

Circumstances, Resources, and Weight Status Outcomes Among Middle School Students

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Abstract

Obesity continues to plague U.S. school-age populations. A number of individual/structural circumstances have been identified as increasing the risk of poor health among children. The article's aim is to examine some of these circumstances and their relationship to students being overweight/obese, while highlighting resource variables as potential mediators to these negative circumstances. Using a sample of fifth- to seventh-grade students ($n = 334$) attending a middle school in Northwest Arkansas, logistic regression models assessed the odds of students being overweight/obese compared with students of normal weight for their age and gender. Overall, students with higher depressive symptomatology and lower perceived social class were more likely (higher odds) to be overweight/obese. Students reporting higher levels of social and psychological resources were less likely (lower odds) to be overweight/obese; an inspection of changes in the circumstance's coefficients found once resources were introduced, resources appeared to play some mediating role in the final model.

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Introduction

Childhood obesity is a major public health problem and has received a great deal of attention due to its broader economic consequences and long-term effects on children's health, academic accomplishments, quality of life, and productivity into adulthood (Currie, DellaVigna, Moretti, & Pathania, 2010). At present, nearly 35% of school-aged children in the United States are overweight and just under 19% are obese (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010). These statistics have public health professionals concerned because of the complicated health risks linked to poor weight status; higher rates of diabetes, hypertension, and heart disease have been reported among both overweight and obese youth and adults (Freedman, Mei, Srinivasan, Berenson, & Deitz, 2007; Schwimmer, Burwinkle, & Varni, 2003). Given this heightened concern, a body of literature has developed in an effort to better understand the relationship between social, psychological, economic, and cultural circumstances and weight outcomes (Kim, Subramanian, Gortmaker, & Kawachi, 2006; Link & Phelan, 1995; Lytle et al., 2011).

Research examining obesity has successfully documented individual and/or community-level risks associated with poor health outcomes. Individual circumstances like poor mental health and low socio-economic status have been noted as important correlates of negative health outcomes among youth (Ali & Lindstrom, 2005; Almgren, Magarati, & Mogford, 2007; Goodman, Slap, & Huang, 2003). Despite the utility in this type of research, most of these studies have not examined the role that social relationships, specifically forms of social capital, play in determining weight status outcomes (high-risk body mass index [BMI] scores) among children. Some studies have attempted to show how family- and community-level social capital get transmitted through processes in which children benefit and, in turn, have positive health and social outcomes (e.g., De Silva & Harpham, 2007; McKay, Bell-Ellison, Wallace, & Ferron, 2007; Singh, Kogan, & Van Dyck, 2008). In these cases, characteristics of parent's social capital (i.e., social connectedness, social cohesion, parent's resources) or neighborhood social capital (i.e., social cohesion, trust, safety, and social reciprocity) have been argued to have an impact on children's health and well-being. In fact, Putnam (2000) has argued that neighborhood and family social capital lessens the negative impact on children and youth living in "socially limited" communities. Clearly, the majority of studies that have attempted to examine the link between social

capital and weight status among youth have engineered a community-level/collective explanation. In only a few cases do we find research examining specific aspects of individual social networks and relationships among children and their connection to poor weight status outcomes like obesity (Goodman, 1999; Kitzman, Dalton, & Buscemi, 2008). In many cases, the assessment of capital or the implication of social connectedness is not through any detailed discourse with the children or adolescents, but rather their parents. The approach used in the current article is to assess social relationships and social capital as it relates to food and eating by directly asking students about these activities, guided by peer norms and values, with their close friends and in some cases, their best friend.

Social capital has been defined by Bourdieu (1986) as “the aggregate of actual or potential resources linked to possession of a durable network” (p. 248). Social capital was distinguished by Coleman (1988) for its functionality as a variety of entities that “all consist of some aspect of social structures” and “facilitate certain actions of actors—whether persons or corporate actors—within the structure” (p. S98). In our study, we address social capital as a concept necessarily linked to both the structure of an individual’s network as well as the quality, norms, and cohesion within that social network.

Social capital is relational; it is often a function of resources that individuals have access to either through the communities they live in or through the relationships they engage in (Kawachi, Subramanian, & Kim, 2008). Either way, research has clearly documented a positive “effect” of capital on health outcomes (Cockerham, 2007; Halpern, 2005; Rosenberg, 1965). Generally, studies show that improved social connectedness with community, school, work, family, and personal networks has positive health outcomes for individuals across the life course. Therefore, social capital can help explain some health inequalities wherein health and healthy resources are differentially distributed. However, as suggested earlier, limited attention has been paid to the role of social capital, measured at the individual level, and its impact on weight status among children. Through the form of healthy social relationships, which provide some psychosocial support, or may lower one’s social isolation through social engagement, increased exercise opportunities, and even healthier eating, social capital matters; and, to what extent or which type is of interest in the present analysis.

Thus, the present study focuses on the relationship among circumstances, resources, and youth being categorized as overweight/obese among a sample of fifth- to seventh-grade students attending a middle school in Northwest Arkansas. While the study examines two individual and structural circumstances and their relationship to students who were overweight/obese, we are particularly interested in the role that resources play in mediating the negative personal circumstances of depressive symptomatology and perceived

social class and the structural circumstance of poverty, on the likelihood that students were overweight/obese. Specifically, we hypothesize that depressive symptoms, lower perceived social class, and meeting the criterion for free/reduced lunch will increase the likelihood that students are overweight/obese. Likewise, we expect the opposite to be true of specific types of resources; we hypothesize that social relationships (increased social capital) and self-esteem (increased personal capital) would lower the likelihood that students are overweight/obese.

Students with more external and internal resources often experience less social isolation, are able to have an easier time navigating social relationships, structures, and the institutions that these resources are embedded in and in turn, are less likely to have problems related to their weight status (overweight/obese). At this particular stage in development, student's social relationships are changing. While their social connections are still in part related to their parents, young adolescents begin to see a new world with new possibilities because of their expanding peer networks. These peer networks have been noted as important determinants of psychosocial health for youth, beyond the parent-child relationship (Wilkinson, 2010). Impacting a wide range of behaviors, we argue that the resourcefulness of students to find ways to lessen/limit their food insecurity is associated with the quantity and quality of the relationships to which important resources are linked. Likewise, students who have limited resources often become isolated and are impacted negatively with regard to health. Beside social capital, psychological resources also have an impact on how students perform, engage in a social environment, and see themselves in the larger social context. These experiences may very well impact decision-making and influence eating habits and general lifestyle.

We further hypothesize that the resources that students acquire may play a mediating role in lessening the negative impact of depressive symptoms, lower perceptions of social class, and structural poverty on being overweight/obese. To our knowledge, no study has examined this link and/or proposed the importance of examining this mediating form of "resource support," particularly as it relates to the way social capital is measured in the present study, and its' role in determining the likelihood that students would be overweight/obese.

Method

Participants

Cross-sectional data were collected from fifth-, sixth-, and seventh-grade students in a local middle school in Northwest Arkansas. Data were collected in

fall 2012 with 361 students enrolled in these grades at the time of the survey and 334 surveys were completed in 15 classrooms (92% completion rate). The 8% of students not completing surveys were either absent because of illness or had some other excused absence. Only three students refused to complete the survey. The average age of students was 11 years old; 54% were female; 21% were Hispanic; 52% of students interviewed were White. Approximately 65% of all students in the surveyed school were free/reduced lunch eligible compared with 56% in the school district, though that number is lower for fifth- to seventh-grade students in the surveyed school. When students were asked how they paid for their lunch, 57% of those surveyed responded by saying that they received free or reduced price lunches at the school.

Procedure

All fifth- to seventh-grade students were eligible to participate in the survey. The written survey was read aloud in first period in all 15 classrooms by trained interviewers. Teachers were asked not to participate in the administration to increase student's comfort in answering questions honestly. In a few cases, teacher's aides were made available to assist any special needs students, but trained interviewers were responsible for the administration of the survey. Students had the freedom to withdraw at any point in the survey; this study was reviewed and approved by the University of Arkansas Institutional Review Board, including an informed consent procedure used for children under the age of 14. No personal identifiers were used in the data collection.

Measurement

Weight status. Height and weight were self-reported by students. While subject to some disagreement, studies have used self-reported height and weight, and found that they provide accurate assessments for BMI calculations among student age populations (Goodman, 1999; Kubik, Lytle, & Story, 2005). In 2007, Arkansas passed an act that required that all students (Grades K, 2, 4, 6, 8, 10) have their height and weight assessed by a trained personnel. The state reports these findings in aggregate by grade only; for those students in Grades 4 and 6 in 2011 in the surveyed school (Grades 5 and 7 in the current study), healthy student BMI scores were found in 65% and 61%, respectively. These percentages are very close to what are reported in the current study (69%) and provide further evidence that self-report height and weight used to calculate BMI scores are valid.

BMI calculations provided weight status categories. BMI was mapped using the Centers for Disease Control and Prevention (CDC) charts that provide estimates based on gender and age (CDC, 2010). Students were classified based on these national standards: (a) underweight (BMI < 5th percentile), (b) normal (BMI 5th-84th percentile), (c) overweight (BMI 85th-94th percentile), and (d) obese (BMI \geq 95th percentile). We eliminated students who were underweight from this particular analysis ($n = 20$; 6%) and combined overweight and obese (30%) into a single category (value = 1) and normal BMI students (64%) in a second category (value = 0). No significant differences in weight status categories were noted across either gender or age groups, so the decision was made to merge all students into a single group. Nevertheless, we control for both gender (1 = female) and Hispanic origin (1 = yes); both as important for determining differences in adolescent population weight status outcomes (Walsemann, Ailshire, Bell, & Frongillo, 2012).

Circumstances. As others have argued elsewhere, particular social and psychological circumstances and situations, both internal and external to the individual, can lead to stress with negative health consequences (Ensel & Lin, 1991). As stated earlier, we expect these negative social circumstances and characteristics to increase the likelihood that students would be overweight/obese. While acknowledging that these relationships can be bi-directional, we argue in this article that students with higher self-reported depressive symptoms and students who subjectively perceive their families to be categorized in a lower class will have higher BMI scores. A considerable number of studies have made the connection between depression and poor health outcomes related to weight status including obesity and diabetes (Luppino et al., 2010; Reeves, Postolache, & Snitker, 2008; Stunkard, Faith, & Allison, 2003). In addition, research has shown that for several reasons (limited access to healthy food, overeating of snack, instant and fast-food, limited recreational opportunities, etc.), lower class children are more likely to have poorer weight status outcomes (obesity) compared with middle or upper class children (Ali & Lindstrom, 2005; Goodman, 1999; Goodman et al., 2003). The same is true in those cases that have examined less subjective measures of class, that is, structural poverty where students or families meet formal requirements for receiving assistance.

Our first individual circumstance variable, *Depressive Symptomatology*, is measured using a shortened version of the original 20-item Center for Epidemiological Studies for Depression (CES-D) Scale. This scale is designed to assess affective depressive symptoms 2 weeks prior to the interview and has been used extensively in measuring depressive symptoms in both adolescents and adults (Radloff, 1977). The version used in the current

study has eight items with individual responses to each item ranging from 0 (symptom experienced less than 1 day) to 3 (symptom experienced 5-7 days). The questions primarily focused on the depressive affect domain of the CES-D. Students were asked if and to what extent they felt sad, lonely, or fearful, as well as whether they had trouble sleeping, eating, getting along with others, and so on in the last 2 weeks. The properties of this measure of depressive symptoms have been demonstrated with very high coefficients of internal consistency when the scale is administered to school-age youth (Fitzpatrick, Piko, Wright, & LaGory, 2005; Resnick et al., 1991). For this sample of students, the brief CES-D was reliable with a Cronbach's alpha = .88. The original CES-D measure was weighted for comparative purposes by a factor of 2.5 (the number of original CES-D items divided by the number of brief CES-D items; that is, $20 / 8 = 2.5$). This weighting provides an important comparison with other samples using the full 20-question CES-D; the newly weighted CES-D had a mean of 14.7 and a standard deviation of 13.1. Clinical caseness scores for the CES-D are 16; these scores relative to the general youth/young adult population appear elevated. Normative scoring for young persons generally falls between a CES-D score of 8 to 10 for non-clinical populations.

The second individual circumstance variable used in the analysis was a subjective assessment of student's perception of their social standing/class. Students were asked, "thinking about the money your family has and the things your family owns, would you think of your family as" upper class (7.5%), between upper and middle class (34%), middle class (37%), between lower and middle class (16.5%), and lower class (5%). This subjective assessment provides some insight into how students see their family circumstance regardless of parent's income, occupation, and so on that are often very hard for students to assess accurately. In addition, subjective assessment of SES seems to be a reasonable indicator of adolescent's status beliefs of their relative social deprivation and its relationship to their health status (e.g., Goodman et al., 2001; Piko & Fitzpatrick, 2001).

A final circumstance variable addresses more objective status, as it relates to class and poverty. Whether or not students qualified for free/reduced lunch is important for determining the extent of poverty and its impact on quality and access to food. Because of this program, students are able to acquire some controlled nutrition throughout the day (possibly hot breakfast and lunch). Regardless, students in lower income brackets are often food insecure and have limited resources that force them into eating fast-food, unhealthy snacks, and so on. As other studies have found, we would expect that lower income students are more likely to be at risk of being overweight/obese. This poverty proxy variable was measured by asking students, "How do you pay for your school lunch?" Responses included, free = 1, reduced price = 2,

parents pay = 3, parents pack my lunch = 4, and other = 5. The variable was recoded with other than free or reduced price = 0, and both free and reduced price = 1. The percent of students who reported that their lunch was paid for by the free and reduced lunch program (57%) closely matches the statistics reported for the school district (52%), suggesting that poverty in our sample is similar to that of the district.

Resources. The first social capital/resource variable was intended to capture the breadth of social connectedness and students were asked: How many close friends do you have? ($\bar{X} = 5$; $SD = 3.6$). Several cues were provided, so that students were able to distinguish between a close friend and general friends.

The second social capital/resource variable constructed was an index comprised of four different ordinal variables that assessed social relationships/friendships among students. These variables, in some cases, assessed relationships related to food and eating and in other cases, simply how connected students were to their friends? The questions included: How often do you have meals at your friend's house? How often do you see your best friend? How often do you have other types of contact (Facebook, Twitter, text, phone, Skype, etc.) with your best friend? How often do you eat meals with your best friend? The response categories to these variables were, never or hardly ever = 1; several times a year = 2; at least once a month = 3; once a week = 4; several times a week = 5; every day = 6. The index was designed to assess the depth of relationships with peers. The scale was moderately reliable with a Cronbach's alpha = .61 ($\bar{X} = 13.4$; $SD = 3.8$).

The psychological resource variable is Rosenberg's self-esteem index (Rosenberg, 1965, 1979). The 10-item scale asks questions pertaining to how students perceive themselves and how they see themselves relative to others. The answers range from 1 = *strongly agree* to 4 = *strongly disagree*. Higher scores indicate greater self-esteem. The scale was reliable with a Cronbach's alpha = .82 ($\bar{X} = 22.4$; $SD = 4.5$).

Statistical Analyses

The analysis focused primarily on cross-sectional relationships with circumstances, social and psychological resources, and the odds of being overweight/obese among fifth- to seventh-grade students. Clearly, cross-sectional data limit our ability to make any predictive statements about the relationships between circumstances, resources, and weight status. Oftentimes in this type of analysis, we would control for standard sociodemographic characteristics like student gender, age, and racial/ethnic background. These characteristics and their relationship to being overweight/obese were examined and

Table 1. Descriptives for Control, Circumstance, Resource, and Overweight/Obese Status Variables.

Variables	\bar{X}	SD	%
Weight status			
Overweight/obese = 1			30.0
Controls			
Gender female = 1			54.8
Ethnic status Hispanic = 1			20.5
Circumstances			
CES-D symptomatology	14.70	13.10	
Perceived social class			
Upper			7.5
Upper-middle			34.0
Middle			37.0
Lower-middle			16.5
Lower			5.0
Poverty free/reduced lunch = 1			57.1
Resources/social capital			
Number of close friends	5.00	3.60	
Social capital index	13.43	3.85	
Self-esteem	22.41	4.51	

Note. CES-D = Center for Epidemiological Studies for Depression.

found to be non-significant correlates. Typically, we would exclude these from the analysis but made a decision to leave gender and ethnic status in the model to control for any differences that were not accounted for when all the students were merged into their respective weight status categories.

The analysis largely examines the likelihood (odds) of students being overweight and obese; logistic regression models examine the independent effects of depressive symptomatology, perceived social class, self-esteem, and social capital/resource variables on the likelihood of being overweight/obese. In addition, we explore the mediating role that psychological and social resources (capital) play in reducing the impact of the negative circumstances on students reporting overweight/obese.

Results

Tables 1 and 2 present descriptive statistics and the Pearson correlations for controls, circumstances, resources, and overweight/obese status among the

Table 2. Correlations Among Control, Circumstance, Resource, and Overweight/Obese Status Variables.

Variables	1	2	3	4	5	6	7	8	9
Weight status									
1. Overweight/obese = 1	—	-.05	-.02	.19**	-.17**	.09	-.16**	-.13**	-.22
Controls									
2. Gender (female = 1)		—	-.02	.11*	-.03	-.06	.14**	.18**	-.07
3. Ethnic status (Hispanic = 1)			—	-.01	-.03	.26**	.07	.01	-.06
Circumstances									
4. CES-D symptomatology				—	-.19**	.08	-.11*	-.06	-.34**
5. Perceived Social Class					—	.26**	.10*	.13**	.29**
6. Poverty (free/reduced lunch = 1)						—	-.13**	-.05	-.20**
Resources/social capital									
7. Number of close friends							—	.01	.19*
8. Social capital index								—	.10*
9. Self-esteem									—

Note. CES-D = Center for Epidemiological Studies for Depression.

* $p < .05$. ** $p < .01$, one-tail t test.

sampled fifth- to seventh-grade students. The percentage of overweight and obese students in this sample is similar to the reported average of elementary/middle school students in the state of Arkansas; Arkansas has one of the top five highest rates of obesity among school-age children. The correlations in Table 2 (one-tail; $< .05$; 01) give us a preliminary indication of what to expect in the logistic regression, all the variables are significantly correlated with the binary overweight/obese variable and tolerance tests for multicollinearity showed no significant intercorrelations among the selected independent variables.

Table 3 presents a series of logistic regression models where blocks of variables were entered in succession; the intention is to examine both the independent effects of each variable and the significance of the block and the role it plays in determining the odds that students would be overweight/obese. In addition, as noted earlier, we were interested in whether the resources played any mediating role in lessening the odds of the negative circumstances on overweight/obese status. Both unstandardized and standardized odds ratios are presented to assess the relationships between controls, circumstances, resources, and the odds of being classified as overweight/obese.

In the first regression model, the two control variables, gender and Hispanic, are added to the "constant only" model, and the block of variables is not significant ($p > .10$) as expected. The second model adds the set of

Table 3. Odds of Overweight/Obese Status Among Middle School Students (n = 334).

Independent variables	Model 1 ^c UOR (SOR)	95% CI	Model 2 UOR (SOR)	95% CI	Model 3 UOR (SOR)	95% CI
Controls						
Gender (female = 1)	-0.200 (0.819)	[0.52, 1.4]	0.287 (0.750)	[0.45, 1.3]	-0.145 (0.865)	[0.49, 1.5]
Ethnic status (Hispanic = 1)	-0.104 (0.901)	[0.48, 1.7]	-0.176 (0.839)	[0.44, 1.6]	-0.057 (0.945)	[0.48, 1.8]
Circumstances						
CES-D			0.025 (1.026)	[1.0, 1.1**]	0.016 (1.016)	[0.89, 1.1]
Perceived social class^b						
Upper-middle			1.428 (4.171)	[0.67, 26.3]	1.370 (3.937)	[0.59, 24.5]
Middle			1.747 (5.740)	[1.3, 29.6*]	1.507 (4.517)	[0.90, 1.0]
Lower-middle			1.575 (4.832)	[1.1, 23.3*]	1.537 (4.652)	[0.82, 17.8]
Lower			1.235 (3.442)	[0.75, 16.5]	1.327 (3.769)	[0.82, 17.8]
Poverty (free/reduced lunch = 1)			0.236 (1.266)	[0.73, 2.1]	0.102 (1.107)	[0.65, 1.9]
Resources/social capital^a						
Number of close friends					-0.079 (0.924)	[1.0, 1.2*]
Social capital index					-0.057 (0.944)	[1.0, 1.1*]
Self-esteem					-0.066 (0.936)	[1.0, 1.4*]
χ^2	0.713		18.25		29.89	
df	2		6		11	
Nagelkerke R ²	.003		.085a		.136a	

Note. UOR = unstandardized odds ratio, SOR = standardized odds ratios; CI = confidence interval; CES-D = Center for Epidemiological Studies for Depression.

^aSignificant block of variables in χ^2 change ($p < .001$).

^bReference categories for the independent variables: social class = upper class.

^cModel 1 = Controls; Model 2 = Controls + Circumstances; Model 3 = Controls + Circumstances + Resources.

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

individual and structural circumstances. CES-D, as hypothesized earlier, increased the likelihood that students would be overweight/obese. In addition, perceived social class was significant and in the majority of cases, using upper class as the reference category, the differences between perceived upper class and lower classes were significant. The odds that students were overweight/obese increased dramatically (by as much as 4-6 times) for students who perceived their social rank to be middle or lower class compared with students who perceived themselves to be upper class. The structural poverty variable, free/reduced lunch, was not significant.

In the third model in Table 3, psychological (self-esteem) and social resources (social capital) were added to the model. All three variables were statistically significantly ($p < .05$); higher self-esteem, greater number of friends, and a more in-depth relationship with those friends lowered the likelihood that students were overweight/obese. In addition to that block of variables being significant (chi-square $p < .01$), these resource variables appear to be playing some important mediating role in the circumstance variables that were significant earlier in the model. Note that the CES-D variable that was significant in Model 2 is no longer significant in Model 3 and lower in terms of the variable's unstandardized odds coefficient. The same was true for perceived social class; while the differences between perceived upper class and middle/lower class students remained significant, the odds coefficients were still lower in Model 3 compared with Model 2. In addition to assessing mediation, we tested for buffering effects of these resource variables and in all cases; none of the interaction effects between circumstances and resources were significant. Thus, this parsimonious model provides important results in the attempt to understand the interrelationships between circumstances, resources, and the likelihood of students being overweight/obese.

Discussion

The present analysis provides some interesting preliminary findings on the relationship between circumstances, social/psychological resources, and the likelihood of being overweight/obese for this sample of middle school students. Not surprising, students with higher depressive symptomatology and lower perceptions of their social class were more likely to be overweight/obese. Similarly, the results show important "lowering likelihood" relationships in the case of both self-esteem and social capital/resources for students. What is perhaps most intriguing is the mediating role these resources play in lowering the likelihood of these negative circumstances on being overweight/obese. While these models could certainly be more complicated in telling the

story of the interrelationship between stress, resources, and the likelihood of being overweight/obese, the simplicity and parsimony underscore the importance of identifying key mediators that might make a difference in lessening the negative impact of particular circumstances on student's weight status.

Several studies have identified the importance of comprehensively examining stressors and their impact on weight status outcomes among school-age youth (Lohman, Stewart, Gunderson, Garasky, & Eisenmann, 2009). An exploration of the interrelationships between known negative circumstances, social/psychological resources, and weight status outcomes offers a new/unique approach. Our analysis provides some preliminary indication of how important it is that these mediators be explored more completely; ultimately identifying how it is we can minimize or lessen the impact of these negative circumstances rather than trying to totally remove them from the student's social, economic, physical, and cultural environment. Finding opportunities for students to have better access to and develop social resources through friendships, neighborhood-based services, and athletic outreach services may be important for developing mediators that lessen the negative impact of particular individual or structural circumstances. Students feel better and are more engaged when they are connected to a social network that can make a positive difference in their health and lifestyle (Wilkinson, 2010). Furthermore, inclusion of students in social networks may reduce risk and enable healthy opportunities in otherwise risky and unhealthy circumstances. Our results indicate that both breadth and depth in peer social networks are important. It is not only how many friends you have but also how you engage with them that may play some role in lessening the negative health outcomes like being overweight/obese.

Study Limitations

While the present study has identified a set of important relationships regarding odds of being overweight/obese, it is not without limitations. Of course we have already mentioned that this analysis is one of cross-sectional relationships and we make no assumptions about causality. While the data for the analysis are based on youth's subjective accounts, there is nevertheless ample evidence to suggest that self-report measures are both valid and reliable among youth. The models are of course limited in scope. However, we purposely did not want to examine an exhaustive list of stressors and resources but rather focus on several key ones that have been addressed elsewhere or have generally been regarded as key elements in understanding the social, psychological, and cultural mechanisms that are important to understanding weight status outcomes among school-age children. While more comprehensive studies are necessary, we feel that these findings are encouraging with

regard to the role that social and psychological resources might play in the complicated relationships between circumstances and negative health outcomes among children. If weight gain is in part related to depressive symptomatology, that clearly has a clinical implication. In addition, if that relationship can somehow be mediated by social relationships and self-improvement, then there are significant implications for families, schools, and the communities in which they are embedded.

Study Summary and Future Research

Altogether, three major conclusions can be made based on our analysis. First, circumstances which children are born into or develop—and have little to no control over—such as their mental health, social class, and general economic circumstances, have a significant impact on their weight status—an important indicator of general health. Second, resources such as self-esteem and social capital—which children themselves, parents, and other people within the child's social networks collectively influence—also have a significant impact on the likelihood of there being overweight/obese. Finally, our findings also suggest that these resources over which adults and children have some influence may actually mediate the impact of negative circumstances/context.

These findings suggest that there is a degree of poor health, in terms of being overweight/obese that can be better understood by certain negative circumstances that children, friends, and family have little control over. However, they do have some degree of agency over the way resources such as self-esteem and social capital are distributed—these resource-linked phenomena are constructed through the many ways in which we interact with one another. Moreover, these resource-linked phenomena have an impact on our health; enough to mitigate some of the negative circumstances over which we have little agency—particularly for children. Thus, social capital and self-esteem may be hopeful targets for health initiatives taken on by any number of groups: families, friends, neighborhoods, schools, or policy makers—aimed at alleviating the influence of negative personal and structural circumstances on overweight/obesity.

We believe that future research can build upon this study by gathering longitudinal data inclusive of key health indicators and social capital measures. In addition, more diverse and comprehensive measures of social capital need to be developed in a way that allows for testing of this model across multiple age groups. To date, there are no social capital instruments that, without modification, lend themselves to comprehensively measure the social capital of youth. Moreover, this model should continue to be tested in

a multitude of settings (i.e., the work place, schools, neighborhoods, larger communities, etc.) to more aptly test the “contextual” effects of varying layers of social capital on the impact of weight status outcomes among children.

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