Neighborhood Disorganization and Weight: Structural Factors Affecting Adolescent Obesity

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Introduction

- Child and adolescent obesity is a national health concern (Wang and Beydoun 2007; Must and Strauss 1999). Much of the prevention rhetoric is focused on individual diet and exercise behaviors. A sociological perspective provides a better understanding, recognizing that social and structural factors may limit individual choice.
- A right-skewed shift in the bell curve of child and adolescent weight distribution suggests an increase in cases of both obesity and severe obesity over time (Must and Strauss 1999).
- The purpose of this study is to examine associations between neighborhood disorganization and adolescent obesity and identify mechanisms that mediate those relationships.

Prior Research

- Neighborhood poverty has been linked with adolescent obesity (Wickrama et al. 2006; Lee et al. 2009).
- Neighborhood violent crime has been associated with inactivity, possibly through the mechanism of parents encouraging indoor – therefore sedentary – play (Richmond et al. 2007).
- High neighborhood poverty has been found to be associated with a greater availability of fast-food restaurants (Richardson et al. 2012).
- Within census tracts with the highest risk for childhood obesity, the average poverty rate is 32.0%, 4 times the poverty level of tracts with average or below average risk for childhood obesity (Long et al. 2007).
- Family poverty, especially in early life, is a risk factor for childhood and adolescent obesity (Lee et al. 2014).

Present Study

- Research Question: How do Neighborhood Disadvantage and Social Disorganization Affect Adolescent Obesity?
- Social organization within a neighborhood is referring to resident's common expectations and values and their engagement with one another.
  - When residents share expectations and values, informal social controls are maintained, which prevent crime (Shaw and McKay 1942; Sampson et al. 1999).
  - Social organization is measured by racial composition, residential turnover, and concentration of poverty (Shaw and McKay 1942; Sampson et al. 1999).
- Social organization should serve as a protective factor against adolescent obesity, while disorganization will put individuals at risk.
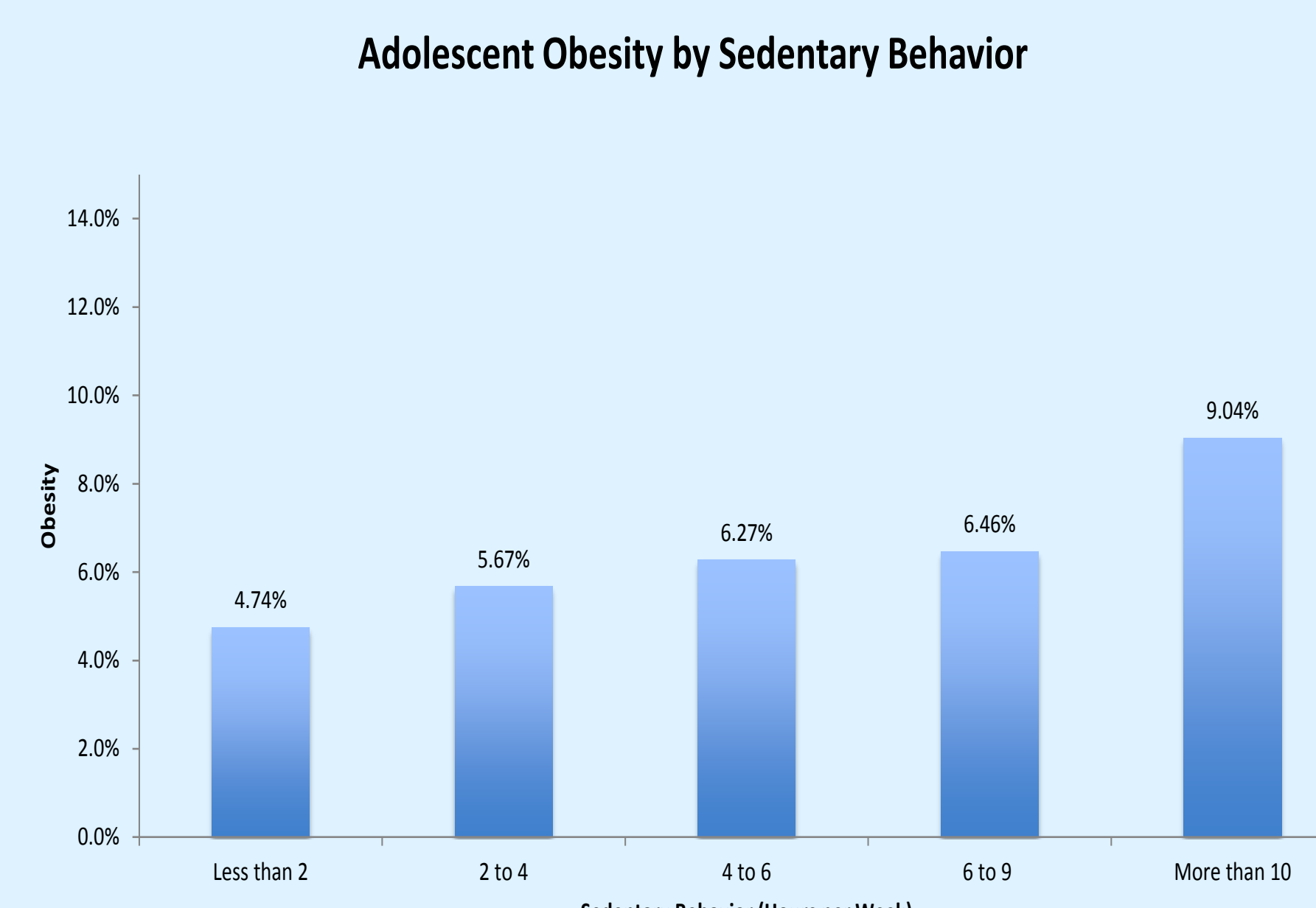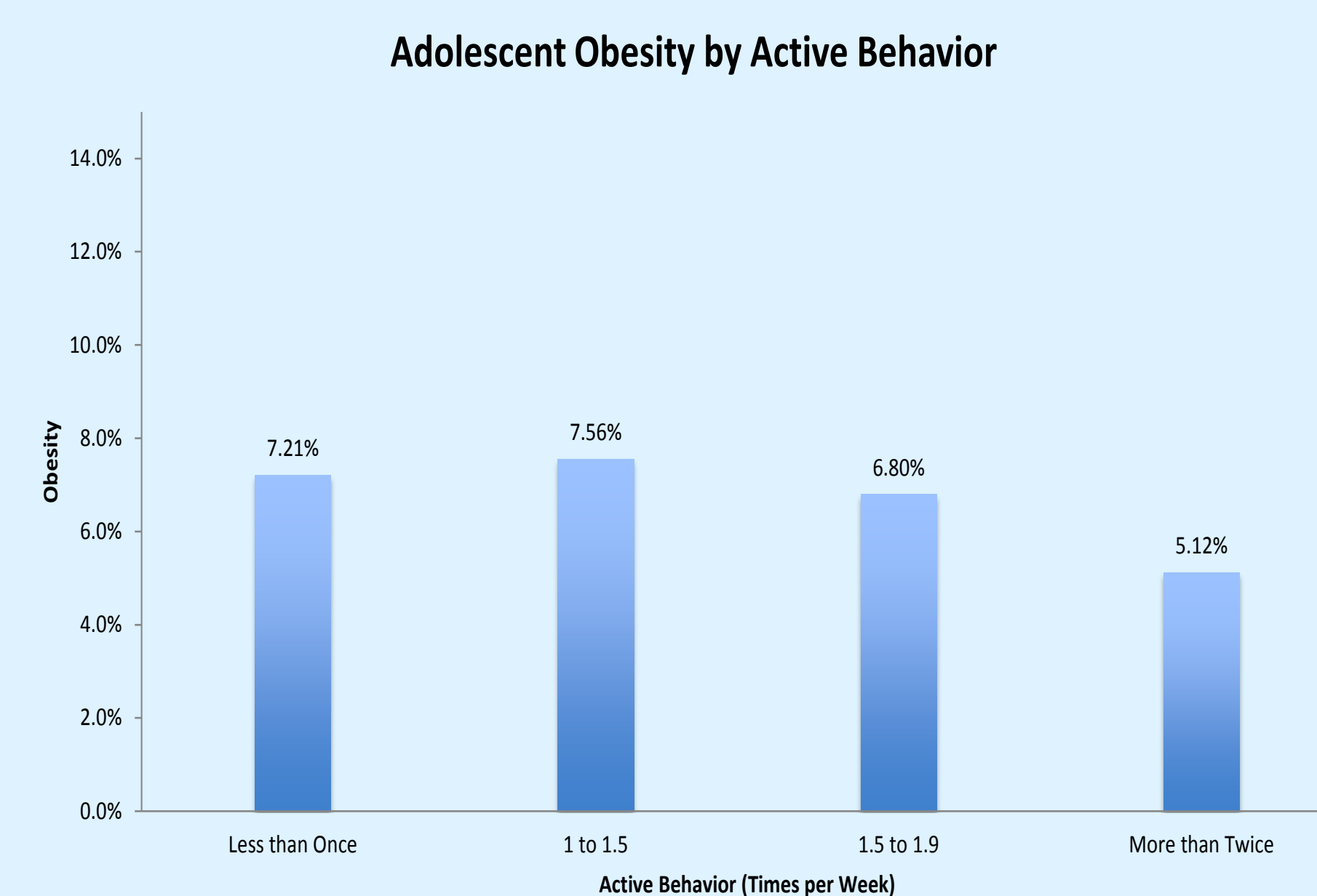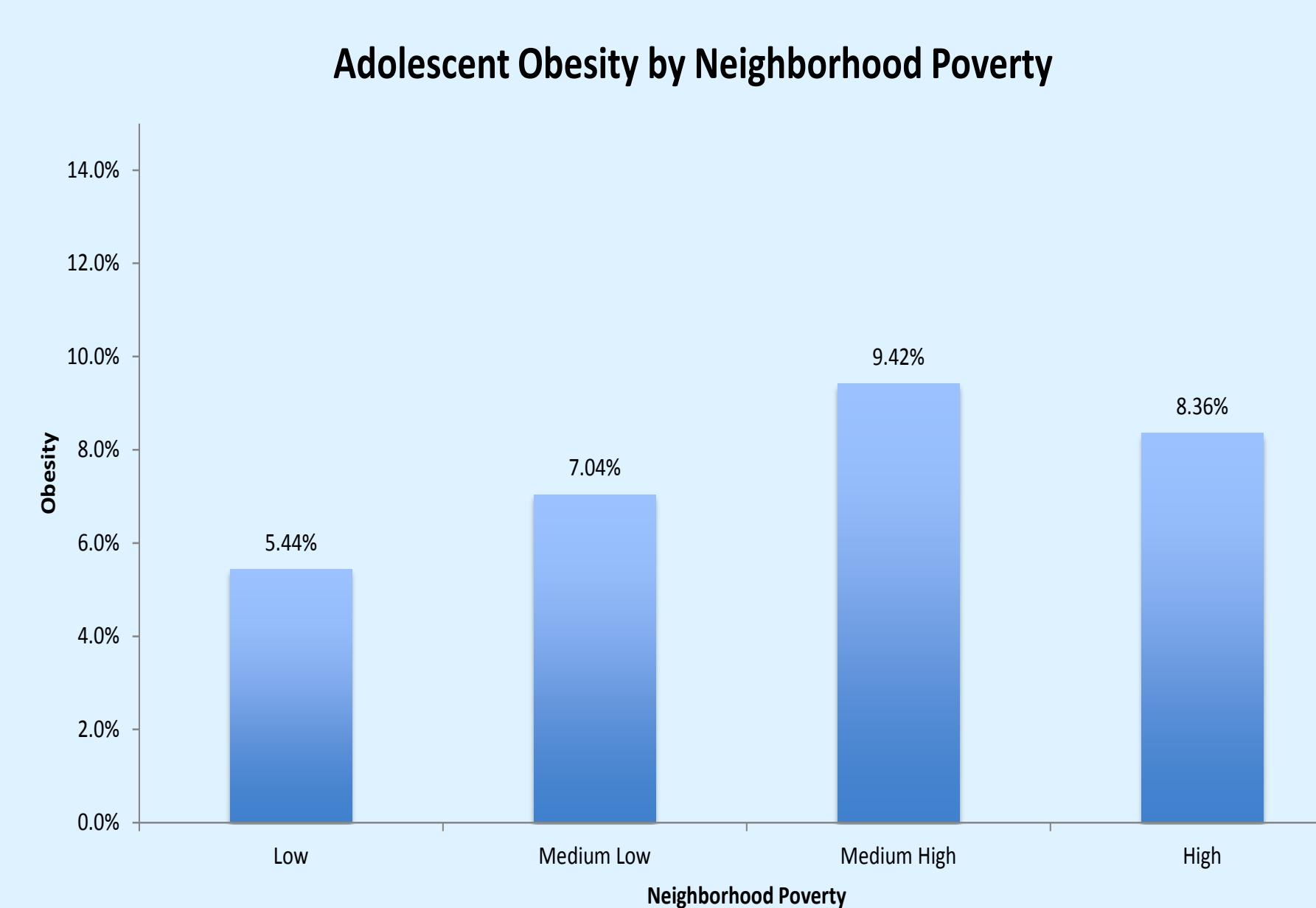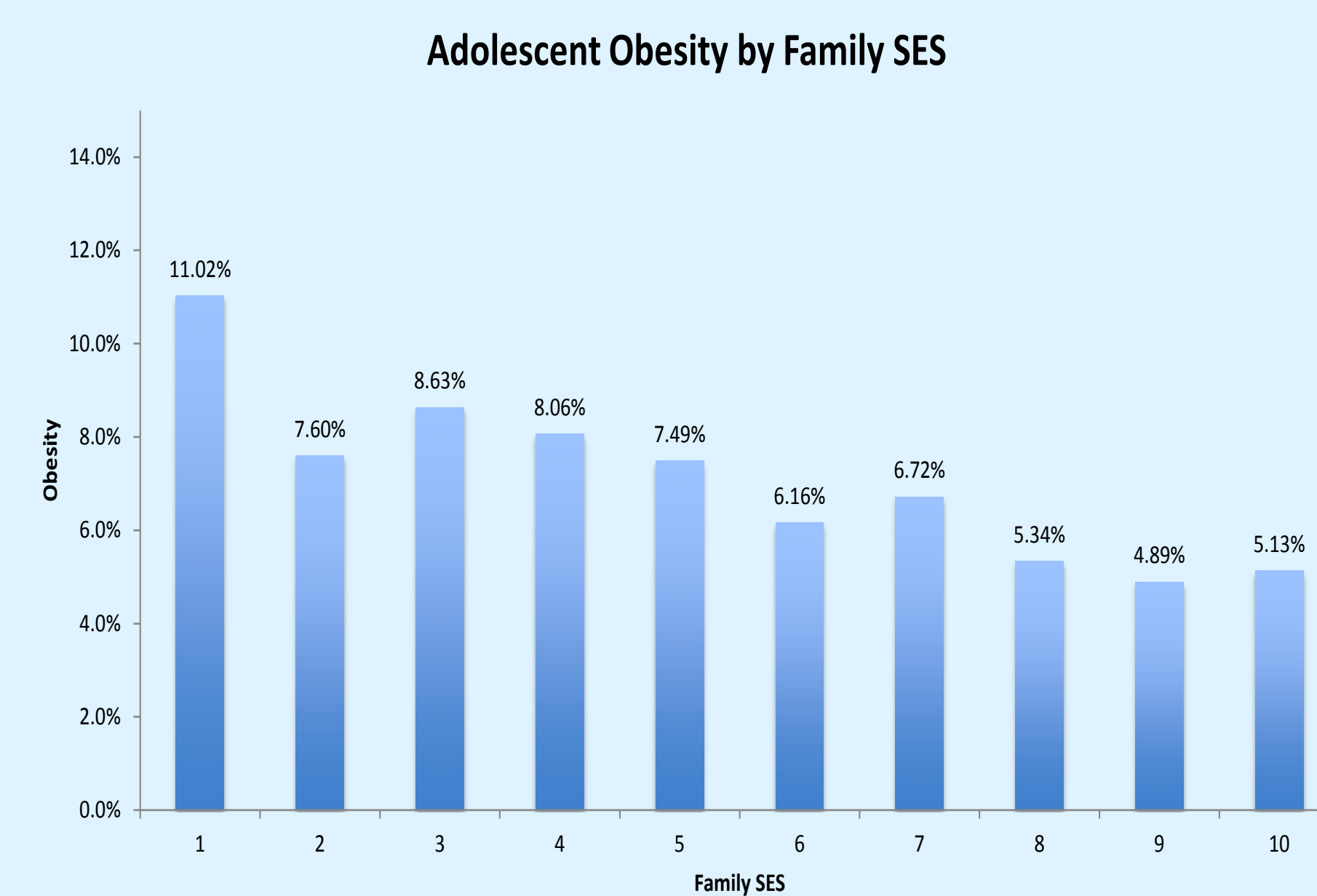
ADD Health

- Data was drawn from the National Longitudinal Study of Adolescent Health (ADD Health) Waves I (1995) & II (1996).
  - ADD Health provides information on adolescent health and wellbeing among a nationally representative sample tracked over time, along with a contextual dataset that contains information on the social environment from the 1990 Census.
- 13,719 respondents were used for the analysis.

Data & Measures

- Dependent Variable (Wave II): Body Mass Index (BMI) ratio of weight to height
  - Individuals with a BMI of 30 or greater are considered obese
    - Underweight BMI <18.5   39.0% of total sample
    - Normal BMI >18.5 and <25   43.4% of total sample
    - Overweight BMI >25 and <30   10.9% of total sample
    - Obese BMI $\geq$30   6.7% of total sample

- Independent Variables (Wave I):
  - Active Behaviors: Mean of reported times per week performing housework, playing sports, or actively playing
  - Sedentary Behaviors: Mean of reported hours per week spent watching videos, watching TV, and playing video games
  - Collective Efficacy Scale: Mean of respondent's reported connectivity to neighbors
  - Neighborhood Poverty: Proportion persons with income in 1989 below poverty level
  - Turnover: Proportion of population 5 years and older living in the same house as 1985
  - Racial Heterogeneity: Neighborhood racial diversity

- Control Variables:
  - Family SES
  - Family Composition
  - Age
  - Race/Ethnicity
  - Gender

Adolescent Obesity by Family SES

Adolescent Obesity by Neighborhood Poverty

Adolescent Obesity by Active Behavior

Adolescent Obesity by Sedentary Behavior

Multivariate Regression Model for Adolescent Obesity

Variable	Parameter Estimate	Standard Error
Age	0.351 **	0.027
Living with Two Biological Parents	0.089	0.089
Family SES	-0.089 **	0.017
Female	-0.117	0.086
Black	0.480 *	0.129
Asian	-0.646 *	0.192
Hispanic	0.412 *	0.136
Other	0.411	0.328
Activity Scale	-0.206 *	0.074
Sedentary Scale	0.032 **	0.006
Health Education Scale	1.038 **	0.162
Collective Efficacy Scale	0.088	0.136
Perceptions of Neighborhood Safety	0.070	0.138
Neighborhood Poverty	2.277 **	0.400
Neighborhood Residential Turnover	1.526 **	0.362
Neighborhood Racial Heterogeneity	0.627 *	0.191

*   Indicates statistical significance at p<.05
** Indicates statistical significance at p<.0001

Findings

- Structural factors: Higher levels of neighborhood poverty, residential turnover, and racial heterogeneity were found to have statistically significant associations with an increase in adolescent BMI.
- Individual level factors:
  - Higher levels of sedentary behaviors were found to have statistically significant associations with an increase in adolescent BMI.
  - Higher levels of family SES and active behaviors were found to have statistically significant associations with a decrease in adolescent BMI.

Conclusion

- Structural factors influence adolescent BMI above and beyond individual behaviors.
- Future research will examine adolescent access to healthy food choices and sedentary play in the the context of neighborhood disorganization.
- Future policy and prevention efforts should consider both individual behaviors and structural factors.