Social Competence and Obesity in Elementary School

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Objectives. We examined the relationship between children's weight and social competence.

Methods. We used data from the third- and fifth-grade waves of the nationally representative Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999 (n = 8346) to examine changes in children's weight and social competence.

Results. Obesity in third grade was not associated with subsequent changes in social competence between third and fifth grade, but social competence in third grade was associated with subsequent development of obesity. Among normal-weight children, having higher social competence in third grade was associated with lower odds of becoming overweight (odds ratio [OR] = 0.80 ±0.09; $P < .05$) or obese (OR = 0.20 ±0.08; $P < .001$). In addition, obese children with higher social competence were more likely to lose weight between third and fifth grade (OR = 1.43 ±0.25; $P < .05$).

Conclusions. Obesity and impaired social competence often occur together and have serious implications for children's well-being. More knowledge about how weight and social competence affect one another could inform interventions to promote children's social development and reduce obesity. (*Am J Public Health.* 2015;105:153–158. doi:10.2105/AJPH.2014.302208)

Nearly one third of US children are overweight or obese.[1] Previous studies have observed greater victimization and exclusion among obese children[2–4] and negative social and emotional consequences of such treatment from peers, including low self-esteem and depression.[5–9] Despite these documented links between obesity and impaired social well-being, little is known about the relationship between obesity and social competence—the set of skills and behaviors necessary for appropriate and positive social interaction. It may be that obese children, who endure significantly more teasing and victimization by their peers,[2,10] are at a disadvantage in developing the appropriate self-confidence necessary for social competence. At the same time, it may be that low social competence increases risk of obesity, because unhealthy behaviors may result from social stress and social isolation.[11–14]

SOCIAL COMPETENCE IN CHILDHOOD

Social competence is essential in social, cognitive, and emotional development,[15] and encompasses "skills and behaviors of a child that lead to positive social outcomes," including kindness and cooperation, appropriate extroversion, and communication abilities.[16(p4)] Although no set definition of social competence in childhood has been established, approaches to social competence have focused on skills (such as emotional regulation and social problem solving), and on a child's ability to achieve desired social outcomes (such as having friends and being popular).[17]

Social competence is particularly important in middle childhood (6–11 years of age), a time of marked social and cognitive development during which children increasingly develop a sense of self and identity, as well as social understanding.[18] At these ages, social engagement with peers escalates, and children are increasingly influenced by social norms, with peer conformity peaking around 12 years of age.[19] Children at these ages may be highly susceptible to weight-related stereotyping and criticisms, even as they are forming their self-identities, for example, as a person who is thin or heavy, popular or unpopular.[18] Simultaneously, these are vulnerable ages for the development of obesity: the prevalence of overweight and obesity in the United States rises from approximately 23% of children aged 2 to 5 years to 34% of children aged 6 to 11 years.[1] Social competence at these ages is associated with quality of relationships in early adulthood[20] and is beneficial for personal well-being and academic success.[21–24]

POTENTIAL IMPACT OF OBESITY ON SOCIAL COMPETENCE

Obese children face teasing,[25] systematic discrimination,[26] mistreatment,[27] exclusion, and chronic victimization,[2,10] and they experience more peer rejection, victimization, and teasing than children with other stigmatized attributes.[5,28] Children have negative attitudes toward obese children,[29,30] and these negative feelings are held even by children who are themselves obese.[31,32]

A sociological framework for conceptualizing the relationships between obesity and social well-being is Goffman's work on stigma, which posits that, when someone possesses an "undesired differentness," such as obesity, others discriminate against him or her, whether intentionally or not.[33(p5)] Thus, obese children, being stigmatized, suffer considerable social disadvantage because others "impute a wide range of imperfections" onto them, including negative assumptions about their intelligence, honesty, and work ethic.[33(p5)] Therefore, obese children must work harder than others to manage their image and maintain social engagement.

The social consequences of stigma are compounded because discrimination is often internalized. Cooley's framework of the looking glass self theorizes that people define and evaluate themselves in response to how others perceive and respond to them in social interactions.[34] This framework has been used to examine social implications of obesity.[35] Obesity, a stigmatized attribute, may result in negative social feedback internalized as negative self-concepts, lower self-confidence, and poorer social development. The effects of obesity are long-lasting and very difficult to reverse.[36]

TABLE 1—Descriptive Characteristics of Third-Grade Children: United States, Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999

Variable	Mean or % (SE)
Gender	
Female	49.89 (0.009)
Male	50.11 (0.009)
Race/ethnicity	
White	60.53 (0.018)
Black	13.36 (0.010)
Hispanic	19.19 (0.014)
Asian/Pacific Islander	3.38 (0.003)
American Indian	1.44 (0.009)
Multiracial	2.14 (0.003)
Age, y	9.102 (0.004)
Physical activity	
No sports	24.78 (0.009)
Individual sports only	10.51 (0.006)
Group sports only	27.58 (0.010)
Both group and individual sports	37.14 (0.010)
Parents in household	
Mother and father	60.90 (0.011)
Mother only	21.08 (0.009)
Mother and stepfather	10.79 (0.007)
Adopted	4.30 (0.005)
Father only	1.82 (0.003)
Father and stepmother	1.09 (0.002)
Mother works full time	48.39 (0.010)
Maternal depression	23.93 (0.009)
SES quintile	
1 (Lowest)	17.86 (0.010)
2	19.78 (0.009)
3	20.63 (0.008)
4	20.79 (0.007)
5	20.94 (0.010)

Note. SES = socioeconomic status. Data were from the 2002 third-grade wave, adjusted to represent the US population of children who entered kindergarten and first grade in 1998 and 1999. Sample size for this analysis was n = 8346.

POTENTIAL IMPACT OF SOCIAL COMPETENCE ON OBESITY

Although obesity may lead to lower social competence, it is also possible that low social competence increases the chances of becoming overweight or obese. Children with low social competence may be shy, prefer the company of adults, or avoid engaging in activities with classmates. They may be victimized and stigmatized because of their poor social skills, and they may exclude themselves from social situations. This could result in more time spent being inactive or eating—for example, watching television and finding solace for loneliness in calorie-rich foods. Among children and adolescents aged 8 to 18 years, those who felt victimized by their peers were less likely to engage in physical activity[2] and showed higher preference for sedentary and isolated activities.[25] Social stress and isolation are associated with unhealthy eating, binge eating, and obesity.[13,14] Through solitary, sedentary activities and unhealthy eating, low social competence may lead to weight gain over time.

Previous research has investigated the social consequences of obesity among adolescents,[10,37] but little work has focused on younger children, who are in crucial stages of developing basic social skills.[18] We used data from the nationally representative Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999 (ECLS-K) to explore the relationship between children's body weight and their social competence in elementary school. Specifically, we examined (1) whether obesity is associated with subsequent decreases in social competence and (2) whether lower social competence is associated with subsequent progression to obesity.

METHODS

The ECLS-K, developed by the National Center for Education Statistics, followed a nationally representative cohort of children from kindergarten through eighth grade. The survey comprised interviews with parents, teachers, and principals; one-on-one direct assessments of children; and interviews with children.[38] The ECLS-K is the only nationally representative longitudinal survey with objectively measured height and weight, collected twice per wave by trained assessors,[39] avoiding the bias of other large studies, which rely on reported weight and height.[40]

Data

Our sample consisted of the 8346 children who participated through the fifth-grade data collection wave and had complete information on relevant variables. Our analyses focused on the third- and fifth-grade waves, which assessed self-reported social competence. The survey measured children's self-assessed social competence with an adaptation of the Self-Description Questionnaire-I, originally designed to measure self-concept across multiple domains, including peer relationships, in children aged 8 to 12 years.[41] The questionnaire is one of the most validated self-concept measures for preadolescents[42]; the ECLS-K adapted it for and validated it in a US population.[43] Because the instrument was designed

TABLE 2—Social Competence and Weight in Third and Fifth Grades: United States, Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999

Variable	Third Grade, Mean or % (SE)	Fifth Grade, Mean or % (SE)
Weight category		
Normal (including underweight)	66.96 (0.009)	61.01 (0.010)
Overweight	19.84 (0.007)	24.49 (0.008)
Obese	13.20 (0.002)	14.49 (0.006)
Became overweight or obese, third to fifth grade	. . .	11.96 (0.007)
Social competence		
Scale, 1–4	3.03 (0.012)	2.98 (0.012)
Decreased, third to fifth grade	. . .	46.72 (0.009)
Increased, third to fifth grade	. . .	41.87 (0.009)

Note. Data were from the 2002 third-grade wave and the 2004 fifth-grade wave and were adjusted to represent the US population of children who entered kindergarten and first grade in 1998 and 1999. Sample size for this analysis was n = 8346.

TABLE 3—Linear Regression Coefficients for Change in Self-Assessed Social Competence Between Third and Fifth Grade: United States, Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999

Variable	ΔSocial Competence (SE)
Weight Category	
Normal (Ref)	1.000
Overweight	−0.010 (0.032)
Obese	0.038 (0.034)
Gender	
Male (Ref)	1.000
Female	0.041 (0.023)
Race	
White (Ref)	1.000
Black	0.054 (0.051)
Hispanic	−0.008 (0.042)
Asian/Pacific Islander	−0.023 (0.080)
American Indian	−0.094 (0.103)
Multiracial	−0.003 (0.076)
Age, mo	−0.004 (0.006)
SES quintile	
1 (Lowest; Ref)	1.000
2	0.021 (0.059)
3	0.084 (0.059)
4	0.054 (0.051)
5	0.137* (0.058)
US region	
Northeast (Ref)	1.000
Midwest	−0.046 (0.040)
South	−0.026 (0.041)
West	−0.007 (0.042)
Urbanicity	
City	
Suburban or town	0.023 (0.030)
Rural	−0.018 (0.035)
Parents in household	
Mother and father	
Mother and stepfather	0.028 (0.046)
Father and stepmother	−0.047 (0.094)
Mother only	−0.062* (0.031)
Father only	−0.042 (0.126)
Adopted	−0.039 (0.078)

Continued

for this specific age range, the ECLS-K only collected these measures in the third- and fifth-grade waves.[42]

To examine social competence, we used data from the ECLS-K Self-Description Questionnaire peer relationships scale, which assessed 6 items pertaining to children's socialization: "I have lots of friends," "I make friends easily," "I get along with kids easily," "I am easy to like," "Other kids want me to be their friend," and "I have more friends than most other kids." Children responded to a degrees-of-truth scale (1–4: "not at all true," "a little bit true," "mostly true," "very true"). The measure was used by previous studies to capture self-concept and social competence.[44,45] The α coefficient for the Self-Description Questionnaire peer relationships scale was 0.79 for the ECLS-K third-grade wave and 0.82 for the fifth-grade wave.[43] The ECLS-K computed an average composite score (range = 1–4), which we used for analysis.

We used the 2000 Centers for Disease Control and Prevention Growth Reference to calculate each child's body mass index (BMI; defined as weight in kilograms divided by the square of height in meters) *z* score, standardized to the reference population for the child's age and gender.[46] We used cutoffs for normal weight, overweight, and obese from the Child Obesity Working Group of the International Obesity Task Force.[47] The task force used large, nationally representative data sets from 6 countries to create these cutoffs, and they correspond to adult BMI cutoff points of less than 25 for normal weight, 25 to 29.99 for overweight, and 30 or higher for obese.

Our models included characteristics that may be associated with obesity or social competence: gender, race/ethnicity, age (in months), and physical activity participation (none, individual sports, group sports, both individual and group sports). We also included characteristics of the family that may affect social development and health behaviors[48,49]: socioeconomic status quintiles created by the ECLS-K,[38] parental coresidence (both biological parents, mother only, father only, mother and stepfather, father and stepmother, adopted), mother's employment status (full time, not full time), mother's depression, US region, and urbanicity (urban area, suburban or large town, rural area or small town).

Analyses

We used ECLS-K survey adjustments to maintain the nationally representative nature of the data across 2 waves of data collection. After descriptive analyses, we examined whether weight in third grade was associated with change in social competence between third and fifth grade, with change in self-assessed social competence as the continuous dependent variable in linear regressions (change = social competence in fifth grade − social competence in third grade). The exposure variable was the trichotomous weight variable (normal, overweight, obese) in third grade, with adjustment for our control variables.

Then, we examined whether social competence in third grade was associated with change in weight between third and fifth grade in 3 multinomial logistic regressions. In the first model, we examined children who were normal weight in third grade to determine their likelihood of either remaining normal weight (referent category), becoming overweight, or becoming obese. The second model examined children who were overweight in third grade and either became normal weight, remained overweight (referent category), or became obese. The third model considered children who were obese in third grade and either became normal weight, became overweight, or remained obese (referent category). In all 3 models, the exposure variable was the social competence score in third grade. We tested all models for interaction by gender, but we reported combined results because of a lack of effect modification.

RESULTS

Table 1 shows survey-adjusted characteristics of third graders (mean age = 9.1 years): 20% of children were overweight and 13% were obese. When they were in fifth grade (mean age = 11.1 years), 24% were overweight and 14% obese (Table 2). Children who were overweight or obese in third grade had lower social competence scores than children who were normal weight ($P < .01$), and the cross-sectional negative association remained significant in the fifth grade ($P < .01$; results not shown). Between third and fifth grade, 12% of children increased in weight category from normal weight to overweight or obese, or from overweight to obese.

The distribution of social competence scores was right-skewed, with an average of 2.99. On

TABLE 3—*Continued*

Mother works full time	–0.000 (0.028)
Maternal depression	0.014 (0.032)
Physical activity	
No sports	
Individual sports only	–0.007 (0.045)
Group sports only	0.079* (0.037)
Both group and individual sports	0.084* (0.033)
Constant	0.199 (0.627)

Note. SES = socioeconomic status. Data were from the 2002 third-grade wave and the 2004 fifth-grade wave, and the model was adjusted for all variables as shown. Sample size for this analysis was n = 8346.
*P < .05; **P < .01; ***P < .001.

average, children decreased slightly in self-assessed social competence between third and fifth grade (mean change = –0.05; range = –3.0–+2.67), consistent with existing evidence that children often become more self-critical with age.[42] We observed considerable individual variation: 47% of children decreased, 11% maintained, and 42% increased their self-assessed social competence scores between third and fifth grade (Table 2).

Effect of Weight on Social Competence

Weight category (normal, overweight, obese) in third grade was not significantly associated with change in self-assessed social competence between third and fifth grade (Table 3). Results were robust to alternative specifications, such as adjustment for social competence in third grade, examination in logistic models of differing increments of change in social competence (i.e., any change, change > 1 SD), exclusion and separation of underweight children, and use of BMI *z* score for weight status in linear models.

Although weight status was not associated with subsequent social competence, several other third-grade characteristics were. Compared with children living with both biological parents, children living with their mother only experienced a significant decrease in social competence between third and fifth grade (–0.06; P < .05; Table 3). Children in the highest socioeconomic status quintile experienced a significant increase in social competence relative to those in the lowest quintile (0.14; P < .05), and children who played either group sports or a combination of group and individual sports experienced a statistically significant increase in social competence relative to children who did not play any sports (0.08; P < .05).

Effect of Social Competence on Weight

Social competence was negatively associated with subsequent increases in weight (Table 4). For every additional unit of social competence in third grade, the odds of shifting from normal weight to overweight between third and fifth grade were 20% lower (odds ratio [OR] = 0.80 ±0.09; P < .05) and the odds of shifting from normal weight to obese were 80% lower (OR = 0.20 ±0.08; P < .05). Among children who were overweight in third grade, for each additional unit of social competence, the likelihood of becoming obese by fifth grade was approximately 40% lower (OR = 0.59 ±0.11; P < .01). Social competence was not associated with the odds of overweight children becoming normal weight. Among children who were already obese in third grade, higher social competence was associated with higher likelihood of healthy weight change: children who had 1 unit higher social competence increased their likelihood of shifting from obese to overweight by approximately 40% (OR = 1.43 ±0.25; P < .05). Again, social competence was not associated with achieving normal weight.

The association between social competence in third grade and subsequent weight status remained significant in alternative models, including linear regression predicting BMI *z* score in fifth grade from social competence in third grade (P < .01), with adjustment for BMI *z* score in third grade and other covariates; logistic regressions with overweight–obese versus normal weight categories; and exclusion and separation of underweight children. Although results indicated possible racial/ethnic differences (Hispanic children might have shifted from normal to overweight differently than White children; Table A, available as a supplement to the online version of this article at http://www.ajph.org), cell sizes were not sufficient for full stratification by race/ethnicity, and the inclusion of interaction terms did not change the overall findings of the relationships between social competence and subsequent weight change.

DISCUSSION

We explored the relationships between body weight and social competence in childhood. Impaired social well-being and unhealthy weight often are found together, so we explored the possible direction of influence between social competence and weight. Lower social competence was associated with subsequent unhealthy weight gain, but obesity was not associated with subsequent decreases in social competence. These patterns suggest how these 2 conditions may come to coexist and how children's well-being may be improved on both fronts.

TABLE 4—Multinomial Logistic Odds Ratios for Associations Between Self-Assessed Social Competence in Third Grade and Change in Weight Category Between Third and Fifth Grade, by Weight Category in Third Grade: United States, Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999

	Fifth-Grade Children, OR (SE)		
Third-Grade Weight Category	Normal weight	Overweight	Obese
Normal (n = 5625)	. . .	0.796* (0.088)	0.203*** (0.077)
Overweight (n = 1636)	0.995 (0.182)	. . .	0.590** (0.107)
Obese (n = 1085)	0.891 (0.439)	1.43* (0.251)	. . .

Note. OR = odds ratio. Data were from the 2002 third-grade wave and the 2004 fifth-grade wave. Sample size for this analysis was n = 8346. Outcomes were odds of entering each weight category by fifth grade for children in each weight category in third grade. Social competence was measured on a 1–4 scale. Three survey-adjusted models controlled for gender, race/ethnicity, age, physical activity, parents in the household, maternal employment status, maternal depression, socioeconomic status quintile, urbanicity, and US region in third grade.
*P < .05; **P < .01; ***P < .001.

Low social competence was significantly associated with risk of unhealthy weight gain in subsequent years. Nine-year-old children with lower social competence were more likely to become overweight or obese by the time they were 11 years old. A possible explanation is that children with low social competence may be at higher risk for obesogenic behaviors, consistent with Goffman's framework of identity management.[33] Children with low social competence may engage in unhealthy behavior to avoid social situations in which they expect negative social feedback or to reduce the stress associated with negative social experiences. This could result in energy imbalance and weight gain if such responses take the form of solitary and sedentary activities or unhealthy eating behaviors. Although empirical evidence is limited, stress has been associated with increased caloric intake and weight gain in adults.[50] Future studies could consider whether children with low social competence are more likely to engage in comfort eating or spend more time in sedentary activities such as viewing television.

Another possible mechanism by which low social competence may relate to subsequent weight gain is that children who are not engaged with peers may be less receptive to cues about ideal body type, perhaps because they spend less time among peers or may be less skilled at interpreting—or less motivated by—social censure. To investigate whether social competence influences perceived social pressure toward the thin ideal and subsequent weight change, future investigations should include measurements of weight perceptions and perceived importance of body shape.

We did not find evidence that obesity leads to decreases in social competence. Obesity is well established as a stigmatizing and socially isolating trait,[51] and Cooley's model of the looking glass self suggests that the presence of obesity should negatively affect self-concept and self-confidence and therefore social competence.

Three possible explanations might account for the fact that obese children did not experience decreases in social competence. First, negative changes in social competence may occur nearly simultaneously in response to growing negative social feedback—real or imagined—as obesity develops, leading to the observed significant cross-sectional association rather than a longitudinal association linking obesity with future social competence. Second, it may be that the relationship between obesity and subsequent change in social competence is highly variable, depending on circumstances such as prevalence of obesity in a peer crowd, school, or neighborhood or even family perceptions and prejudices regarding obesity. For example, self-perceptions of overweight and desire for thinness vary across racial/ethnic groups.[52] Third, individual experiences of discrimination vary, and in some cases, a child might develop expanded social skills as a method of mitigating, or coping with, fat bias. Reactions to victimization include both internalizing (avoiding social situations) and externalizing (acting out) behaviors,[2] and a combination of responses may have contributed to the observed null findings.

Limitations

The available indicator of social competence focused on skill and success at socialization overall, rather than on individual aspects of social competence, so we were unable to explore the relative contributions of particular domains, such as communication or empathy. However, the measures included in the available composite, such as self-assessed ease of making friends, provided a valuable overall indicator of a child's perceived social success with his or her peers.

The data did not include information on children's depressive symptoms, which may play a role in development of obesity and social competence,[53,54] but we accounted for maternal depression, which has been linked with children's depression.[55] We were unable to explicitly account for puberty, which is associated both with body proportions and with social interactions, but the analyses partly addressed this variation by considering weight relative to the age- and gender-specific distributions. Finally, although we included a broad set of covariates in our models, other unmeasured factors, such as genetic influences or unobserved environmental characteristics, may be related to weight and social competence. Such factors merit further investigation.

Conclusions

Our data provided strong evidence that low social competence in elementary school is associated with increased risk of unhealthy weight gain. In light of the scope of childhood obesity in the United States and its health and social consequences,[56,57] factors that may contribute to obesity risks have considerable implications. Clarity about the relationship between weight and social competence could inform recommendations and interventions to promote children's social development and reduce obesity.

Although research is limited, some interventions, such as social skills training programs, have demonstrated success in increasing social competence.[58–60] With greater knowledge of programs to improve social competence among both normal weight and obese children, more nuanced approaches to childhood obesity could benefit both social and physical well-being. ■

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S. L. Jackson originated the study, conducted analyses, and drafted the article. S. A. Cunningham guided analysis and contributed to writing and editing the article.

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Human Participant Protection

No protocol approval was required because the study had no human participants.

References

1. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the United States, 2011–2012. *JAMA*. 2014;311(8):806–814.

2. Storch EA, Milsom VA, DeBraganza N, Lewin AB, Geffken GR, Silverstein JH. Peer victimization, psychosocial adjustment, and physical activity in overweight and at-risk-for-overweight youth. *J Pediatr Psychol*. 2007;32(1):80–89.

3. Young RD, Avdzej A. The effects of obedience/disobedience and obese/nonobese body type on social acceptance by peers. *J Genet Psychol.* 1979;134(1):43–49.

4. Faith MS, Leone MA, Ayers TS, Heo M, Pietrobelli A. Weight criticism during physical activity, coping skills, and reported physical activity in children. *Pediatrics.* 2002;110(2 pt 1):e23.

5. Strauss CC, Smith K, Frame C, Forehand R. Personal and interpersonal characteristics associated with childhood obesity. *J Pediatr Psychol.* 1985;10(3):337–343.

6. Strauss RS. Childhood obesity and self-esteem. *Pediatrics.* 2000;105(1):e15.

7. Friedlander SL, Larkin EK, Rosen CL, Palermo TM, Redline S. Decreased quality of life associated with obesity in school-aged children. *Arch Pediatr Adolesc Med.* 2003;157(12):1206–1211.

8. Ge X, Elder GH Jr, Regnerus M, Cox C. Pubertal transitions, perceptions of being overweight, and adolescents' psychological maladjustment: gender and ethnic difference. *Soc Psychol Q.* 2001;64(4):363–375.

9. Gortmaker SL, Must A, Perrin JM, Sobol AM, Dietz WH. Social and economic consequences of overweight in adolescence and young adulthood. *N Engl J Med.* 1993;329(14):1008–1012.

10. Pearce MJ, Boergers J, Prinstein MJ. Adolescent obesity, overt and relational peer victimization, and romantic relationships. *Obes Res.* 2002;10(5):386–393.

11. Helgeson VS, Escobar O, Siminerio L, Becker D. Relation of stressful life events to metabolic control among adolescents with diabetes: 5-year longitudinal study. *Health Psychol.* 2010;29(2):153–159.

12. Torres SJ, Nowson CA. Relationship between stress, eating behavior, and obesity. *Nutrition.* 2007;23(11–12):887–894.

13. Moore CJ, Cunningham SA. Social position, psychological stress, and obesity: a systematic review. *J Acad Nutr Diet.* 2012;112(4):518–526.

14. Zaitsoff SL, Fehon DC, Grilo CM. Social competence and social-emotional isolation and eating disorder psychopathology in female and male adolescent psychiatric inpatients. *Int J Clin Health Psychol.* 2009;9(2):219–228.

15. Newcomb AF, Bagwell CL. Children's friendship relations: a meta-analytic review. *Psychol Bull.* 1995;117(2):306–347.

16. Meisels SJ, Atkins-Burnett S, Nicholson J. *Assessment of Social Competence, Adaptive Behaviors, and Approaches to Learning With Young Children.* Washington, DC: National Center for Education Statistics, US Department of Education; 1996. Working paper 96–18.

17. Hubbard JA, Coie JD. Emotional correlates of social competence in children's peer relationships. *Merrill-Palmer Q.* 1994;40(1):1–20.

19. Collins WA. *Development During Middle Childhood: The Years From Six to Twelve.* Washington, DC: National Academies Press; 1984.

20. Collins WA, van Dulmen M. The significance of middle childhood peer competence for work and relationships in early adulthood. In: Huston, AC, Ripke MN, eds. *Developmental Contexts in Middle Childhood: Bridges to Adolescence and Adulthood.* New York, NY: Cambridge University Press; 2006:23–40. *Cambridge Studies in Social and Emotional Development.*

21. Erwin P. *Friendship in Childhood and Adolescence.* New York, NY: Routledge; 1998.

22. Ueno K. The effects of friendship networks on adolescent depressive symptoms. *Soc Sci Res.* 2005;34(3):484–510.

23. Vaquera E, Kao G. Do you like me as much as I like you? Friendship reciprocity and its effects on school outcomes among adolescents. *Soc Sci Res.* 2008;37(1):55–72.

24. Walker HM, Stieber S. Teacher ratings of adolescent social skills: psychometric characteristics and factorial replicability across age-grade ranges. *School Psych Rev.* 1991;20(2):301–314.

25. Hayden-Wade HA, Stein RI, Ghaderi A, Saelens BE, Zabinski MF, Wilfley DE. Prevalence, characteristics, and correlates of teasing experiences among overweight children vs. non-overweight peers. *Obes Res.* 2005;13(8):1381–1392.

26. Dietz WH. Health consequences of obesity in youth: childhood predictors of adult disease. *Pediatrics.* 1998;101(3 pt 2):518–525.

27. Crosnoe R, Muller C. Body mass index, academic achievement, and school context: examining the educational experiences of adolescents at risk of obesity. *J Health Soc Behav.* 2004;45(4):393–407.

28. Musher-Eizenman DR, Holub SC, Miller AB, Goldstein SE, Edwards-Leeper L. Body size stigmatization in preschool children: the role of control attributions. *J Pediatr Psychol.* 2004;29(8):613–620.

29. Cramer P, Steinwert T. Thin is good, fat is bad: how early does it begin? *J Appl Dev Psychol.* 1998;19(3):429–451.

30. Goldfield A, Chrisler JC. Body stereotyping and stigmatization of obese persons by first graders. *Percept Mot Skills.* 1995;81(3 pt 1):909–910.

31. Staffieri JR. A study of social stereotype of body image in children. *J Pers Soc Psychol.* 1967;7(1 pt 1):101–104.

32. Lerner RM, Korn SJ. The development of body-build stereotypes in males. *Child Dev.* 1972;43(3):908–920.

33. Goffman E. *Stigma: Notes on the Management of Spoiled Identity.* London, UK: Penguin Books Ltd; 1963.

34. Cooley CH. *Human Nature and the Social Order.* New York, NY: Charles Scribner's Sons; 1902.

35. Crosnoe R. Gender, obesity, and education. *Sociol Educ.* 2007;80(3):241–260.

36. Granberg EM. "Now my 'old self' is thin": stigma exits after weight loss. *Soc Psychol Q.* 2011;74(1):29–52.

37. Adams RE, Bukowski WM. Peer victimization as a predictor of depression and body mass index in obese and non-obese adolescents. *J Child Psychol Psychiatry.* 2008;49(8):858–866.

38. Tourangeau K, Nord C, Lê T, Pollack JM, Atkins-Burnett S. *ECLS-K: Combined User's Manual for the ECLS-K Fifth-Grade Data Files and Electronic Codebooks.* Washington, DC: National Center for Education Statistics; 2006. NCES 2006–032.

39. *User's Manual for the ECLS-K Base Year Public-Use Data Files and Electronic Codebook.* Washington, DC: US Department of Education; 2004. NCES 2001-029 (revised).

40. Bogaert N, Steinbeck KS, Baur LA, Brock K, Bermingham MA. Food, activity and family–environmental vs biochemical predictors of weight gain in children. *Eur J Clin Nutr.* 2003;57(10):1242–1249.

41. Marsh HW. *Self-Description Questionnaire Manual.* Campbelltown, Australia: University of Western Sydney; 1990.

42. Atkins-Burnett S, Meisels SJ. *Measures of Socio-emotional Development in Middle Childhood.* Washington, DC: US Department of Education, National Center for Education Statistics; 2001.

43. Pollack JM, Atkins-Burnett S, Najarian M, Rock DA. *Early Childhood Longitudinal Study, Kindergarten Class of 1998–99, Psychometric Report for the Fifth Grade.* Washington, DC: National Center for Education Statistics; 2005. NCES 2006–036.

44. Kang Y-S. *The Role of Religious Socialization in Asian Families for Children's Self-Perceived Early Academic Success and Social Competence* [dissertation]. Boston, MA: Northeastern University; 2010.

45. Walston J, Rathbun AH. *Children's Self-Report About Their Social-Emotional Development From Third to Fifth Grade: Findings From the ECLS-K.* Chicago, IL: American Educational Research Association; 2007.

46. Vidmar S, Caelin J, Hesketh K, Cole T. Standardizing anthropometric measures in children and adolescents with new functions for egen. *Stata J.* 2004;4(1):50–55.

47. Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ.* 2000;320(7244):1240–1243.

48. Wight VR, Price J, Bianchi SM, Hunt BR. The time use of teenagers. *Soc Sci Res.* 2009;38(4):792–809.

49. Schmeer KK. Family structure and obesity in early childhood. *Soc Sci Res.* 2012;41(4):820–832.

50. Roberts CJ. The effects of stress on food choice, mood and bodyweight in healthy women. *Nutr Bull.* 2008;33(1):33–39.

51. Tang-Péronard JL, Heitmann BL. Stigmatization of obese children and adolescents, the importance of gender. *Obes Rev.* 2008;9(6):522–534.

52. Boyd EM, Reynolds JR, Tillman KH, Martin PY. Adolescent girls' race/ethnic status, identities, and drive for thinness. *Soc Sci Res.* 2011;40(2):667–684.

53. O'Shea G, Spence SH, Donovan CL. Interpersonal factors associated with depression in adolescents: are these consistent with theories underpinning interpersonal psychotherapy? *Clin Psychol Psychother.* 2013; Epub ahead of print.

54. Goodman E, Whitaker RC. A prospective study of the role of depression in the development and persistence of adolescent obesity. *Pediatrics.* 2002;110(3):497–504.

55. Zimmer KP, Minkovitz CS. Maternal depression: an old problem that merits increased recognition by child healthcare practitioners. *Curr Opin Pediatr.* 2003;15(6):636–640.

56. Dentzer S. The child abuse we inflict through child obesity. *Health Aff (Millwood).* 2010;29(3):342.

57. Katz JR, Taylor NF, Goodrick S, Perry L, Yudkin JS, Coppack SW. Central obesity, depression and the hypothalamo-pituitary-adrenal axis in men and postmenopausal women. *Int J Obes Relat Metab Disord.* 2000;24(2):246–251.

58. Suárez M. Promoting social competence in deaf students: the effect of an intervention program. *J Deaf Stud Deaf Educ.* 2000;5(4):323–333.

59. Kasari C, Rotheram-Fuller E, Locke J, Gulsrud A. Making the connection: randomized controlled trial of social skills at school for children with autism spectrum disorders. *J Child Psychol Psychiatry.* 2012;53(4):431–439.

60. Reichow B, Steiner AM, Volkmar F. Cochrane review: social skills groups for people aged 6 to 21 with autism spectrum disorders (ASD). *Evid Based Child Health.* 2013;8(2):266–315.