, 1988; Schwartz, Dodge, & Coie, 1993), physically weak (if boys), low in self-esteem (Olweus, 1992), average or poor students, and less

popular in school (Pellegrini, 1998). Bullies are often reinforced when victims offer little to no resistance, display signs of distress, and/or do not retaliate (Schwartz et al., 1993). Additionally, socially ostracized children, like those with special needs, are particularly vulnerable to peer victimization. For example, learning-disabled children report higher levels of peer victimization and aggression, and have fewer friends than children who do not have learning disabilities (Martlew & Hodson, 1991; Nabuzoka & Smith, 1993). Little (2001) completed a study that showed children with Asperger's disorder and nonverbal learning disorders reported higher rates of peer victimization than those without Asperger's or nonverbal learning disabilities.

Furthermore, some children with overt physical differences are often targets for peer victimization (Storch et al., 2004a). For example, children with endocrine disorders, specifically gynecomastia, precocious puberty, delayed puberty, and short stature have overt physical differences associated with their disorder, which may cause them to be targets for peer aggressors; additionally, children with chronic medical conditions may display anxiety symptoms and poor social skills which increases their vulnerability to being victimized (Storch et al., 2004a). A study on children with obsessive-compulsive disorder (OCD) showed that not only was peer victimization a common experience (with more than one quarter being regularly victimized), relative to children with diabetes or healthy children (Storch et al., 2006b).

Peer Victimization and Obesity

Whereas research efforts have improved the understanding of non-physical characteristics of sufferers of peer victimization, little empirical attention has been given to physical characteristics of victims. One physical characteristic that may invite peer victimization is obesity. There are several reasons why peer victimization may be a frequent experience in the life of obese youth. First, obese youth may be labeled as "unattractive" or different, providing bullies with a rationale to victimize. Second, obese youth may be hesitant or unable to participate

in school activities or interact with peers due to a fear of rejection or physical limitations, which, subsequently, may lead to a smaller social network of friends. Additionally, physical limitations, medical issues, and fewer friends may contribute to the development of social anxiety and low self-esteem. These factors make obese youth prime candidates for peer victimization (Storch et al., 2007).

Besides obesity being a risk factor for peer victimization, it may also impact obese youth's desire to participate in physical activities. For example, obese, victimized youth may avoid physical activity that is not closely monitored (i.e., physical education classes or after-school sports) due to the frequency of peer victimization occurring during these events (Frey et al., 2005). Additionally, peer victimization of obese youth may reduce intrinsic motivation for physical activity due to fear of peer victimization during activities (Faith, Leone, Moonseong, & Pietrobelli, 2002) Whereas there is evidence that weight-based peer victimization may lead to negative attitudes about sports and reduced amounts of physical activity (Faith et al., 2002), overall, there is little research on how peer victimization affects physical activity for obese youth.

Storch et al. (2007) examined the relationships between physical activity, peer victimization, and child, adolescent, and parental reports of psychosocial adjustment in at-risk-for overweight and overweight youth. Participants (child and parent) completed measures on peer victimization, depression, anxiety, social physique anxiety, loneliness and physical activity and both internalizing and externalizing behaviors (Storch et al., 2007). Results showed peer victimization was positively correlated to youth's reported depression, anxiety, social physique anxiety, loneliness and parental reports of internalizing and externalizing symptoms; additionally, peer victimization was negatively related to physical activity and depressive

symptoms and loneliness mediated the relationship between peer victimization and physical activity (Storch et al., 2007).

Peer Victimization, Obesity, and Age

The current research project will investigate how age may moderate the relationship between peer victimization and physical activity. Younger children (aged 8-12 years) may not be able to avoid physical activity as much as an older adolescent (aged 13-17 years). It is hypothesized that older adolescents have more experience addressing bullying behaviors and subsequently, have developed more coping strategies than a younger child. Furthermore, an older adolescent may have more autonomy in deciding to participate in physical activity than a younger child. In regards to directionality, it is hypothesized that older age (adolescents between the ages of 13-17 years) will positively moderate the relationship between peer victimization and physical activity.

Peer Victimization, Obesity, and Race

Research has shown that children from minority groups engage in less activity than non-minority groups (Young-Hyman, Schlundt, Herman-Wenderoth, & Bozylinski, 2003) but there has been little empirical consideration as to how race may moderate the relationship between peer victimization and physical activity. Considering that obese youth may avoid physical activity due to peer victimization, the additional risk factor of being a minority may further compromise or impact the relationship between peer victimization and physical activity. Therefore, it is hypothesized that race (categorized as minority vs. non-minority) will negatively moderate the relationship between peer victimization and physical activity.

Research Aims

Therefore, the primary purpose of this study is to examine the relationships among peer victimization, social-psychological adjustment, and physical activity in obese youth. Goals: (1)

to examine the relationship between peer victimization and physical activity, (2) to examine the relationship between peer victimization and social-psychological adjustment indices, (3) to determine if the relationship between peer victimization and physical activity is moderated by age, (4) to determine if the relationship between peer victimization and physical activity is moderated by race, and (5) to determine if the relationship between peer victimization and physical activity is mediated by social-psychological adjustment.

Children and adolescents were aged 8-17 years and were the targeted participant group. Inclusion criteria: (1) aged 8-17 years, (2) able to read questionnaires, (3) attended a scheduled appointment at the University of Florida Pediatric Lipid Clinic, and (4) accompanied by a parent or guardian. Exclusion criteria: (1) diagnosed as mentally disabled or as having a psychotic disorder, (2) unable to read the questionnaire packets, and (3) was not English speaking.

Measurements

The following is a list of the measures that were specific to the current study and were administered to participants, starting with the questionnaires the children and adolescents completed: Schwartz Peer Victimization and Aggression Scale (Schwartz, Farver, Chang, & Lee-Shin, 2002), Children's Depression Inventory – Short form (Kovacs, 1992), The Multidimensional Anxiety Scale for Children (March, Parker, Sullivan, Stallings, & Conners, 1997), Asher Loneliness Scale (Asher & Wheeler, 1985), and the SPARK Physical Activity Measure (Sallis et al., 1993). Parents completed a demographic form and the Child Behavior Checklist (Achenbach, 1991).

CHAPTER 2 LITERATURE REVIEW

Peer Victimization

Peer victimization in childhood and adolescence is becoming a serious and widespread problem (Storch & Ledley, 2005). Recent research has estimated peer victimization to affect at least 10% of children and adolescents (Kochenderfer & Ladd, 1996; Perry, Williard, & Perry, 1990) with some rates being estimated as high as 20-30% (Nansel et al., 2004; Storch & Masia-Warner, 2004). For example, in a recent study, 88% of students from Midwestern junior high schools and high schools reported observing bullying behaviors (Espelage & Swearer, 2003). In the same study, 25% of 4th-6th graders reported bullying another student in the prior 3 months while almost 30% of 6th-10th graders reported having frequent involvement in bullying as either a bully (13%) or a victim (10.6%; Espelage & Swearer, 2003).

Research has defined peer victimization as aggressive acts, occurring over time, and reflecting an imbalance of power between bully and victim (Espelage & Swearer, 2003; Olweus, 1992). The aggression is primarily proactive—bullies direct their aggression at victims in order to obtain a desired outcome like gaining property, personal possessions, power, or affiliation (Espelage & Swearer, 2003). Whereas there have been different definitions of peer victimization, most now include physical, verbal, and/or relational aggression occurring over time, either directly or indirectly (Espelage & Swearer, 2003). Furthermore, peer victimization can be framed in a social-ecological perspective, reflecting interplay of inter- and intra-individual factors consisting of peer, family, school, and community features (Bronfenbrenner, 1979).

Previous research on peer victimization has focused on overt forms of aggression (e.g., hitting, kicking, physical intimidation) while other harmful behaviors (e.g., spreading mean rumors, having peers excluded from social groups) were ignored (Crick & Grotpeter, 1996;

Storch & Masia-Warner, 2004). Furthermore, studies have shown relational aggression to be more common in girls than boys and relational aggression appears to be effective in hindering the intimacy goals typical of girl peer relationships (Crick, Casas, & Mosher, 1997). Therefore, including relational aggression into the peer victimization definition will provide a more comprehensive view of peer victimization than provided in earlier research (Crick et al., 1997; Crick & Grotpeter, 1996).

Previous studies have focused on primarily overt physical aggression with boys (e.g., Olweus, 1992), excluding peer victimization experiences that may be common for girls. Recent studies have shown relational aggression, which covers hurtful manipulation and damage to peer relationships, can be just as harmful as physical attacks (Crick & Grotpeter, 1996). In fact, both boys and girls have nominated relational aggressive behaviors as hostile and as frequent as physical aggressive acts (Crick, Espelage & Swearer, 2003; Crick & Grotpeter, 1996; Storch & Masia-Warner, 2004). Relational aggression has been shown to be highly aversive and damaging to children and may contribute to emotional difficulties (Crick, Casas, & Ku, 1999; Crick et al., 1997; Pellegrini, 1998; Schwartz et al., 1993; Storch & Masia, 2001; Storch et al., 2004; Storch et al., 2007). In fact, relational aggression has been shown to relate more strongly to psychological distress (e.g., depression, anxiety) than overt aggression (Crick et al., 1999; Crick et al., 1997).

Relational aggression is more likely to damage valued goals (e.g., large social network of friends, intimate peer relationships, popularity). Relational aggression is stable over time, which can potentially cause more harm in the long term (Crick, 1996). One of the reasons relational aggression may be more stable than overt aggression over time is due to the increasing strength of penalties of physical aggressive acts (e.g., serious injury, legal sanctions; Prinstein, Boergers,

& Vernberg, 2001). Also, cognitive and physical development is another important factor. Victims are undergoing physical strength development that could lead to worst outcomes for aggressors (i.e., arrest, retaliation) so perpetrators often use relational forms of peer victimization (Prinstein et al., 2001). Additionally, cognitive developments facilitate a better understanding for perpetrators of the consequences of overt peer victimization (Prinstein et al., 2001). Furthermore, self-disclosure in peer relationships increases with age, providing private information that can be used as potential ammunition (Prinstein et al., 2001).

Consequences of Peer Victimization for Children and Adolescents

Overall, all forms of peer victimization have been found to be associated with adverse physical, emotional, and social development (Nansel et al., 2004) including poor future school adjustment (Crick & Bigbee, 1998), and psychological and mental health problems (Storch & Ledley, 2005; Wolke, Woods, Bloomfield, & Karstadt, 2000). Nansel et al. (2004) reviewed research from Australia, Finland, and Norway that showed that psychosocial struggles may be associated with peer victimization and persist into later adolescence and even adulthood.

Poor future school adjustment has been related to the magnitude of the bullying—frequent, intense bullying is associated with more school adjustment problems (Wolke et al., 2000). A problematic peer relationship, caused by peer victimization, can interfere with learning (Nansel et al., 2004). Also, victims may develop pejorative attitudes toward their peers, possibly leading to self-control problems, anger, and potential impulsive or oppositional behavior used to retaliate against other peers (Prinstein et al., 2001).

Peer Victimization, Consequences, and Adulthood

Due to the importance of belongingness, childhood behavior and social experiences are essential in development (Khatri, Kupersmidt, & Patterson, 2000; Sullivan, 1953). Bullied victims have fewer opportunities to develop appropriate social and coping skills, leading them to

be even more vulnerable to the painful effects of peer victimization (Khatri et al., 2000). Having successful peer relationships and romantic relationships is a developmental task beginning in childhood and persisting into early adulthood (Masten, 2005). Successful developmental tasks related to peer functioning become adulthood tasks for judging competence and resilience by self and society; peer rejection and peer systems may function as mediating or moderating adult processes leading toward or away from adult psychopathology (Masten, 2005). Furthermore, obese girls are at higher risk of developing disordered eating patterns, are less likely to marry or finish high school, and have lower incomes as adults (Jackson, Grilo, & Masheb, 2002; Janssen, Craig, Boyce, & Pickett, 2004).

In a study conducted in 2006, 226 adult participants from a Mood Disorder Unit outpatient depression clinic that met the DSM-IV criteria for depression and experienced peer victimization as a youth were examined to assess comorbidity between depression and bullying (Gladstone, Parker, & Malhi, 2006). Over a quarter of the sample reported peer victimization as youth and were more likely to be currently unemployed or receiving sick benefits from their employment (Gladstone et al., 2006). Furthermore, peer victimized participants were more likely to identify other childhood stressors including more difficult relationships with their parents, personal illness or disability, and being involved in a traumatic event (Gladstone et al., 2006). In an regression analysis, three predictor variables (behavioral inhibition, illness or disability, and high parental overcontrol) contributed unique variance to peer victimization more so than the other childhood risk factors; additionally, peer victimization reports were strongly correlated both directly and indirectly to high levels of comorbid anxiety (Gladstone et al., 2006).

Peer Victimization, Consequences, and Relationships

In a meta-analysis, peer victimization was shown to maintain depression and threats to social bonds (e.g., relational aggression) and can contribute to depression, low self-esteem, and

anxiety (Hawker & Boulton, 2000). Additionally, loneliness, depression, anxiety, and low self-esteem are also related to peer relationship difficulties like submissiveness, social withdrawal, and unpopularity with peers (Hawker & Boulton, 2000). In this meta-analysis, peer victimization has been related to depressive symptoms ($r=.29-.45$), loneliness ($r=.25-.32$), and internalizing and externalizing problems ($r=.21-.25$, $r=.19-.25$; see Hawker & Boulton, 2000 for a review).

Victimized children may interpret negative peer relations as critical appraisals of the self, potentially leading to internalized distress that shows as depression, low self-worth, and loneliness (Masten, 2005; Prinstein et al., 2001). Victims may also have relationship issues, emotional problems, and lower self-esteem (Wolke et al., 2000). Furthermore, bullied victims may have externalized and undercontrolled behavior problems which may reflect defensive “acting out” or acting in ways that divert peers’ attention from their physical appearance; additionally, externalized behavior problems may be overt manifestations of depressive symptoms and anxiety linked to negative peer relationships (Storch et al., 2007).

For example, a recent 2000 study of 1655 Korean seventh and eighth graders showed that social problems increased the risk of being a victim or a perpetrator of peer victimization (Kim, Bennett, Leventhal, Koh, Hubbard, & Boyce, 2006). Ten months later in 2001, the sample was revisited, and victims that were previously at a baseline showed increases in social problems, perpetrators showed an increase in aggression, and those who were both victims and perpetrators showed an increase in aggression and externalizing problems (Kim et al., 2006).

Risk Factors for Being Bullied or Becoming a Bully

As the psychological distress correlated with peer victimization becomes better understood, research has shifted to the risk factors that increase the likelihood of a child or adolescent being bullied or becoming a bully. For example, a recent study showed that children

and adolescents with autism had a high prevalence of bullying behaviors (Montes & Halterman, 2007). Furthermore, parental reports of Attention-Deficient/Hyperactivity Disorder symptoms seemed to moderate the relationship between bullying and autism; additionally, children and adolescents with both autism and ADHD symptoms had increased rates for bullying behaviors (Montes & Halterman, 2006).

Peer Victimization Risk Factors for Bullied Youth—Psychiatric Disorders

Multiple factors have been explored with this in mind, including psychiatric diagnoses, medical illnesses, and appearance related conditions. With regards to psychiatric diagnoses, compulsions and obsessions were positively and significantly related to peer victimization for children with obsessive-compulsive disorder (OCD: Storch et al., 2006b). For example, children that had more severe OCD symptomology also had increased reports of peer victimization. (Storch et al., 2006b). Peer victimization reports positively correlated with reports of depressive symptoms and loneliness, as well as parental reports of child externalizing and internalizing behaviors (Storch et al., 2006b). Little (2001) found that in a sample of 411 children and adolescents with Asperger's or nonverbal learning disorders, 73% had been hit by peers or siblings, 75% had been bullied, 10% were assaulted by a gang, 15% were victims of nonsexual genital assaults, and 33% experienced peer shunning.

Peer Victimization Health-Related Risk Factors for Bullied Youth

Furthermore, those who do not have psychiatric diagnoses, medical illnesses, and/or appearance related conditions may still have an increased risk for developing health-related symptomology. In a 2006 study, 1118 children aged 9-11 years from the Netherlands participated in a cohort study examining the relationship between peer victimization and health-related symptoms (Fekkes, Pijpers, Fredriks, Vogels, & Verloove-Vanhorick, 2006). At the beginning of the school year, 14.6% of the children were bullied and at the end of the school year, 17.2% of

the children were being bullied; children who were bullied at the beginning of the school year showed a significant higher risk of developing new health symptoms during the course of the school year including depression, anxiety, bedwetting, abdominal pain, and feeling tense (Fekkes et al., 2006). Children who were depressed and anxious at the beginning of the school year had increased risk of becoming victims later in the school year—depression and anxiety-related behaviors (submissiveness, non-assertiveness, not standing up for self) may increase vulnerability to being peer victimized (Fekkes et al., 2006).

Peer Victimization Risk Factors for Bullied Youth—Medical Conditions

Unfortunately, there is still limited research in what factors contribute to victimization, especially in regards to victims with medical conditions. Children and adolescents with medical conditions are frequent victims of peer victimization due to overt characteristics bullies may target (Storch et al., 2004a). For example, some children with endocrine disorders have physical differences (i.e., delayed puberty, short stature) that bullies may target for their attacks (Storch et al., 2004a). One of the most studied pediatric groups is children with Type 1 diabetes. Children and adolescents with Type 1 diabetes have observable self-care diabetes tasks (i.e., blood glucose checks, injecting insulin, dietary constraints) and equipment (i.e., insulin pumps, glucose watches, medical alert bracelets) that may cause negative attitudes held by bullies to arise (Storch et al., 2004b). These negative attitudes perpetuate the belief children and adolescents with diabetes are “different” and have special needs—these labels and overt differences may be used by bullies to fuel their aggression (Storch et al., 2004b). In a previous study, 55% of recently diagnosed diabetic children reported that they did not self-disclose information regarding their illness while 35% believed they would be better liked if they did not have diabetes (Jacobsen et al. 1986).

Storch et al. (2004b) found diabetic children to experience higher levels of relational aggression and receive fewer prosocial interactions than children without medical disorders. Relational aggression was positively correlated with depressive symptoms, social anxiety, and loneliness (Storch et al., 2004b). This raises an important concern that diabetic children and adolescents may be non-adherent to necessary diabetes-related tasks in order to avoid further victimization and isolation (Storch et al., 2004b). For example, peer victimized children with Type 1 diabetes that are bullied for their medical condition may avoid self-management behaviors that are easily observable by their peers, a finding confirmed in a later study (Storch et al., 2006a). Diabetes-related peer victimization was negatively related to overall diabetes self-management and more specifically to glucose testing and dietary tasks (Storch et al., 2006a). Negative stereotypes regarding endocrine-related short stature can be a potential source of psychosocial stress for the child and the child's family (Sandberg, 1999).

In retrospective studies, adults with stuttering difficulties (Hugh-Jones & Smith, 1999) and epilepsy (Wilde & Haslan, 1996) also reported high levels of peer victimization in childhood and adolescence. It appears as if victimized children internalize negative peer appraisals and evaluations, causing psychological distress to mount, affecting the child's or adolescent's desire to interact in situations that may be high-risk for peer victimization (Storch et al., 2004a, b). This limits victims' abilities to form positive peer relationships that could potentially provide protection or assistance in coping when assaults occur (Storch et al., 2004a).

Adjustment difficulties are one of the primary reasons for treatment non-adherence (Storch et al., 2004a). Children and adolescents may also miss important opportunities to have age-appropriate social and academic connections with peers; these interactions assist in the development of social skills that could reduce future acts of peer victimization (Storch et al.,

2004a, b). For example, self-management tasks like adherence to diet regimens and blood glucose testing may be at particular risk for being avoided due to the independent nature of the tasks and their overt nature (Storch et al., 2006a). Therefore, this study is important in determining potential barriers to treatment adherence for children who are overweight.

Peer Victimization Risk Factors for Bullied Youth—Appearance-Related Conditions

Childhood is characterized by physical changes occurring in puberty, so physical characteristics are often a frequent target for bullies (Janssen, Craig, Boyce, & Pickett, 2004). Physical appearances influence reactions from others, especially in a culture with a high standard of beauty (Janssen et al., 2004). Children and adolescents are the fastest growing segment in the obese population and have elevated rates of peer victimization due to perpetrators targeting physical differences of obese youth (Janssen et al., 2004). Besides numerous physical health concerns, there are many negative social and psychological ramifications for obese youth including being less liked by other peers, being rejected by peers, and being a frequent victim of peer victimization (Janssen et al., 2004).

Peer Victimization and Obesity

An expanding body of literature indicates obese youth experience frequent peer victimization that contributes to psychological distress and impaired psychosocial functioning and development (Eisenberg, Neumark-Sztainer, & Story, 2003). Furthermore, other findings indicate that obese youth are more likely to be peer victimized than peers in normal weight ranges (Janssen et al., 2004). Pearce, Boergers, and Prinstein (2002) found that a sample of 416 obese male and female high school students experienced higher levels of peer victimization and were less likely to date than their peers in normal weight ranges.

Storch et al. (2007) investigated the correlations between physical activity, peer victimization, and psychosocial adjustment in at-risk-for overweight and overweight youth. Child and adolescent participants (54 female, 38 male) completed measures on peer victimization, depression, anxiety, social physique anxiety, loneliness and physical activity while the parent/guardian completed the Child Behavior Checklist, which describes both internalizing and externalizing behaviors (Storch et al., 2007). Results showed peer victimization was positively correlated to youth's self-reports of depression symptoms, anxiety, social physique anxiety, loneliness and parental reports of internalizing and externalizing symptoms (Storch et al., 2007) Peer victimization was negatively related to physical activity; depressive symptoms and loneliness mediated the relationship between peer victimization and physical activity (Storch et al., 2007).

A longitudinal study performed in the United Kingdom provides additional information about social-psychological adjustment and obesity. A cohort of 2127 students from Glasgow were measured and surveyed at the ages of 11 years and 15 years (Sweeting, Wright, & Minnis, 2005). The study showed that at age 11 years, obese males reported lower moods and both obese males and obese females reported lower self-esteem (Sweeting et al., 2005). However, at the age of 15 years, the only gender differences were in female reports of self-esteem (which was still reported as being lower than the non-obese; Sweeting et al., 2005). Also, at age 11 years, obese males were less likely to report having lots of friends or having a girlfriend—for both genders, being obese doubled the odds of them being peer victimized (by age 15 years, the association between obesity and peer victimization was not found; Sweeting et al., 2005). At age 15, those who were no longer obese did not differ than from the continuously obese in regards to well-being, victimization, or dieting (Sweeting et al., 2005).

Peer Victimization, Obesity, and Eating Disorders

Previous research has identified peer victimization as one of the risk factors for body dissatisfaction and disordered eating (Eisenberg et al., 2003; Jackson et al., 2002). A study was performed with 32 women aged 19-43 years regarding their weight-based and physical appearance peer victimization histories, current eating patterns (including eating disorder features), body dissatisfaction, and psychological functioning (Jackson et al., 2002). Bulimia nervosa patients (those who eat large quantities of food and purge by vomiting, excessively exercising, or using laxatives or diuretics) reported higher levels of weight-based peer victimization and displayed greater dietary constraints than the other participants; additionally, peer victimization (both weight-based and physical appearance based) were not significantly associated with body dissatisfaction or eating disorder symptoms, but was related to psychological functioning (Jackson et al., 2002).

For binge-eating disordered patients (those who compulsively overeat or eat large quantities of food but do not purge) physical appearance based peer victimization was positively and significantly correlated with dietary restraint and depression (Jackson et al., 2002). Although higher levels of physical appearance based peer victimization was positively correlated with higher reported levels of low self-esteem and depression of patients with bulimia nervosa features, it was only correlated with higher reported levels of depression for patients with binge-eating disorder features (Jackson et al., 2002), Higher levels of weight based peer victimization was significantly correlated with lower self esteem for those with bulimia nervosa features but it was not correlated with psychological functioning for patients with binge-eating features (Jackson et al., 2002). It seems that different forms of peer victimization's influences on psychological functioning may vary depending upon the type of eating disorder (Jackson et al., 2002).

Peer Victimization and Obesity, Continued

Peer victimization, especially targeted on weight, is consistently associated with low body satisfaction, low self-esteem, suicidal ideation, and suicide attempts (Eisenberg et al., 2003). Furthermore, peer victimization among obese youth was positively correlated with elevated rates of emotional health problems, and suicidal ideation and attempts (which is 2-3 times higher among those who are victimized and those who are not; Eisenberg et al., 2003). Furthermore, it was the experience of being peer victimized and not the actual body shape of the child or adolescent that was positively correlated with poorer psychosocial outcomes (Eisenberg et al., 2003).

Peer victimization also hinders the social development of obese youth because children and adolescents depend on peers for social support, identity, and self-esteem (Janssen et al., 2004; Masten, 2005). Social problems are elevated in this population, and as is true for all youth, are predictive of short-term and long-term psychological outcomes (Janssen et al., 2004; Masten, 2005) For example, obese youth are less likely than non-obese youth to marry as adults; they also have lower household incomes and are less likely to complete school (obese girls; Janssen et al., 2004). One study showed that decreasing amounts of self-esteem in obese youth resulted in increased levels of loneliness, sadness, and nervousness; another finding has shown that obese youth have more depressive symptoms than average-weight youth and obesity in adolescence has an effect on high school performance (Janssen et al., 2004; Masten, 2005).

Childhood obesity is thought to lead to the development of low self-esteem and other psychosocial adjustment problems (Eisenberg et al., 2003); considering minority children are more likely to be obese they may also have greater risk to developing low self-esteem (Stern et al., 2007, Young-Hyman, et al., 2003). Furthermore, research has shown that perceived size was a better predictor of self-esteem than actual body weight and studies of the psychological impact

of childhood and adolescent peer victimization have focused on self-esteem, body esteem, and peer and parental teasing (Young-Hyman et al., 2003). Therefore, this research project makes an important contribution to the literature by examining how peer victimization affects children and adolescents on the social-psychological dimension. It also fills a void in the previous literature by examining how peer victimization correlates with physical activity in obese youth.

Current Research Project

The current study extends the work of Storch et al. (2007), which showed that peer victimization was negatively correlated with physical activity and positively correlated with self-reports of depressive symptoms, anxiety, loneliness, social physique anxiety, and parental reports of internalizing and externalizing behavior problems. Participants were 92 overweight children and adolescents aged 8-18 years and their parent or guardian attending a scheduled appointment at the University of Florida Pediatric Lipid Clinic; children and adolescents completed the Schwartz Peer Victimization Scale, the Children's Depression Inventory-Short Form, the Asher Loneliness Scale, the Multidimensional Anxiety Scale for Children, the Social Physique Anxiety Scale, and the PACE+ Adolescent Physical Activity Measure while their parent or guardian completed the Child Behavior Checklist (Storch et al., 2007). A modest and inverse relationship was revealed between reports of peer victimization and levels of physical activity; additionally, significant negative correlations were found between physical activity, loneliness, and depressive symptoms (Storch et al., 2007). Depressive symptoms and loneliness both mediated the relations between peer victimization and physical activity.

The current research project adds to this study in several ways. First, age and race will be tested as moderators of the relationship between peer victimization and physical activity. Second, a different and more comprehensive physical activity measure than the PACE+ will be used, in than in the Storch et al. (2007) study.

Based upon the literature, the current study focuses on addressing the empirical questions raised in previous studies. First, previous research relied heavily on parental report of child psychological functioning, which could account for higher reported impairment in obese youth, and/or underestimations of internalizing symptoms (Grills & Ollendick, 2002, 2003; Zeller, Saelens, Roehrig, Kirk, & Daniels, 2004). These relations may also be impacted by shared method variance. Second, there are few studies that have utilized psychometrically valid measures to directly link peer victimization to psychological distress. For example, although Neumark-Sztainer, Story, and Faibisch (1998) and Neumark-Sztainer, Falker, and Story (2002) provided rich qualitative data on the peer victimization experiences of obese youth, neither study used social-psychological measures that were psychometrically sound. Third, whereas the Storch et al. (2007) study provided valuable quantitative data on the relationships between peer victimization, psychosocial adjustment, and physical activity, a brief two-item self-report physical activity measure was utilized which may be limited due to not being able to provide information on the specific activities completed, when it was completed (i.e., after school, weekend), and specific amount of time of physical activity. Finally, both overt and relational forms of peer victimization will be utilized which is an advance over the past studies in the literature that have focused on overt aggression primarily.

Considering the negative psychosocial outcomes of peer victimization on obese youth, it is important to identify potential barriers to treatment adherence to provider recommendations (i.e., engaging in consistent physical activity). For example, there is evidence that obese youth may avoid participating in certain behaviors (e.g., physical education courses, sports) for fear of weight-based peer victimization. In a study of 576 middle school students, weight criticism during physical activity was associated with negative attitudes toward sports and reduced levels

of physical activity (Faith et al., 2002). Physical limitations caused by weight or symptoms associated with being obese may impact the ability to exercise. Additionally, if a child or adolescent's desire to exercise is compromised, it increases their risk to develop health problems (i.e., heart failure, diabetes). Furthermore, obese youth who are not intrinsically motivated to exercise may be non-adherent to exercise recommendations to assist them in losing weight, which decreases their likelihood for significant weight loss (Storch et al., 2007). By addressing peer victimization, it may assist healthcare providers in designing appropriate and useful interventions to assist obese youth in being physically active (Storch et al., 2007).

Based upon literature reviews and previous research, the following research aims and hypotheses for this study have been formulated:

Aim 1. To examine the relationship between peer victimization and physical activity.

Hypothesis 1: Peer victimization will negatively correlate with physical activity.

Aim 2. To examine the relationship between peer victimization and social-psychological adjustment indices. Hypothesis 2: Peer victimization will positively correlate with child-rated indexes of depression, general anxiety, and loneliness, and parent-rated indexes of internalizing and externalizing behavioral problems.

Aim 3. To examine the relationships between peer victimization, physical activity, and age. Hypothesis 3: The relationship between peer victimization and physical activity will be moderated by age.

Aim 4. To examine the relationships between peer victimization, physical activity, and race. Hypothesis 4: The relationship between peer victimization and physical activity will be moderated by race.

Aim 5. To examine the relationships between peer victimization, physical activity, and social-psychological adjustment. Hypothesis 5: The relationship between peer victimization and physical activity will be mediated by social-psychological adjustment.

CHAPTER 3 METHODS

Participants

Participants in the current study were 64 children and adolescents ages 8-18 years and their parent/guardian. Participants attended a scheduled appointment at the University of Florida Pediatric Lipid Clinic. This clinic is a multidisciplinary clinic that serves children and adolescents with lipid problems. It is staffed by a clinical psychologist, a nutritionist, and a medical doctor. Children and adolescents diagnosed by the attending clinical psychologist with mental retardation, a psychotic disorder, or who were unable to read the questionnaire packets, were excluded from participation. The sample of 64 children and adolescents consisted of 38 females and 24 males (missing data from 2 subjects) with a mean age of 13.4 years ($SD = 2.6$). Approximately half of the children and adolescents self-identified as Caucasian (45.3%), followed by African-American (39.1%), Hispanic (4.7%), and “other ethnicity” (4.7%).

Procedure

The University of Florida Institutional Review Board has approved this study. After it was determined the child or adolescent met the criteria for the study, the PI or a trained research assistant, asked the family if they would like to participate. If the family refused to participate, they still received the standard of care provided by the Pediatric Lipid Clinic. This standard of care includes obesity information, diet and exercise information, medical treatment, and psychological consultation during their scheduled appointment.

If the family was interested in participating, the parent or guardian was asked to read and sign a consent form and the child or adolescent was asked to provide written assent. After consent and assent were received, the parent or guardian was asked to complete the demographic form and the Child Behavior Checklist. The child or adolescent was asked to complete the Child

Depression Inventory—Short Form, the Multidimensional Anxiety Scale for Children, the Asher Loneliness Scale, the SPARK Physical Activity Measure, and the Schwartz Peer Victimization Scale. Both the parent and child or adolescent received instructions on how to complete the questionnaires, and the principal investigator (PI) or trained research assistant remained available to answer any questions. The parent or guardian was informed their participation would take approximately 20 minutes and the child or adolescent was informed their participation would take approximately 35 minutes. Parents and their children or adolescents were notified that they were still receiving their regular standard of care. After the completion of the questionnaires, participants were thanked for their time.

HIPAA

Due to the fact that participants will reveal healthcare information, the PI, other researchers, and all research assistants completed the University of Florida’s “HIPAA 102 General Knowledge (or Annual Review) Test of Knowledge.” The test is a requirement for all students, staff, and faculty persons that have access to healthcare data. The test includes information regarding regulations and penalties regarding obtaining, maintaining, protection, removal, and storage of all healthcare data.

After participants’ questionnaires were collected, the physical questionnaires were stored in the supervisor’s lab, in locked storage cabinets, at the Department of Psychiatry. Data from the questionnaires will be stored in computers with secure passwords. Only the PI, her direct supervisor, research assistants, and the UF IRB will have access to the collected data. Names were deleted from the collected information and replaced with a numerical identification number. Only the PI has a master list of names and identification numbers. The physical questionnaires will be kept for five years—after the elapsed time all records will be destroyed.

Measures

Child Measures

Schwartz Peer Victimization and Aggression Scale (Schwartz, Farver, Change, & Lee-Shin, 2002). This 5-item scale assesses overt and relational forms of peer victimization and aggression among children and adolescents that occurred over the past two weeks. Items are consistent with contemporary definitions of peer victimization which include both overt and relational forms of bullying behaviors (Crick & Grotpeter, 1996). For example, one item reads, “How often do other kids make fun of you?” The items are rated on a 4-point scale ranging from (“never”) to (“almost every day”). This measure has a good internal consistency (Cronbach’s alpha of .75), a stable one-factor structure, and correlated modestly and positively with teacher and peer reports of peer victimization (Schwartz, Farver, Change, & Lee-Shin, 2002). Cronbach’s alpha for this study was .89.

Children’s Depression Inventory—Short Form (Kovacs, 1992). This commonly used 10-item version of the CDI assesses depressive symptomology over the past two weeks for school-aged children and adolescents (Kovacs & Beck, 1977). There are 10 items that ask a child or adolescent to assess statements that best describe cognitive, affective, or behavioral symptoms of depression. The CDI has a 3-point scale indicating the absence or presence of mild or definite symptoms, with the child or adolescent choosing the one that is the best fit. An example of this would be (“I am sad once in a while.”), (“I am sad many times.”), (“I am sad all the time.”). The literature supports good reliability with various samples, with a Cronbach’s alpha ranging from .71 - .89, and test-retest coefficients ranging from .74-.83. Additionally, there has been strong support for the construct validity of the CDI (Craighead, Smucker, Craighead, & Illardi, 1998; Kovacs, 1992). Cronbach’s alpha for this study was .83.

The Multidimensional Anxiety Scale for Children (March, Parker, Sullivan, Stallings, & Conners, 1997). The MASC is a 39-item self-report questionnaire that assesses symptoms of general, social, and separation anxiety in children and adolescents. The items are rated on a 4-point Likert scale ranging from 0 (“never”) to 3 (“always”). An example of an item is, “I feel tense or uptight.” Higher scores reflect higher levels of anxiety, with the total score being computed by summing all items. The MASC has excellent internal consistency with a Cronbach alpha of .90 (March et al., 1997). Three week and three month test-retest reliability has been shown to be .88 and .87, respectively (March, et al., 1997; March, Sullivan, & Parker, 1999). The MASC correlates modestly with the Revised Children’s Manifest Anxiety Scale (RCMAS; $r = .63$) and weakly with the CDI ($r = .19$) and the Abbreviated Symptom Questionnaire (ASQ; $r = .07$). Cronbach’s alpha for this study was .88.

Asher Loneliness Scale (Asher & Wheeler, 1985). The ALS is a 24-item scale that assesses self-reported loneliness in children and adolescents over the past two weeks (Asher, Hymel, & Renshaw, 1984). The ALS was modified to only include those items that focus on feelings of loneliness, social and subjective adequacy, and subjective estimations of peer status. The items are rated on a 5-point scale ranging from 1 (“not true about me at all”) to 5 (“always true about me”). The ALS has good psychometric properties including, good internal consistency (alpha = .91), a stable factor structure, and high convergent validity (Asher & Wheeler, 1995; Bagner, Storch, & Roberti, 2004). Cronbach’s alpha for this study was .89.

SPARK Physical Activity Measure (Sallis et al., 1993). This is a 21-item self-report measure that examines physical activity in youth. The child or adolescent reflects on a list of physical activities and then writes how often they were done in the last week, for at least 15 minutes, between a) Monday-Friday and b) the weekend. A metabolic equivalent score is used to

group the list of activities by their levels of intensity (Sallis et al., 1993). Light activities (e.g., walking, four square, gymnastics) were scored 3 METS; medium activities (e.g., dancing, hiking/climbing, basketball) were scored 5 METS; and hard activities (e.g., jumping ropes, jumping jacks, running/jogging) were scored 9 METS (Sallis et al., 1993). Multiplying the frequencies of each activity by the appropriate MET value and summing the products will total the final score.

The SPARK was chosen over existing measures because it provides more comprehensive data on when the physical activity occurred (weekday, weekend) and the type of physical activity completed. Furthermore, it is important to note only activities completed before or after school count; engaging in physical activity outside of school displays more volition by the child or adolescent (Sallis et al., 1993). Cronbach's alpha for this study was .92.

Parent/Guardian Measures

Demographic Form. The demographic form asks demographic information about the family including race, family status, and parents' level of education.

Child Behavior Checklist (Achenbach, 1991). The CBCL is a widely used 113-item parent-rated scale that assesses the chores, hobbies, activities, and internalizing and externalizing symptoms of children and adolescents over the past 6 months. The CBCL is rated on a 3-point scale ranging from 0 ("never") to 2 ("often or always"). Eight subscales are derived, including Withdrawal/Depression (Cronbach's alpha for this study was .83), Somatic Symptoms (.79), Anxiety/Depression (.87), Social Problems (.72), Attention Problems (.86), Rule Breaking Behavior (.74), Aggression (.89). Cronbach's α for the Internalizing and Externalizing Scales were .92 and .94. Cronbach's alpha was .90 for the Externalizing scale and .92 for the Internalizing scale.

Data Analysis

First, to examine correlations among peer victimization, social-psychological adjustment, and physical activity, Pearson product moment correlations will be computed. Pearson-product moment correlations were calculated to assess the relationships between peer victimization, depression, general anxiety, and loneliness. Considering that the current sample was modest in size, correlations between .1-2.9 were considered to be of small effect sizes, correlations between .3-.49 were considered to be of medium effect sizes and correlations above 0.5 were considered to be of a large effect size (Cohen, 1977). Given the modest sample size and preliminary nature of this study, corrections for Type I error were not made for these or subsequent analyses.

Second, one mediational and two moderator models will be tested to ascertain if the relationship between peer victimization and physical activity is moderated by age or race or mediated by social-psychological adjustment indices. Baron and Kenny's (1986) guidelines for mediation will be followed to test the model for the influence of peer victimization on physical activity via social-psychological adjustment. The following criteria are necessary for mediation: (I) the predictor (peer victimization) is significantly associated with the outcome (physical activity); (II) the predictor is significantly associated with the mediator (social-psychological adjustment variables); (III) the mediator is associated with the outcome variable (with the predictor accounted for); and (IV) the addition of the mediator to the full model reduces the relation between the predictor and criterion variable.

The moderator variables (age and race) will be tested by using hierarchical regression analyses. For step one, either age or race will be added to the regression. For step two, the predictor variable will be added (peer victimization). In step three, age or race by the physical activity will determine the interaction between the two variables (age and physical activity, race and physical activity). Age was defined as children 8-12 years of age and adolescent 13-17 years

of age. The split was created to ascertain if there would be differences between younger children and older adolescents in regards to how peer victimization is addressed. For example, are older adolescents better apt to manage peer victimization due to more experience in developing coping strategies? Race was defined by cultural/racial identification: Caucasian, African-American, Hispanic, and Other and for data analyses race was grouped into two categories (White and non-White). The White and non-White categories were determined to ascertain if there were differences between minority and non-minority youth based upon minorities being at higher risk to be obese at younger ages and continuously through adolescence than White populations (Young-Hyman et al., 2003).

Moderation Models

Table 3-1. The relationship between peer victimization and physical activity will be moderated by age

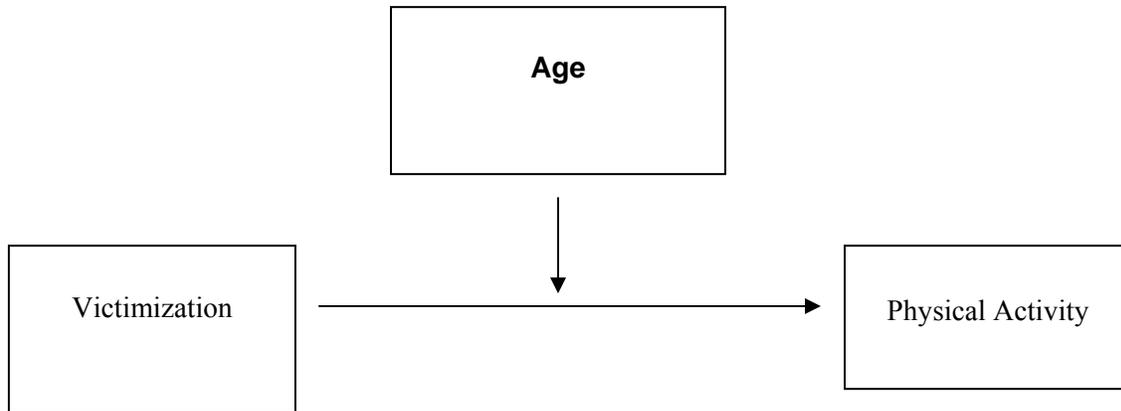
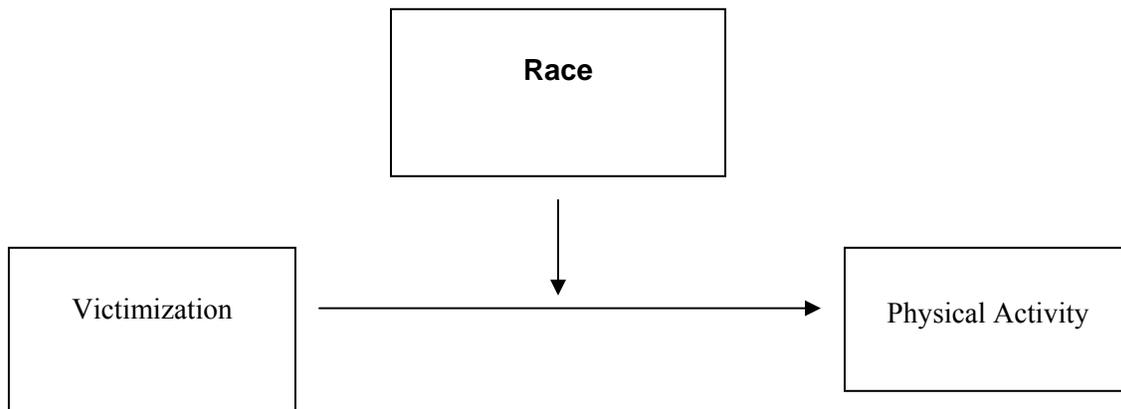
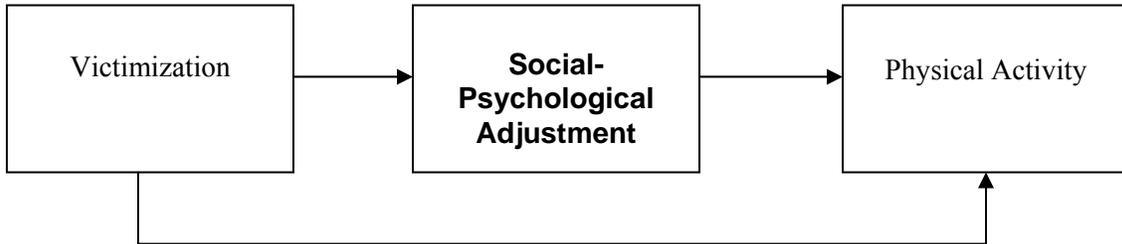


Table 3-2. The relationship between peer victimization and physical activity will be moderated by race



Mediation Model

Table 3-3. The relationship between peer victimization and physical activity will be mediated by social-psychological adjustment



CHAPTER 4 RESULTS

Descriptive Statistics

An independent samples *t*-test revealed a significant gender difference in children and adolescents' self-report of peer victimization, $t(1, 56) = 2.03, p = 0.048$. Females scored significantly higher ($M = 8.49, SD = 3.30$) in self-reports of peer victimization (than males ($M = 6.91, SD = 2.11$)). There was no significant difference found between age (child, aged 8-12 vs. adolescent, aged 13-17) among youth's self-report of peer victimization, $t(1, 54) = -.63, ns$. In regards to the other variables, 22.1% of children and adolescents scored 1 *SD* above the mean or higher on peer victimization, 18.9% on loneliness, 19.3% on depressive symptoms, and 15% on anxiety.

Data Analyses Results

Hypothesis 1: Peer victimization will negatively correlate with physical activity.

Pearson product moment correlation revealed no significant relationship between peer victimization and physical activity ($r = -.034, p > .05$).

Hypothesis 2: Peer victimization will positively correlate with child-rated indexes of depression, general anxiety, and loneliness, and parent-rated indexes of internalizing and externalizing behavioral problems.

Pearson product moment correlations were conducted between reports of peer victimization and both child and parent reports of social-psychological adjustment, which are presented in Table 4. Pearson product moment correlations revealed significant and positive correlations between child-rated indices of peer victimization and depressive symptoms [$r = 0.45, p = 0.001$], general anxiety symptoms [$r = 0.37, p = 0.007$], and loneliness [$r = 0.55, p < 0.001$]. Additionally, child-rated peer victimization was positively correlated with parent-rated

indexes of withdrawal behavior/depression $r = 0.33$ [$p = 0.012$] and social problems [$r = 0.44$, $p = 0.001$], but not with physical activity and parent-rated indexes of child internalizing behaviors (i.e., somatic symptoms, anxiety/depression, thought problems, attention problems) and externalizing behaviors (aggressive behavior, rule-breaking behavior).

Hypothesis 3: The relationship between peer victimization and physical activity will be moderated by age.

A hierarchical linear regression was conducted to investigate whether or not child age would be a moderator variable between peer victimization and physical activity. The child peer victimization scores and child age were the predictor variables and physical activity was the criterion variable. Per guidelines by Baron and Kenny (1986), the child age and peer victimization scores were entered together in step one, and then the interaction age and peer victimization were entered in step two.

Results revealed a main effect for age as a predictor of child-rated physical activity ($\beta = -.36$, $p = .021$), however, there was no significant main effect for peer victimization as a predictor physical activity ($\beta = -.12$, ns). There was no significant effect for the interaction of age by peer victimization [R^2 change = 0.008; $F(1, 38) = .56$, ns].

Hypothesis 4: The relationship between peer victimization and physical activity will be moderated by race.

A hierarchical linear regression was also conducted to investigate whether or not race would be a moderator variable between peer victimization and physical activity. The child peer victimization scores and ethnicity were the predictor variables. Ethnicity and peer victimization scores were entered together in step one, and the interaction of ethnicity and peer victimization were entered in step two.

In the analysis to determine whether ethnicity (e.g. minority vs. non-minority) and peer victimization interacted with physical activity, step one analyses revealed that ethnicity significantly predicted child-rated physical activity for Caucasians ($\beta = .58, p = .031$) and African-Americans ($\beta = .51, p = .020$), however, there were no significant effects for the interaction of ethnicity and child-rated physical activity for Hispanic ($\beta = .25, ns$), and Other ($\beta = .24, ns$). Additionally, there was no significant effect for the interaction of peer victimization and physical activity ($\beta = -.09, ns$). There was also a significant effect for the interaction of ethnicity by peer victimization [R^2 change = 0.100; $F(3, 34) = 3.61, p = .023$].

Hypothesis 5: The relationship between peer victimization and physical activity will mediated by social-psychological adjustment.

Per Baron and Kenny (1986), the following criteria were necessary for mediation: (I) the predictor (peer victimization) is significantly associated with the outcome (physical activity); (II) the predictor is significantly associated with the mediator (social-psychological adjustment variables); (III) the mediator is associated with the outcome variable (with the predictor accounted for); and (IV) the addition of the mediator to the full model reduces the relation between the predictor and criterion variable. These guidelines for mediation were not met to test the influence of peer victimization on physical activity via social-psychological adjustment due to the lack of a significant relationship between peer victimization and physical activity ($r = -.034, ns$).

Table 4-1. Fixed effects for the model testing the peer victimization as a predictor of child physical activity with age and ethnicity as moderators

Predictor Variable	B	SE	t
Ethnicity as Moderator			
Peer Victimization	-2.50	17.71	-.14
Ethnicity	.45	85.98	.01
Ethnicity * Peer Victimization	.86	10.93	.08
Age as Moderator			
Peer Victimization	10.20	24.42	.42
Age	-3.33	16.94	-.20
Age * Peer Victimization	-1.15	1.95	-.59

B = Unstandardized Regression Coefficient, SE = Standard Error, t = t-statistic.

The findings in the current study have to be interpreted with some caution due to the low sample size (N=42) making the power in the present study .57 in the regression analyses.

Table 4-2. Pearson correlation coefficients among study variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Peer Victimization	1.0													
(2) CDI	.45**	1.0												
(3) MASC	.37**	.39**	1.0											
(4) ALS	.55*	.50**	.38*	1.0										
(5) CBCL WD Scale	.33*	.34*	.39**	.46**	1.0									
(6) CBCL SPRB Scale	.44*	.25	.45**	.34*	.63**	1.0								
(7) CBCL SOM Scale	.14	.09	.27	.029	.37**	.27*	1.0							
(8) CBCL ANXD Scale	.14	-.00	.39*	.23	.66**	.63**	.638	1.0						
(9) CBCL TPRB Scale	.10	.10	.12	.29	.44**	.39**	.32*	.58**	1.0					
(10) CBCL ATT Scale	.22	.16	.23	.30*	.63**	.73**	.24	.67**	.74**	1.0				
(11) CBCL DEL Scale	.22	.09	.21	.34*	.46**	.58**	.21	.57**	.42**	.73**	1.0			
(12) CBCL AGGR Scale	.21	.23	.39**	.29	.44**	.71**	.43**	.69**	.59**	.84**	.66**	1.0		
(13) CBCL INT Scale	.29	.19	.41*	.59**	.88**	.64**	.71**	.90**	.56**	.69**	.59**	.62**	1.0	
(14) SPARK	-.03	.13	.00	-.10	.00	-.12	-.23	-.16	.15	-.03	-.25	-.09	-.16	1.0
Mean (Standard deviation)	7.9 (2.9)	13.1 (3.4)	35.0 (14.4)	29.7 (12.1)	3.6 (3.5)	4.2 (3.4)	3.3 (2.7)	3.5 (3.5)	.888 (1.1)	4.1 (4.2)	1.9 (2.1)	7.5 (6.3)	10.7 (8.8)	104.8 (89.3)

Note: *PVS*=Peer Victimization Scale; *CDI* = Children's Depression Inventory; *MASC* = Manifest Anxiety Scale for Children; *ALS* = Asher Loneliness Scale; *CBCL* = Child Behavior Checklist; *SPARK*=Weekly Physical Activity Measure

* $p < .05$, ** $p < .01$

Table 4-3. Pearson correlation coefficients among study variables for boys and girls separately

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	Boys Mean(SD)
(1) Peer Victimization	1.0	.58**	.37	.35	.50*	.38	-.03	.25	.55*	.42*	.32	.41	.22	.36	6.9(2.1)
(2) CDI	.43*	1.0	.37	.55*	.52*	.19	-.18	-.13	.25	.18	-.08	.20	.35	-.03	13(3.1)
(3) MASC	.32	.42*	1.0	.29	.57**	.40	.33	.46*	.46*	.51*	.21	.48*	.59*	.11	30(14)
(4) ALS	.63**	.48*	.41	1.0	.28	.19	-.10	.11	.37	.12	.06	.24	.32	-.10	27.4(11.1)
(5) CBCL WD Scale	.28	.26	.28	.61**	1.0	.67**	.22	.69**	.56**	.74**	.43	.59**	.83**	.26	3.3(4.0)
(6) CBCL SPRB Scale	.52**	.34	.51**	.51*	.60**	1.0	.66	.57**	.74**	.85**	.78**	.73**	.46	.13	4.1(3.1)
(7) CBCL SOM Scale	.13	.19	.17	.05	.45**	.40*	1.0	.74**	.53**	.48*	.34	.68**	.83**	.08	2.8(3.2)
(8) CBCL ANXD Scale	.04	-.07	.27	.40	.64**	.66**	.55**	1.0	.53*	.48*	.34	.89**	.94**	-.11	2.8(3.2)
(9) CBCL TPRB Scale	-.10	.02	-.08	.18	.33	.06	.18	.43*	1.0	.76**	.72**	.92**	.69**	.16	1.0(1.2)
(10) CBCL ATT Scale	.24	.20	.06	.68**	.55**	.59**	.11	.70**	.60**	1.0	.82**	.90**	.83**	.15	5.1(5.2)
(11) CBCL DEL Scale	.18	.17	.19	.51*	.49**	.45*	.15	.60**	.10	.75**	1.0	.78**	.50*	.06	1.8(2.1)
(12) CBCL AGGR Scale	.15	.27	.15	.41*	.30	.72**	.32	.57**	.20	.73**	.60**	1.0	.83**	.09	8.1(7.7)
(13) CBCL INT Scale	.27	.11	.27	.75**	.90**	.74**	.65**	.88**	.43*	.72**	.67**	.56**	1.0	-.02	8.6(8.2)
(14) SPARK	-.24	.17	-.08	-.10	-.18	-.41*	-.40*	-.25	.16	-.30	-.45*	-.25	-.28	1.0	99.6(78.2)
Mean	8.5	13.2	38.2	31.8	3.7	4.3	3.7	4.1	0.9	3.4	2.0	7.1	12.1	108.5	
(SD)	(3.3)	(3.7)	(14.3)	(12.8)	(3.3)	(2.6)	(2.8)	(3.7)	(1.0)	(3.3)	(2.1)	(5.4)	(9.0)	(97.7)	
Girls															

Note: PVS=Peer Victimization Scale; CDI = Children's Depression Inventory; MASC = Manifest Anxiety Scale for Children; ALS = Asher Loneliness Scale;

CBCL = Child Behavior Checklist; SPARK=Weekly Physical Activity Measure

* p < .05, ** p < .01 (Pearson correlations for girls are below the mid-line and boys are above the mid-line).

CHAPTER 5 DISCUSSION

The current study investigated the relationships between peer victimization, physical activity, and social-psychological adjustment in obese youth. Although the study was correlational and does not provide causal information regarding the relationships between the variables, it does provide supporting evidence to the existent literature reflecting the damage peer victimization has on with obese youth. Overall, peer victimization was significantly and positively correlated with child and adolescent reports of depressive symptoms, general anxiety symptoms, and loneliness. Additionally, peer victimization was also significantly and positively correlated with parental reports of withdrawal/depressive symptoms and social problems.

Descriptives

Females scored significantly higher in self-report of peer victimization than males. There was no significant difference found between age (child vs. adolescent) in self-reports of peer victimization. In regards to the other variables, less than 20% of the sample reported being peer victimized and experiencing symptoms of depression, anxiety, and loneliness. Further discussion and examination of results, clinical implications, and limitations are to follow.

Hypotheses

The first research aim of the study was to examine the relationship between peer victimization and physical activity. It was predicted that peer victimization would negatively correlate with physical activity. The current study did not reveal a significant relationship between peer victimization and physical activity, which has been shown in a prior study (Storch et al., 2007). This surprising finding raises the question of what differences existed between this study and that of Storch et al. (2007). One contributing factor to the difference in results may be attributed to the use of a different physical activity measure. In Storch et al. (2007), the two-item

PACE measure was utilized. The PACE asks youth to report how many days they have been physical active for at least 60 minutes in the prior week (Prochaska, Sallis, & Long, 2001). The SPARK physical activity measure used in the current study is a relatively new measure and has not demonstrated strong stability and convergent validity with other physical activity measures as with the PACE. For example, the PACE+ has demonstrated stability (intraclass correlation coefficient = .77) and convergent validity with other measures of physical activity (Prochaska, Sallis, & Long, 2001). The SPARK had low validity (.47) with an objective measure of physical activity, the Caltrac accelerometer, which is an electronic assessment tool that measures both the quantity and intensity of movement. (Sallis et al., 1993). Furthermore, Sallis et al. (1993) reported that caution should be used when interpreting SPARK data due to the low validity and the self-report nature of the SPARK which calls for subjects to have the ability to recall variable physical activities which may be a difficult cognitive task for youth..

The SPARK's utilization in the current study was based upon its ability to provide more detailed accounts of when physical activity occurred (weekdays and weekends) and provided more details on the type of physical activity completed (i.e., running, jumping rope, playing basketball). Whereas the SPARK does provide more comprehensive information on physical activity than the PACE, it may have been too overwhelming or complex for participants to complete, particularly in the time constraints of their appointment. Considering the differential results regarding the relationship between peer victimization and physical activity, future research should focus on pilot testing physical activity measures in order to assess which one would be most appropriate for the sample.

There is also a possibility that peer victimization does not impact physical activity in the same manner (or at all) for obese youth. For example, obese youth may elect to participate in

physical activities despite the possibility of being peer victimized. Parents may be able to override children or adolescents fears of being victimized by offering incentives, assisting them with the development of anti-bullying strategies, or offering to speak with school officials. Additionally, with an increase in technology, children and adolescent television programming, and computer and video games, obese youth may prefer sedentary activities over physical ones.

The second research aim of the study was to examine the relationships between peer victimization and social-psychological adjustment reports by children, adolescents, and parents. It was predicted that peer victimization would positively correlate with child-rated indices of depressive symptoms, generally anxiety, and loneliness, and parent-rated indices of internalizing and externalizing behavior. As previous studies have shown (see Hawker & Boulton, 2000 for a review), peer victimization was positively associated with depressive symptoms, anxiety, and loneliness, which provides further support of the distressing and problematic aspects of peer victimization. These findings may reflect not only the damaging effects of peer victimization, but also that frequently peer victimized children and adolescents may internalize the content of peer attacks, thus impacting important social-psychological development (Storch et al., 2007). For example, a child who is victimized and frequently belittled may believe attackers' comments, which could potentially reduce their confidence and compromise their ability to approach or befriend others. Obese and victimized youth often lack opportunities to develop positive peer relationships in childhood and adolescence, which is crucial task in successful social-psychological development (Stern et al., 2007).

Obese youth who are victimized may be at particular risk for poorer psychosocial outcomes due to childhood and adolescence being an important time period for physical changes and self-awareness of physical changes (Janssen et al., 2004). Furthermore, the association of

peer victimization and low self-esteem of obese children and adolescents is persistent in the literature due to bullying negatively affecting quality of life issues (Stern et al., 2007; Storch et al., 2006). Additionally, significant implications exist for children and adolescents who have medical conditions (i.e., obesity, endocrine disorders) including suicidal ideation, suicide attempts, and non-adherence to important self-management of potentially life threatening diseases (Eisenberg et al., 2003; Storch et al., 2006).

The third and fourth research aims of the study were to examine age and race as moderators of the relationship between peer victimization and physical activity. Age was chosen as a moderator variable to investigate potential differences between children (aged 8-12-years) and adolescents (aged 13-17-years) in levels of peer victimization and physical activity. Considering that minority children and adolescents are at greater risk of becoming obese than non-minority children and adolescents (Young-Hyman, et al., 2003) race was chosen as a moderator variable to determine if there are other potential differences. It was predicted that both age and race would moderate the relationship between peer victimization and physical activity.

However, the current study did not find significant results for peer victimization and physical activity being moderated by age or race. This finding is similar to the results of Stern et al. (2007) who found few race differences on psychosocial variables; therefore, it seems that children and adolescents, regardless of race, may be equally vulnerable to peer victimization. However, it would be important to ascertain if other cultural factors or aspects of identity play a role in the relationship between peer victimization and physical activity and provide more data on the relationship between race, peer victimization, and social-psychological outcomes.

The final research aim was to examine the relationship between peer victimization, physical activity, and social-psychological adjustment. It was predicted that the relationship

between peer victimization and physical activity would be mediated by social-psychological adjustment. Inconsistent with expectations, results did not support social-psychological adjustment as a mediator of peer victimization and physical activity. Although the current study did not find the relationship between peer victimization and physical activity being mediated by social-psychological adjustment, one other study has demonstrated supporting evidence for mediation (Storch et al., 2007). Non-significant findings may also be attributed to familial relationships providing additional protective factors. For example, parents may be able to provide support and unconditional positive regard that assists children and adolescents in addressing peer victimization, participate in physical activities and navigate social-psychological adjustment positively than their counterparts who lack strong family bonds.

Clinical Implications

Considering the strong evidence that supports peer victimization as being significantly associated with poorer social-psychological outcomes (Hawker & Boulton, 2000; Storch et al., 2007), these findings have several clinical implications. First, it may be beneficial for healthcare providers treating obese youth to discuss peer victimization and problem-solve ways to develop counter-bullying strategies. For example, healthcare providers can consult with school officials and parents in order to raise the level of awareness of the problem of peer victimization. Motivational strategies, like empowerment workshops, unconditional positive regard, incentives, anti-bullying information, and continuous support, may also help victims confront challenging situations (Faith et al., 2002).

Children and adolescents who express depressive symptoms, anxiety, loneliness, withdrawal behaviors, and social problems at clinic appointments need to be assessed and subsequently, may need psychotherapeutic or psychotropic interventions. Cognitive-behavioral treatment and psychotropic medications (i.e., Lexapro, Paxil, Zoloft) for depression and anxiety

have been empirically-supported as appropriate and successful measures (Messer, 2004). Therefore, treatment of symptoms associated with peer victimization via psychological and/or psychiatric intervention is important. It would also prove beneficial to teach social skills to children and adolescent (i.e., assertiveness, conflict management).

An example of such a bullying intervention was completed with 40 girls that were identified as peer victimizers; they were randomly recruited to participate in brief strategic family therapy (BSFT) for three months with a follow-up occurring 12 months after treatment (Nickel et al., 2006). It was revealed that girls who participated in BSFT (in comparison to the control group) not only showed reduction in bullying behaviors there were also statistically significant reductions in all risk-taking behaviors including aggression, anger, interpersonal conflict, and health-related problems (i.e., smoking cigarettes; Nickel et al., 2006). Findings suggested that those exhibiting bullying behaviors also suffer from psychological and social problems that may be remedied or reduced with therapeutic intervention (Nickel et al., 2006).

Due to the negative outcomes associated with peer victimization, it is important for schools to establish and maintain programs that effectively address the problem of peer victimization including, but not limited to, development of stricter penalties for aggressors, reduction of opportunities for bullying, and meetings with parents (Eisenberg & Aalsma, 2004). Furthermore, it would be beneficial to have school staff trained in being able to identify bullying behaviors. For example, school officials and staff should be trained to identify perpetrators and peer victimization (both overt and relational forms). Also, more supportive programming and policies that celebrated size diversity, consulted with healthcare professionals and providers, provided equality of opportunity in school events and activities, educated parents on the consequences of

peer victimization, and developed a no-tolerance policy on bullying that was closely monitored and enforced would be helpful in creating a better climate for all students.

For example, peer victimized children and adolescents are often fearful that reporting bullying behaviors will have even more disastrous outcomes, like not resolving the problem, retribution, or an exacerbation of the situation (Newman & Murray, 2005). Furthermore, anti-bullying programs have not only been shown efficacious, but also distribute more of the responsibility to end peer victimization on all involved parties, not just the victim (Frey et al., 2005). In a previous study (Frey et al., 2005), six schools were randomly assigned to an anti-bullying program called “Steps to Respect;” results revealed that students in the intervention group reported increases in agreeable interactions, an increase in bystander responsibility, greater perceived adult responsiveness, and less aggression or bullying than the control group.

Future research should focus on identifying moderators and mediators between the relationships of peer victimization, physical activity, and social-psychological adjustment to continually provide data for the existence or non-existence of these relationships, to evaluate if these relationships are constant over time (longitudinal studies), and how peer victimization may influence adulthood adjustment and psychological functioning . Several potential variables that should be explored include family variables, socio-economic status, treatment seeking vs. non-treatment seeking populations, and access to healthcare.

Limitations

Limitations of the current study should be considered. First, the correlational nature of the study does not provide causal data or directionality of the relationships. Therefore, it is difficult to ascertain how these relationships are established and maintained. Second, this study depends on accurate self-report by youth and their parents, which may not capture the relationships between peer victimization, physically activity, and social-psychological adjustment in its

entirety. For example, self-report measures are vulnerable to potential confounds of response bias (Storch et al., 2007). Additionally, considering the variable nature of physical activity (e.g., changes daily) and the need to recall physical activity, objective measures of physical activity may be beneficial in future research. Additionally, children, adolescents, and parents may provide socially desirable responses or underreport symptomology for fear of negative consequences or being negatively judged by others.

Third, all of the children and adolescents who participated in the study were seeking medical treatment at a lipid clinic, which in and of itself may play a factor in the relationships between these variables. For example, results may not generalize to non-seeking treatment obese youth due to additional variables and difference between those who seek and do not seek treatment (that may be related to socio-economical status, the ability to pay for healthcare). For example, a prior study showed smaller quality of life issues among non-seeking treatment youth (Williams, Wake, Hesketh, Maher, Wats, E, 2005). Therefore, future research should focus on studying both clinical and non-clinical obese youth to ascertain if differences exist between the two populations.

Fourth, the SPARK's less strong validity properties could have negatively impacted results. Therefore, not including the PACE+ as one of the measures is an additional limitation. Fifth, the study does not take into account obese youth that have physical limitations that may prevent or limit their ability to exercise and be physically active. Sixth, the timing of the study, could have impacted the results. The majority of data collection was completed during the summer in a tropical climate which could have impacted youth's ability or desire to participate in physical activity (especially physical activity that would occur outside). Seventh, body mass index was not collected, which could have potentially provided information regarding

differences between youth of varying weight. However, Storch et al. (2007) did not find significant differences between youth's weight which may reveal that regardless of the exact weight, youth that obese share similar experiences.

Summary

In summation, the current study provided supporting evidence for the interrelatedness of peer victimization and poorer social-psychological adjustment for obese children and adolescents. It also found that peer victimization is a common and frequent experience of obese youth. Based upon the findings, it proves critical for those involved in the education and treatment of obese youth to assess peer victimization and social-psychological adjustment and evaluate current physical and mental health status and needs.

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BIOGRAPHICAL SKETCH

Charisse Williams was born in Detroit, MI. After finishing high school, she attended the University of Michigan from 1995 to 1999, graduating with dual degrees in psychology and communications. Charisse entered the University of Florida in June 2001, after two years of working with at-risk youth, pregnant and parenting teenage mothers, and battered women. Charisse completed her Master of Science degree in 2005 and will complete her Ph.D. in Summer 2007. Charisse has also completed a one-year APA-approved, APPIC-registered internship at Arizona State University's Counseling and Consultation Center from 2006 to 2007. Charisse has recently accepted a staff position at the University of Washington in Seattle starting September 4, 2007.