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Optimism and the SES Gradient in Adolescent Adiposity

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Abstract

Purpose—To assess if dispositional optimism is associated with adiposity and explore if dispositional optimism mediates the relationship between parent education and adiposity (BMI z score).

Methods—Multivariable regression analyses of data collected from 1298 non-Hispanic black and white 12–19 year olds from a single Midwestern public school district.

Results—Less optimistic adolescents had higher BMI z scores ($r = -0.09$, $p < 0.001$). Addition of dispositional optimism to the regression model caused an approximately 10% attenuation of the parent education and BMI z score relationship. Sobel tests confirmed that this attenuation indicated partial mediation.

Conclusion—Lower dispositional optimism is associated with higher adiposity and this association accounts for some of the influence of parent education on adolescent adiposity.

Keywords

Socioeconomic status; disparities; dispositional optimism; body mass index; adiposity

Introduction

Adolescents and adults from households with lower socioeconomic status (SES) have higher rates of obesity [1]. There is a growing body of evidence that suggests psychological factors play a role in the development of obesity. Thus, psychological factors may partially underlie the SES gradient in adolescent obesity. One such psychological trait is dispositional optimism, the tendency to expect positive outcomes and believe good things will happen in life, hereafter referred to as “optimism” [2]. Studies, mostly in adults, suggest that optimism is associated with several health outcomes, including some linked to obesity [3, 4]. Fewer studies have explored the optimism-health link in adolescence [5] or its relationship to health disparities, although lower SES youth have been shown to be less optimistic [6]. This study extends prior work by exploring the relationship between optimism and adiposity and assessing if optimism mediates the established SES-adiposity relationship.

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Methods

Study Sample

This cross-sectional study utilizes data from 1298 non-Hispanic black and white participants in the PSD Study, a longitudinal cohort study in the greater Cincinnati area. Inclusion criteria were baseline (2001–2002 school year) information on optimism, height, weight, and parent education [6]. The Institutional Review Boards at the participating university and local children's hospital approved all study procedures. Optimism was assessed using the Life Orientation Test (LOT), a scale validated for use in adolescents[7]. Parent education as reported by a parent/guardian, a measure less dynamic than income, was used to indicate SES. Analysis categories were: high school or less, some college or vocational training, college graduate, and professional degree. Professional degree was used as the reference group in regression models. Measured height and weight were used to calculate BMI (kg/m^2)[1]. BMI z-scores were derived from Centers for Disease Control and Prevention growth chart standards and used in analyses. Obesity was defined as a BMI-for-age>= 95%, and overweight as BMI-for-age >=85% but less than the 95%. Pubertal status (prepubertal, peripubertal, postpubertal) was assessed according to a validated protocol [8]. Date of birth, gender, and parent-identified race/ethnicity were abstracted from school district administrative data.

Statistical Analysis

Prior work established the relationships between SES and optimism and SES on adiposity [1,6]. To evaluate whether optimism is associated with adiposity and whether optimism mediates the SES-adiposity relationship, we performed bivariate analyses (correlational, ANOVA) and multivariable linear regression analyses adjusted for age, sex, race, and pubertal status. Sobel testing confirmed whether the difference in the regression coefficients for parent education without and with optimism in the model represented mediation. Analyses were performed using PASW Statistics 18, Release Version 18.0 (© SPSS, Inc., 2009, Chicago, IL, www.spss.com) except for the Sobel tests, which were performed using an interactive online mediation test calculator [9]. Means are presented with standard deviation (SD).

Results

Table 1 presents the demographics of the study sample. Less optimistic adolescents had higher BMI z-scores($r = -0.09$, $p < 0.001$) and optimism was lower among overweight and lowest for obese youth (μ_{obese} =18.4(SD3.9), $\mu_{overweight}$=1837(3.7) $\mu_{normal\ weight}$=19.3(3.9), p=0.002) compared to normal weight youth. In multivariable regression analysis, the inverse association between optimism and BMI-z score remained after adjusting for covariates (β= −002, $p < .01$).

To test if optimism mediated the SES-adiposity relationship, we verified the association between parent education and both optimism and adiposity established in prior studies [1,6]. Adolescents from households with lower parent education were less optimistic than adolescents from households with professional degrees, and this relationship followed a graded pattern (high school or less [$\beta = -1.13$, $p < 0.001$], some college [$\beta = -0.90$, $p < 0.001$]), college graduates ($\beta = -0.25$, NS). Likewise, youth from families with highly educated parent(s) had lower BMI z-scores. We then assessed the change in coefficients for parent education with optimism in the regression model. The figure presents the regression results without and with optimism in the model. Sobel testing revealed that the differences in regression coefficients between these two models were significant for the lower two

education categories (high school or less p=0.019, some college p =0.029, college graduates p=0.38).

Discussion

This study demonstrates that optimism, a psychological trait, is inversely associated with adolescent adiposity and that optimism partially mediates the lower parent education-greater adiposity relationship. Adolescents from households with lower parent education tend to be less optimistic and this lower degree of optimism explains some of the disparity in BMI. Furthermore, these data suggest that having a parent with a college degree or higher may be a threshold for conferring a protective effect in terms of adolescent optimism and adiposity.

By demonstrating that optimism is one path through which SES may exercise its influence on adiposity, this study makes an important contribution to the growing literature on social inequalities and health. Adolescent adiposity predicts the risk of becoming obese and developing cardiovascular disease as an adult [10]. By demonstrating an association between lower optimism and increased adiposity in adolescence, this study suggests that lower optimism may be one pathway through which these negative health outcomes manifest later in life.

This study has several limitations. Analyses were cross-sectional, so we cannot infer causality. However, parent education is generally static and temporally precedes the development of optimism and obesity. Similarly, because optimism is a trait that develops early in life[2], it likely also precedes the development of adolescent adiposity. Parent education was the single measure of SES. A different marker, such as income, may show different results. Finally, this sample is from a single predominantly non-Hispanic black and white Midwestern school district. These findings may not generalize to other populations. Nonetheless, this sample has important strengths; it was a large, socioeconomically diverse, gender-balanced, community-based cohort with measured information on adiposity. Future work with geographically and ethnically diverse samples may increase generalizability.

Implications and Contributions

By evaluating the mediating role of optimism in the relationship between parent education and adolescent adiposity, this study provides support for the mind-body link as a contributor to the development of health disparities and highlights the importance of looking beyond physical environmental and behavioral factors in the genesis of health disparities.

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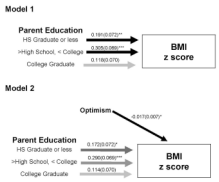

Figure.

Results of multivariable regression analyses used in testing for mediation for the SES-adiposity relationship by optimism (N = 1298). B (SE) are presented along the relevant paths. Model 1 tested the association of parent education adjusting for age, race/ethnicity, sex and pubertal status. Model 2 added optimism to the regression model. Model 1 Adjusted R^2=0.048. Model 2 Adjusted R^2=0.051. *P < .05,**P < .01,***P <.001

Table 1

Description of the Study Sample (N = 1298)

	N	%
Gender		
Male	636	49.0
Female	662	51.0
Race		
White	691	53.2
Black	607	46.8
Pubertal Status		
Prepubertal	29	2.2
Peripubertal	428	33.0
Postpubertal	839	64.6
Missing	2	0.2
Parent Education		
High School or less	319	24.6
> High School, < college	370	28.5
College Graduate	339	26.1
Professional Degree	270	20.8
Weight Status		
Normal Weight	780	60.1
Overweight	251	19.3
Obese	267	20.6
	Mean	**Standard Deviation**
Age	15.24	1.66
Optimism	19.01	3.87
BMI z score	.74	1.02