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Effects of Juvenile Obesity on Self-efficacy: Implications for Academic Achievement

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In 1998, The World Health Organization designated obesity as a global epidemic (Edmunds, Waters, & Elliot, 2001). Similarly, an alarming increase of obesity in juvenile populations has been noted in the past several years (Myers & Vargas, 2000), and the media has heralded the many health issues created by this growing problem. While the physical well being of overweight children is deserving of increased attention, the psychosocial development of obese youngsters may be equally as important. Links between low self-esteem and self-efficacy in childhood and adolescence point to an increased likelihood of depressive behaviors that may persist well into adulthood (Bandura, Pastorelli, Barbaranelli, & Caprara, 1999; Corbin, Corbin, & Pangrazi, 1997). Depressive behaviors have in turn been linked to detrimental effects on academic achievement in juvenile populations (Corbin et al., 1997; Galanaki & Kalantzi-Azizi, 1999). The problem that this researcher will address, then, is whether juvenile obesity does indeed lead to decreased academic achievement. If a link is found, then means of aiding this population of at-risk children will need to be addressed.

Many of the terms used in relation to both weight and age in studies of juvenile obesity are used synonymously. For the purposes of this investigation, the following differentiation between terms will apply:

1. The terms *juvenile*, *child*, *student*, *youngster*, *boy*, and *girl* will be employed in a general sense to encompass individuals under the age of 18.
2. The term *adolescent* will be employed to encompass all individuals from age 12 to age 18.

3. The terms *overweight*, *obese*, and *fat* will be employed synonymously to indicate Centers for Disease Control weight measures of 20% over the recommended BMI for juveniles (Centers for Disease Control, n.d.).

Previous research into the psychosocial effects of juvenile obesity has focused primarily on issues related to body image and self-esteem. Fox and Edmunds (2000) found that overweight children have an increased risk for psychological problems and are more likely to be isolated, rejected, and ostracized. Harassment and prejudicial treatment of children based on weight and appearance have also been shown to negatively affect a child's perception of his or her cognitive ability (Davison & Birch, 2001).

Bandura, Barbaranelli, Caprara, and Pastorelli (2001) determined that a child's academic self-efficacy influences the type of occupational activities he or she deems feasible, suggesting that it is the child's perceived self-efficacy--rather than actual academic capability--which directs occupational and academic goals. Bandura and his fellow researchers theorized that perceived low academic self-efficacy leads to depression both directly and indirectly through its effects on pro-social interaction and engagement in problem behaviors (Bandura et al., 1999).

Considering the negative perceptions aimed at overweight youngsters, attaining a positive self-view may be very difficult. A study of five-year-old girls (Davison & Birch, 2001) revealed that lower self-concept is noted among higher-weight children even at that young age. More alarming, though, is the finding that this low self-concept is often paired with lower perceived cognitive ability. High self-esteem measures have been found to relate positively with academic success in school (Fasko & Fasko, 1998), while poor academic achievement has been inextricably tied to poor self-esteem—which often

comes as a result of peer rejection and harassment (Galanaki & Kalantzi-Azizi, 1999). The actual relationship between obesity and academic achievement, however, has yet to be examined.

A review of pertinent literature in relation to the psychosocial effects of juvenile obesity has left some questions unanswered. While a link between self-efficacy and academic achievement has been suggested, the role that childhood-based low self-efficacy and esteem play in determining academic success in obese youngsters has not yet been fully explored. Though reports have indicated self-perception of low academic ability in obese populations (Davison & Birch, 2001), there is little available research to suggest that overweight children indeed receive lower grades or scores on standardized tests. While a great number of studies reveal a causal link between obesity and lower levels of self-esteem and self-efficacy, only one study has suggested that there is no apparent link between obesity and academic achievement in juvenile males—maintaining that obese boys may overcompensate for athletic shortcomings by excelling in the academic arena (Corbin et al., 1997).

A comprehensive study that investigates any correlation between juvenile obesity and its implications for academic achievement would be beneficial for several reasons. If a link between weight status and achievement is indeed found, this information could help state and local agencies create programs that might aid an overweight juvenile population. Teachers and administrators might also gain insight regarding the level and type of added attention this population may need, and adjust present practices to address poor achievement. Most importantly, though, establishing a link between juvenile

obesity and academic achievement levels might serve as a catalyst for educational researchers to develop means by which these risks might be best addressed.

Literature Review

Juvenile obesity is a condition characterized by increased risks for medical problems and psychosocial adjustment difficulties. Overweight children are often subject to ostracization, prejudicial treatment, neglect, avoidance, and ridicule, and all of these behaviors could damage or alter development of a child's self-concept (Fox & Edmunds, 2000). Additionally, links between low self-esteem and self-efficacy in childhood and adolescence point to an increased likelihood of depressive behaviors that may reoccur well into adulthood (Bandura et al., 1999; Corbin et al., 1997; Davison & Birch, 2001; Guinn, Semper, & Jorgensen, 1997). These depressive behaviors have in turn been linked to detrimental effects on academic achievement in juvenile populations (Corbin et al., 1997). In an era where cultural sensitivity and acceptance of diversity is prized, a better understanding of the psychological baggage society attaches to obese children and adolescents and its effect on academic success seems warranted.

Prevalence and Causation of Juvenile Obesity

The epidemic status of juvenile obesity is well documented. Reports indicate that the incidence of juvenile obesity has increased at least 50% since 1976 (Myers & Vargas, 2000). According to Fox and Edmunds (2000), nearly one in five children today can be characterized as overweight. The numbers are even higher in the population of children aged 9 to 11 (Rudolf, Sahota, Barth, & Walker, 2001). In addition, medical science has determined in the past few decades that being fat as a child has both immediate and long-term physical effects, such as respiratory problems, coronary heart disease, diabetes,

hypertension, and gall bladder disease (Fox & Edmunds, 2000). This increased risk of illness is often cited as the primary reason for concern regarding fat children. Indeed, some investigators (Cohen & Budesheim, 1997) have suggested that the transference of adult fears and predispositions in relation to disease may account for negative perceptions of overweight children. While concerns regarding the health and physical well-being of obese children are certainly worthy of attention, the social and psychological impact of obesity on a child's development cannot be overlooked. The psychosocial impact of negative self-perceptions may be much more serious than the physical risk of disease (Mills, 1995).

The cause of obesity has been characterized as a combination of genetic, metabolic, biochemical, cultural, and psychosocial factors (Patz, 2000). While the tendency may be to blame the child for his or her fatness, investigations by Epstein, Klish, and Slyper (as cited in Myers & Vargas, 2000) reveal that (a) if both parents are obese there is a 70% chance their child will be overweight, and (b) if one parent is obese there is at least a 50% probability that any offspring will also be obese. Griffiths and Payne (1976) found that metabolic rate has a familial pattern, thereby inferring that excess weight may not necessarily be a result of overeating. In light of these findings, the argument that genetic predisposition greatly contributes to juvenile obesity is hard to ignore. Hence, preventing or treating obesity may not be easily achieved through nutritional guidance or behavior modification, and the resulting frustration on the part of the child may damage his or her self-esteem (Loewy, 1998). Perhaps, then, the focus of societal efforts in relation to fat children should shift to areas where intervention may

make a difference: bolstering damaged self-concepts and enhancing developing self-efficacy.

Self-esteem, Self-efficacy, and Human Agency in Obese Children

Perceived self-efficacy, belief in one's capability to produce a particular attainment, has been characterized as the foundation of human agency (Bandura, 1989; Bandura, 1996; Bandura et al., 1999; Bandura et al., 2001). Bandura theorized that unless people believe they can accomplish specific goals they will have little incentive or desire to succeed or persevere in the face of difficulty (Bandura et al., 1999). Harassment and prejudicial treatment of children based on weight and appearance have been shown to negatively impact a child's perception of his or her cognitive ability as well as self-esteem (Davison & Birch, 2001). Based on established links between self-esteem and self-efficacy (Bandura et al., 1999), it seems reasonable to conclude that a child's perception of his or her efficacy may also be distorted by the reactions and behaviors of peers and authority figures.

Psychosocial Threats

Overweight children have an increased risk for psychological problems and are more likely to be isolated, rejected and ostracized (Fox & Edmunds, 2000). Loewy's review of pertinent literature (1998) reveals that obese children are viewed by their peers, teachers, counselors, and parents prejudicially, which sometimes manifests itself by making the child a target of ridicule or disgust.

Indeed, much research has been done to establish negative likability and trait attributions of peers and adults in relation to juvenile obesity. Cohen, Klesges, Summerville, and Myers (1989) examined how first, third, and fifth graders integrated

information when forming impressions of a peer. They sought to determine whether weight, behavior, and gender contributed to likability, and if so, which characteristic was the most influential. A total of 240 children attending a public elementary school in a large city participated. Each child listened to four stories representing characters with a combination of behavior and body types delivered in a quiet room via audiocassette player. The children then answered questions related to their impressions or likability of those characters. Developmental evidence was found for less liking of overweight peers among first and third graders, particularly among males. Children of both sexes preferred the average physique target to an overweight target—suggesting that a negative stereotype of an obese subject is prevalent even at a young age.

This pattern of disapproval appears to begin quite early in life. In a comprehensive study examining body confidence in pre-school youngsters and cognitive theory, overweight children were most often perceived as inferior to their average-weight peers (Hendy, Gustitis, & Leitzel-Schwalm, 2001). Investigators in this instance wished to ascertain whether young children related competence to body image. They gathered variables from child interviews and questionnaires for 94 pre-school children, and proceeded to query the subjects as to their opinions of children of different sizes. Participants were also engaged in a role-playing process that enabled average-weight students to react to themselves as if overweight. Upon analysis of the data, obese children were found much more likely to be seen as sloppy, lazy, and prone to dishonest behaviors. Mothers were most often indicated as the root or reinforcement agent of these assessments. In other words, these results suggest that dislike for overweight peers may be an attitude attained by modeling the behavior of parents or other adults (Hendy et al.).

Prejudicial reactions and behaviors only seem to increase in the lives of obese children as youngsters age. Cohen and Budesheim's study (1997) of likability and peer trait attributions examined how children integrate multiple types of information when forming impressions. The investigators wished to ascertain how youngsters categorize and react to hypothetical peers of varying weights and behavioral characteristics. Based on previous studies, they suspected that body weight would play a meaningful role in the development of likability. A total of 200 elementary school children, divided across grades and across sex, participated in role playing exercises which introduced hypothetical peers of varying sizes and different genders. Participants were then asked a series of questions to determine which particular traits might most typically be found in each peer. Subjects were also asked to rank the hypothetical peers in relation to likability. Findings of the study supported the researchers' initial assumption. Analysis of the data revealed that older children (those 10-to-12 years of age) inferred the greatest degree of disliking to the overweight subjects of either sex. This suggests that awareness of the social milieu that creates standards of appearance increases with age, perhaps peaking in preadolescence (Cohen & Budesheim). It is not surprising, then, that weight-related name-calling, ridicule and torment at the hands of peers has been characterized as pervasive and detrimental (Fox & Edmunds, 2000).

Dion (1986) claimed that adolescent concerns about physical appearance should not be underestimated or dismissed, particularly in light of the typification of thinness and beauty that children are exposed to at an early age. The effect this stereotypical view has upon its purveyor, though, may not be as damaging as the detrimental effect that likely impairs the self-esteem of the heavy child. While perpetrators of insulting and

prejudicial behaviors may someday feel remorse for their actions, obese children may endure the consequences for the rest of their lives.

Psychosocial Anxiety

The tendency toward self-loathing and poor self-esteem in overweight adolescents, perhaps a result of earlier psychological torment, seems to be exacerbated at puberty. Hart, Leary, and Rajewski (1989) coined the label *social physique anxiety* (or SPA) to refer to the negative feelings that may or may not result from outside evaluations of one's physicality. In other words, if an adolescent is overweight and thrust into a situation (a gym class perhaps) where ridicule or harassment of his or her physique may ensue, an overwhelming sense of fear may prevent socialization or participation in a given activity. Bandura et al. (1999) might suggest that social physique anxiety damages social efficacy, a cited pathway to depression, as vulnerability and uncertainty become pervasive in an adolescent's daily life based on appearance alone. Moreover, the theoretical viewpoint that low self-efficacy clears a direct path to depression suggests that damage at the hand of social physique anxiety may be more than fleeting or situational, adding immediacy to the need for a more caring societal response to the plight of the overweight child.

Recognition and Acceptance of Obesity

An obese child is not only subjected to the effects of society-at-large. One of the many difficulties inherent to the psychological nurturing of obese children is related to parental perception. In order for parents to address the social and health concerns of their obese children, though, they must first recognize that their children are overweight. Parental obesity has been documented as a reliable predictor of childhood obesity (Myers

& Vargas, 2000). This could explain why many parents don't perceive a weight problem in offspring: to admit a child is fat would be to realize and affirm one's own obesity.

Baughcum, Camberlin, Deeks, Powers, and Whitaker (2000) conducted an examination to determine whether mothers perceived themselves or their children as overweight—and to measure the number who failed to recognize overweight in their children or themselves. They hypothesized that many mothers might contribute to obesity in their children through a benign negligence that equates plumpness with good health. A study of 622 mothers of preschool children in Kentucky and Ohio were given a questionnaire that included queries as to maternal attitudes about their own weight and their child's weight, child eating behaviors, maternal practices and beliefs about feeding, and family demographics. Body mass indices were recorded for each participant and child. Analysis of the data revealed that only 21% of the nearly 100 children considered obese by body mass indices were characterized by their mothers as being overweight. Socioeconomic status and family background did not seem to play a role in the study, suggesting that problems with the recognition of obesity may be pandemic (Baughcum et al.). Other studies parental perception and the weight of preschool children have revealed similar findings (Myers & Vargas, 2000).

Even parents of adolescents have been shown to experience difficulty in identifying obesity in their children. A study by Goodman, Hinden, and Khandelwal (2000) investigated the accuracy of teen and parental reports of obesity. The researchers sought to determine whether adolescents and their parents would accurately assess obesity in themselves as related to body mass indices (BMI). The investigators hypothesized that a substantial number of participants might not recognize that they were

indeed overweight. Weighted data from the National Longitudinal Study of Adolescent Health was examined in the process of the study. Weight, height, and age data from over 15, 950 adolescents was noted, and transcripts of in-home parent interviews were matched to the data gathered for each child. Researchers specifically noted the relationship between an adolescent's actual BMI quotient and the parent's response regarding whether the adolescent subject was considered *underweight*, *average-weight*, *overweight* or *very overweight*. The researchers' initial hypotheses proved correct. Nearly half of those children categorized as overweight by BMI were not considered so by parental report, and nearly 70% of those categorized as very overweight were considered only average-weight or overweight by parents. While obesity is an observable, external feature, the number of parents who fail to recognize it in their own offspring suggests that parental biases resulting from distress or psychological symptoms may impact willingness to label a child as obese (Goodman et al., 2000).

As to parents who are obese themselves, the work of Bandura et al. (1999) suggests that adult depression stemming from life-long low self-efficacy may play a part in this behavior. Mothers may also recognize that a child is overweight and not address it, believing that the child will grow out of it or that a large child signifies good health and competent parenting (Baughcum et al., 2000). As Myers and Vargas (2000) suggest, parent recognition of a child's obesity must exist before any type of treatment or psychological counseling can take place.

Many parents, though, do recognize obesity in their children. Harter (1999) maintains that parental approval has been shown to be a robust predictor of self-esteem in children that has more impact than peer approval—at least until early adolescence. Since

parents are typically considered the primary motivators of children's socialization (Gable & Lutz, 2000), a parent's reaction to a child's obesity has serious implications. Weight-related issues and biases are often transferred to children (Field, Camargo, Taylor, Berkey, Roberts, & Colditz, 2001). Pierce and Wardle's examination of cause and effect beliefs related to self-esteem in overweight youngsters (1997) revealed that children are accurate evaluators of their parents' perception of their body shape. Parents' concerns and reactions to their child's weight status and restriction of food or forced exercise have been associated with negative psychological outcomes (Davison & Birch, 2001). As a result, a father or mother's negative verbal or behavioral response to a child's weight could lead to self-esteem degradation from perhaps the most potent source. A failure to respond seems just as damaging. Gable and Lutz (2000) reported that a parent's lack of concern about a child's heft can be as detrimental to a child's development as a berating or obsessive response. This appears to solidify the notion that parents can be key contributors to low self-esteem in children.

Unlike some parents, adolescents seem to have no difficulty in identifying themselves as overweight and unhappy (Pritchard, King, & Czajka-Narins, 1997). A teenager's sense of correlation between obesity and low self-esteem, however, appears weak. French, Perry and Story (1995) suggest that while adolescents may readily admit they have low self-esteem, they don't link these feelings of inadequacy to their obesity—perhaps because of denial or a subconscious desire to avoid stigmatization. At a time when peer group norms and social expectations play perhaps the largest role in the development of self-concept (Pritchard et al., 1997), adolescents suffering self-esteem deficiencies which impair socialization may be setting themselves up for future

depressive episodes (Bandura et al., 1999) and academic difficulties (Bandura et al., 1989; Bandura et al., 2001).

Self-concept, Body Image and Society

Popular culture may be responsible for some of the self-concept difficulties experienced by adolescent children and adolescents. The media has long been accused of fostering a positive portrayal of overly thin female images that may lead to distorted body image reaction and dissatisfaction even in very young girls (Field et al., 2001). Recent media focus on chiseled, muscular male torsos may be having a similar effect on boys (Eklund & Bianco, 2000). The media, though, cannot overtly stigmatize or criticize an overweight youngster. Rather, these television and print portrayals seem to exacerbate the tendency for peer groups and society at large to judge others based on physical appearance and increase the self-loathing and angst an overweight child may already be experiencing (Eklund & Bianco, 2000).

Not surprisingly, then, one area in which teenagers suffer a great deal of anxiety has to do with body-related concerns (Edmunds et al., 2001; Eklund & Bianco, 2000). Obese children have been found significantly more likely to express concern about their weight and exhibit dissatisfaction with body image. Vander Wal and Thelen (2000) compared obese and average-weight adolescents with regard to concerns about being or becoming fat. They hypothesized that obese youngsters would be more likely to express body dissatisfaction and engage in behaviors that might lead to eating disorders. Participants in this investigation included 526 obese and average-weight adolescents to whom questionnaires were distributed. Data regarding gender, obesity status, and grade level were collected and recorded from the questionnaires containing sections related to

personal image, dieting behaviors, and self-esteem. The results confirmed the aforementioned hypothesis. Obese adolescents were significantly more likely to engage in harmful dieting behaviors, express concern about their weight, and exhibit dissatisfaction with both their body image and social status. These findings suggest that adolescence is perhaps a time when esteem is most affected (Vander Wal & Thelen). Harter (1999) maintains that poor body image in relation to weight is significantly related to poor self-esteem. These negatively viewed aspects of one's physical self, culminating in body dissatisfaction, can have a dramatic and stifling effect on social development (Guinn et al., 1997).

Obesity is an observable, external feature that cannot be hidden. As a result, societal judgment is unavoidable, and the effects are often internalized. French et al. (1995) have characterized obesity as a highly subjective and overtly emotional experience of both self- and body image that is significantly associated with low self-concept. It follows, then, that a positive view of oneself has been deemed necessary in order to maximize self-concept and self-esteem (Marsh, 1999).

Perceptions of Cognitive Ability

Considering the negative perceptions aimed at overweight youngsters, attaining a positive self-concept may be nearly impossible. Indeed, self-concept problems may begin at quite an early age. Davison and Birch (2001) examined the relationship between weight status and self-concept in a sample of preschool-aged girls, questioning whether parental concern about a child's weight would be associated with negative self-evaluations. Participants were 197 five-year-old girls and their parents. Girls' BMI was calculated and self-concept was assessed using an individually administered

questionnaire, and parental concerns were assessed using a self-report instrument. Findings suggested that lower self-concept is noted among girls with higher weight status. Additionally, parental concern about a child's weight was associated with negative self-evaluations among the girls. More alarming, though, was the finding that this low self-concept is often paired with lower perceived cognitive ability (Davison & Birch). This low perception of cognitive ability seems to be related to self-esteem in children and adolescents. High self-esteem measures have been found to relate positively with academic success in school (Fasko & Fasko, 1998), while poor academic achievement has been tied to social dissatisfaction in school—which often comes as a result of peer rejection and harassment (Galanaki & Kalantzi-Azizi, 1999).

This phenomenon does not magically disappear after adolescence. Recent research has suggested that low educational attainment levels in obese populations are the norm, and the main reason cited for withdrawal from formal education may be ridicule from peers and others. Molarius, Seidell, and Sans (2000) investigated educational level, relative body weight, and changes in their association in a longitudinal study. They hypothesized that obesity may play a role in preventing individuals from seeking or attaining higher educational levels. Using data accumulated through the MONICA project (an investigation of trends and determinants for cardiovascular disease) they explored the extent to which obesity was related to the distribution of education in the population. The researchers compared BMI with educational level attainment and tracked 200 individuals of each sex for ten years. Data obtained from questionnaires confirmed the researchers' initial hypothesis. A statistically significant inverse association between educational level and BMI was found in all populations. In essence,

the leaner participants of both sexes attained higher levels of educational attainment in both sexes. While reasons for this association were not explained in this particular study, the researchers suggested that societal reactions to overweight persons could be at the root of the phenomenon (Molarius et al.).

Not all of the research examining the relationship between cognitive ability and obesity, however, supports the notion that greater weight leads to lesser achievement. Indeed, one particular study would suggest that obesity has just the opposite effect on achievement in a specific adolescent population. Corbin et al. (1997) examined scholastic competence and self-esteem in relation to weight status in middle school children. These investigators questioned whether overweight children would indeed exhibit lower perceived competence manifesting itself through poor academic performance. Fifth through seventh grade students from three different schools in a southwestern city served as the subject sample. The sample included 324 boys and 326 girls. BMI was attained through caliper measurement and compared to results from Harter's Perceived Competence Scale for Children. The findings of this study suggest that there may be a relationship between obesity and low perceived academic competence in girls--but not boys. For fifth and sixth grade male subjects scholastic competence had a modest negative weighting, suggesting that the heavier boys may have chosen scholastic achievement as a means of compensating for poor athletic competence (Corbin et al). Further research may determine whether this particular finding is in fact anomalous.

The tendency for overweight individuals to underachieve in the academic realm might be explained through other means. Bandura et al. (2001) determined that a child's academic self-efficacy influences the type of occupational activities he or she deems

feasible, suggesting that it is the child's perceived self-efficacy--rather than actual academic capability--which directs occupational and academic goals. Bandura theorized that perceived low academic self-efficacy leads to depression both directly and indirectly through its effects on pro-social interaction and engagement in problem behaviors (Bandura et al., 1999). Fat children, then, may anticipate substandard performance as a result of poor self-concept and begin to view failures, setbacks, and obstacles as insurmountable.

Problem Behaviors

Lower self-concept may also be linked to behavioral difficulties. An example of engagement in problem behaviors can be witnessed in the societal increase of injurious self-targeting acts. A link between low self-concept and deliberate self-injury, particularly among adolescent girls, has recently been established (Nichols, 2000). Jacobson, Aldana, & Collier (1997) have characterized poor body image as the major contributor to practices of self-mutilation and suicide ideation. In addition, the tendency toward eating disorders, bulimia in particular, has been positively associated with overweight pubescent girls and boys (Field et al., 1999). This particular milieu of self-destructive behaviors in response to perceived self-concept seems to support Bandura's argument that self-efficacy, self-esteem, and depression are causally linked.

Intervention Practices

Evidence to suggest that juvenile obesity is not a terminal condition does exist. Myers & Vargas (2000) found that only 33% of obese preschool children and 50% of school-age children become obese adults. While there is not agreement as to the input of genetic predisposition in familial obesity (Myers & Vargas), many people are able to

overcome childhood obesity and maintain normal body weight composition as adults. However, if nearly half of the population of obese children is destined to remain overweight, some action must be taken to lessen societal burdens that may damage self-esteem and perhaps prevent individual success and achievement.

There are no miracle cures for the damaging social effects fat children and adolescents bear as a result of society's response to their corpulence. Current weight-loss research has shown that dieting is ineffective in many genetically predisposed obese youngsters, and may only result in short-term weight reduction for others (Smolak, Levine, & Schermer, 1998; Sahota, Rudolf, Dixey, Hill, Barth, & Cade, 2001). Researchers have recently begun developing primary prevention of eating problem programs aimed at elementary school children, yet the effectiveness of these programs has not been established to date. Smolak et al. (1998) evaluated one such program in an attempt to determine if a primary school healthy eating and body image curriculum might decrease the incidence of poor eating behaviors, attitudes toward overweight individuals, and body dissatisfaction. The researchers questioned whether the institution of a healthy eating and body image curriculum would increase body esteem, change attitudes about overweight people, and enhance exercise patterns in the 5th-grade participants. Of the 222 white public school children participating in the pre- and post-testing, 167 received the in-class curriculum. Results of the study indicated that behaviors, including eating patterns, exercise patterns, weight reduction attempts, and harassment of overweight children were not changed by participation in the curriculum. A similar study (Sahota et al., 2001) of a school-based nutrition and physical education program revealed no appreciable difference in physical activity levels and negligible increases in self-worth

for obese participants in intervention schools. Even pediatricians and dieticians have been found unlikely to deal with psychological effects of obesity, rarely discussing stigmatization or how to confront it (Neumark-Sztainer, 1999). The increased frustration and low self-esteem resulting from these futile attempts to change body image could easily contribute to an impaired sense of self-efficacy.

If the psychosocial consequences of juvenile obesity are indeed as damaging as the literature portrays, the message to society seems clear. Perceptions that negatively characterize obese children and adolescents must be addressed through modeling behaviors that develop mutual respect among youngsters regardless of their appearance, physical ability, or academic performance (Fox & Edmunds, 2000). Sobal (1994) suggested that a feasible alternative to declaring obesity a disability may be to educate people to stop stigmatizing and devaluing the obese. Overweight students themselves have characterized supporting and accepting environments as key in the establishment of self-worth and school comfort (Neumark-Sztainer, 1997). Self-efficacy researchers have suggested that teachers should pay as much attention to perceptions of academic competence as they do actual competence (Pajares & Valiante, 1997). However, for those children and adults already experiencing low self-concept and impaired self-efficacy, research that examines long-term psychological effects of a condition which American society seems to view as only a self-induced physical problem may aid in determining proper interventions.

Statement of Conclusion

A review of pertinent literature in relation to damaging psychosocial effects of juvenile obesity establishes that overweight children are prone to endure low self-

concept, ridicule, adjustment difficulties, and problem behaviors. While a link between self-efficacy and academic achievement has been suggested, the role that childhood-based low self-efficacy and esteem play in determining academic success in obese youngsters has not yet been fully explored. Though reports have indicated self-perception of low academic ability in obese populations (Davison & Birch, 2001), there is little available research to suggest that overweight children indeed receive lower grades or scores on standardized tests. While a great number of studies reveal a causal link between obesity and lower levels of self-concept and self-efficacy, one particular study has suggested that there is no apparent link between obesity and academic achievement in juvenile males—maintaining that obese boys may overcompensate for athletic shortcomings by excelling in the academic arena (Corbin et al., 1997).

Themes revealed in the literature examining the relationship between obesity and achievement fall into three distinct categories: the relationship of weight to self-esteem (Do obese children and adolescents have poor self-concept?); the relationship of weight to self-efficacy (Do obese children and adolescents perceive themselves as incapable?); and the relationship of weight to perceived cognitive ability (Do obese children and adolescents believe they are academically inferior?). While all of these themes are worthy of further study, the impact of poor academic achievement may be the weightiest. If it is determined that obese juveniles and adolescents do face increased educational risks, then developing means by which these risks may be addressed will be imperative. Addressing cognitive ability and academic achievement deficiencies may also have an effect on problem behaviors, poor self-concept, and inefficacy in this population. None

of this, though, is likely to take place until the link between obesity and academic achievement becomes more than just speculation.

Investigation Purposes

In order to create means and techniques to address academic and achievement risks that affect obese juvenile and adolescent populations, it seems reasonable to first ascertain that academic achievement deficiencies in fact exist. The purpose of this quantitative study will be to relate obesity to academic achievement for adolescents in Florida schools.

Research Questions

Establishment of the nature and breadth of the problem, if existent, could effectively be attained through consideration of the following questions:

1. How do obese adolescents differ from average weight or underweight adolescents in terms of academic achievement in Florida schools?
2. How do obese male adolescents differ from obese female adolescents in terms of academic achievement in Florida schools?
3. How do obese 8th-grade adolescents differ from obese 10th-grade adolescents in terms of academic achievement in Florida schools?

Hypotheses

Null Hypotheses

1. There is no difference between obese adolescents and average or underweight adolescents in terms of academic achievement in Florida schools.

2. There is no difference between obese male adolescents and obese female adolescents in terms of academic achievement in Florida schools.
3. There is no difference between obese 8th-grade adolescents and obese 10th-grade adolescents in terms of academic achievement in Florida schools.

Directional Hypotheses

1. Obese adolescents in Florida schools will have lesser academic achievement than average or underweight adolescents.
2. Obese male adolescents in Florida schools will have lesser academic achievement than obese female adolescents.
3. Obese 8th-grade adolescents in Florida schools will have greater academic achievement than obese 10th-grade adolescents.

The goal of this investigation, then, is to determine whether obese adolescents are indeed an academically “at risk” population that has not yet been addressed. Ascertaining the depth or breadth of the problem may be the first step toward both an examination of possible causes for the phenomena and research that might yield remedies for what has been characterized as a growing problem.

Methods

Previous studies examining the impact of juvenile and adolescent obesity have yielded measures of low self-concept and suggested that this deficiency could be linked to poor academic achievement (Galanaki & Kalantzi-Azizi, 1999). The purpose of this study will be to relate obesity to academic achievement in Florida schools.

Research Approach and Design

A correlational explanatory design where several variables will be examined in an effort to explain the association between weight, age, gender, and academic achievement will be employed in this investigation. This design was selected due to its applications for exploratory research and its benefits when collecting data from a large number of subjects with data on more than one variable. It is expected that this design will be useful in generating hypotheses for future research while providing data that might be helpful to many different researchers.

Research Setting and Participants

School Districts

The Florida Department of Education website will be accessed to obtain a list of all of the full service school districts in the Northwest Region of Florida and the names and contact information for their superintendents. A full service district is one that provides pre-K to grade 12 traditional education as well as comprehensive services for special needs students. Each selected district's administrative officer will be contacted by letter to request that district's participation. All districts that agree to participate will be included. The local districts will decide how many and which of the schools will participate. The names of principals will be obtained by the districts and each principal will be contacted by phone and by letter. Individual classroom teachers will be selected by principals to coordinate testing.

Materials soliciting participation in the study will be sent to the parents and guardians of all students enrolled in grades 8 and 10 in the participating classes. Included will be a letter from the principal stating the district's participation in the study, a letter

from the investigator requesting consent for the child to participate, a brief description of the study, and two copies of a parental permission form appropriate for use with studies involving human subjects. One copy of the permission form will be designated for return while the other will be kept by the parent. A student will qualify as a subject when a properly executed consent form is returned.

Participants

Eight hundred children and adolescents from Northwest Florida schools will compose the subject pool for this investigation. This number was selected to detect the minimum worthwhile correlation of 0.1 (equivalent to an effect size of 0.2). The measured sample will include all students enrolled in designated classes whose parents had returned completed forms granting permission for the child's participation. Severely and profoundly handicapped students, as well as students in special programs where no GPA is accumulated, will be excluded from the subject pool. The distribution of boys and girls will be a result of the number that become participants in the study and have the required data in their student records (weight, height, scores, etc.).

Instrumentation

The data collection instruments chosen for this study were selected to elicit a standard measure of obesity (Body Mass Index or BMI Measure), determine the student's classroom achievement (Grade Point Average) and determine the student's achievement in relation to other students (FCAT norm-referenced test). Age, gender, and grade level will be determined through student records.

Operational Definitions of Variables

Body Mass Index (BMI). Weight status of participants will be assessed using the CDC Table for Calculated Body Mass (Centers for Disease Control, n.d.). The formula used in the United States is $\text{Weight in pounds} / \text{Height in Inches} / \text{Height in Inches} \times 703 = \text{BMI}$. This formula is applicable to populations from 2 to 20 years of age. The value will then be plotted on the BMI-for-age growth chart to determine whether the participant falls into acceptable, overweight, or obese categories.

Florida Comprehensive Assessment Test (FCAT). The primary purpose of the FCAT is to assess student achievement of the high-order cognitive skills represented in the Sunshine State Standards (SSS) in Reading, Writing, and Mathematics. A secondary purpose is to compare the performance of students in Florida to the performance of students across the nation using a norm-referenced test. All students in grades 3-10 take the FCAT in the spring of each year. For the purposes of this study, FCAT reading and mathematics norm-referenced test scores will be examined. Students taking this section of the FCAT receive scale scores that range from 424-863 across all grades. National percentile ranks, stanines, and content subscores are all reported (Florida Department of Education, 2001). In this instance, individual student percentile ranks and scale scores will be examined. Students with incomplete FCAT data, conservatively estimated at 80 participants or 10% of the subject pool, will be excluded from the study and not included in the stated sample size of 800.

An independent evaluation of the FCAT program by the Manhattan Institute of Policy Research (Greene, 2001) examined the reliability and validity of the FCAT norm-referenced math and reading sections for grades eight and ten. The report established that

FCAT math and reading results are highly correlated with the results from a nationally recognized test, the Stanford 9, and suggests that the FCAT is a reliable measure of student performance. These analyses strongly support the validity of the FCAT reading and math results, as scores on the high-stakes FCAT were very similar to scores on the low-stakes Stanford 9, and there would be little incentive for schools to manipulate results of the low-stakes test.

Grade Point Average. Cumulative grade point averages (GPAs) will be determined for each participant on a 4.0 scale. In instances where a 5.0 scale is employed, GPA will be converted mathematically to the 4.0 scale. Students with incomplete GPA data will be excluded from the study. GPA is widely accepted as a valid and reliable measure of student achievement.

Data Collection Procedures

In 2001, then Secretary of the Department of Health, Robert C. Brooks M.D., mandated a weight screening initiative for public school children. Children attending full service schools in all 67 of Florida's counties had their height and weight measured by a school nurse (Florida Department of Health, 2002). Calculating BMI will be facilitated by using this data. Florida plans to continue this program in the autumn of each year. The researcher will visit each participating school and assign each subject a numerical identifier correlated to his or her name on a master participant list. A calculated body mass index height and weight table will be referenced to indicate BMI on a chart designed expressly for that purpose. This same chart will have spaces for the recording of age, sex, GPA and FCAT scores. All of this data will be available in the offices of participating schools.

The time necessary to complete data collection has been conservatively estimated at 10 weeks. To ensure accuracy and procedural reliability, data will be examined by the researcher at each participating school, and charting will be rechecked against student score reports to ensure that notations are consistent.

Data Analysis Procedures

Once data collection procedures have been completed, all height and weight data will be calculated as a BMI score to facilitate numerical input. To that end, all data obtained from this study will be subjected to statistical procedures using SPSS 8.1 software.

In order to facilitate correlational testing, the dependent variable(s) of GPA and FCAT scores will be treated as continuous. While some researchers have argued that GPA in particular cannot be considered interval data (Schmid, 2002), the practice of using GPA as a continuous variable is well established (Glass & Hopkins, 1996). Pearson product moment correlation will be used to test for covariance between the continuous independent variable of BMI and the continuous dependent variables of GPA and FCAT scores when examined individually. In other words, the categorical variables (male/female) will be isolated and run as separate tests for the third question. Means can then be compared.

Pearson r is useful in determining the magnitude of association between variables and detecting the direction of a relationship. Conducting Pearson r with GPA and FCAT scores separately will allow for examination of each dependent variable in isolation. This test meets the assumption for all three questions/hypotheses when both the independent

variable (BMI) and the dependent variables of GPA and FCAT scores are treated as continuous and the distribution of scores is expected to be normal.

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Problem Statement (80 points) Earned = Total =

Yes	No	Implied	Elements & Idea Flow of Problem Statement
			1. Topic for study
			Stated in title
			Introduced in topic sentence
			Included a narrative hook
			Clearly a subject area
			2. Research problem
			Used marker words - The problem is
			Differentiated from purpose of study
			Is a concern or issue that needs a solution
			3. Justification of problem
			Personal experience
			Workplace experience
			Other researcher findings
			4. Deficiencies of past research
			Not adequate addressed
			Not sufficient evidence to prove
			5. Related to target audience
			Used marker words - the intended audience is...
			Single audience
			Multiple audiences
			Indicated how investigation will help audience

Note. Table based on Creswell, pages 73-80

Literature Review (100 points) Earned =

Yes	No	Sometimes	Implied	Elements
				Introductory Statement
				Headings in APA Format
				Themes identified
				Study-by-study format
				Problem
				Questions
				Data collection
				Results/Findings
				Transitional sentences
				Concluding statement
				Theme summary
				Deficiencies
				Rationale for study

Note. Table based on Creswell, pages 112-121

Purpose, Questions, Hypotheses (80 points) Earned =**Quantitative Investigation**

Yes	No	Implied	Elements
			Purpose Statement
			Single sentence used
			Begins with signal words
			Relates, compares, describes
			Independent, Dependent, Control
			Participants and site
			Questions
			Question asked
			Begins with how, what, why
			Independent, Dependent, Control
			Describe, Compare, Relate
			Participants and site
			Null hypotheses
			Begins with no difference
			Independent, Dependent, Control
			Participants and site
			Alternative hypotheses
			Directional/nondirectional prediction
			Independent, Dependent, Control
			Participants and site

Note. Table based on Creswell, pages 140-145

Qualitative Investigation

Yes	No	Implied	Elements
			Purpose Statement
			Single sentence used
			Begins with signal words & Qualitative
			Research design
			Central phenomenon
			Explore, discover, describe, understand
			Participants and site
			Questions
			Central question
			Begins with how, what, why
			Central phenomenon
			Participants and site
			Subquestions: issue or procedural
			Begin with how, what, why
			Central phenomenon
			Participants and site

Note. Table based on Creswell, pages 148-153

Method (100 points) Earned =

Yes	No	Implied	Elements
			Statement of approach or design
			Identified qualitative or quantitative
			Identified with a heading
			Sufficient explanation/description
			Setting for study
			Access described
			Participants
			Clear description of who & where
			Clear description of how selected
			Instruments
			Data needed
			Reliability/validity evidence
			Copy of instrument
			Method
			Summary of data collection procedures
			Collecting permissions
			Sampling described (quantitative)
			Population
			Sample size and why
			Sampling process
			Sampling described (qualitative)
			Sites and individuals needed
			Process of selection
			Number of sites and individuals
			Summary of data analysis (quantitative)
			Missing data
			Scoring procedures
			Input procedures for analysis
			Descriptive statistics anticipated
			Statistic(s) selected
			Why
			Assumptions met
			Summary of data analysis (qualitative)
			Source of data & tools
			Organization and analysis
			Coding and developing themes
			Validating accuracy of findings

Note. Table based on Creswell, chapters 6 and 7

APA Formatting (45 points) Earned =